Alliance Geotechnical

Engineering | Environmental | Testing

Supplementary Contamination Assessment
Lot 3991 in DP1190132

Jordan Springs Boulevard, Jordan Springs, NSW

Prepared for: LLRL Management Services Pty Ltd as Trustee
of LLRL Management Services Trust

Report Number: 7161-ER-1-3
Report Date: 20 April 2018

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DOCUMENT CONTROL

Revision	Date	Author	Authorised
Rev 0	20 April 2018	Jake Walker / Craig Cowper	Craig Cowper

EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by LLRL Management Services Pty Ltd as trustee of LLRL Management Services Trust, to undertake a supplementary contamination assessment for a parcel of land located at Jordan Springs Boulevard, Jordan Springs, NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- a supplementary contamination assessment is required to provide updated information on site suitability for the proposed low to medium density residential land use setting for the site;
- the site was the subject of a site audit statement in 1999, which confirmed the site was suitable for a residential land use setting; and
- the assessment needs to consider the suitability of 5 small soil stockpiles located on site, for reuse on site.

The objectives of this project 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 the proposed land use setting;
- provide recommendations for further investigation, management and/or remediation (if warranted).

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

- a limited desktop review;
- a site walkover;
- limited soil sampling and laboratory analysis; and
- data assessment and reporting.

Within the context and objective of this project, an area of environmental concern (AEC) and contaminants of potential concern (COPC) have the potential to be present on site. The AEC identified are presented in attached **Figure 3** and associated COPC are presented in the table below.

ID	AEC	Land Use Activity	Contaminants of Potential Concern
AEC01	Combined stockpiles located adjacent to the carpark (<20m^3)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.
AEC02	Stockpile located in north eastern portion (<20m^3)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.
AEC03	Nine stockpiles located adjacent to western boundary (~10m^3 each)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the assessment objectives and current commercial / industrial land use setting, AG makes the following conclusions:

- the contamination status of the broader site is considered unlikely to have materially changed since the issue of a site audit statement in 1999;

- the concentrations of identified contaminants of potential concern in stockpile SP01 and SP02 are considered unlikely to present an unacceptable direct contact human health exposure risk;
- the concentrations of identified contaminants of potential concern in stockpile SP01 and SP02 are considered unlikely to present an unacceptable inhalation / vapour intrusion human health exposure risk;
- stockpile SP01 (in AEC01) would be suitable (in the context of human health and land contamination) for beneficial reuse on site;
- the estimated concentration of bonded asbestos in soil detected in AEC02 (stockpile SP02), may present an unacceptable human health exposure risk and unacceptable aesthetics risk;
- chemical contaminants of concern, asbestos fines and friable asbestos in AEC03 (stockpiles SP03, SP04, SP05, SP06, SP07, SP08, SP09, SP10 and SP11) require further investigation, to assess whether they may present an unacceptable human health exposure risk;
- the site could be made suitable for the proposed land use setting (in the context of land contamination), subject to:
  - management and/or remediation of bonded asbestos in stockpile SP02;
  - further assessment, management and/or remediation of potential unacceptable human health exposure risks in SP03, SP04, SP05, SP06, SP07, SP08, SP09, SP10 and SP11;
  - ongoing implementation of the URS 2008, 'Contamination Management Plan, Western Precinct Development Phase' dated 7 July 2008, ref: 4321 7287, as recommended in the site audit statement issued for the sites; and
- Further assessment, management and/or remediation planning works should be undertaken by a suitably experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 14**.

1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by LLRL Management Services Pty Ltd as trustee of LLRL Management Services Trust, to undertake a supplementary contamination assessment for a parcel of land located at Jordan Springs Boulevard, Jordan Springs, NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

AG has the following project appreciation:

- a supplementary contamination assessment is required to provide updated information on site suitability for the proposed low to medium density residential land use setting for the site;
- the site was the subject of a site audit statement in 1999, which confirmed the site was suitable for a residential land use setting; and
- the assessment needs to consider the suitability of 5 small soil stockpiles located on site, for reuse on site.

1.2. Objectives

The objectives of this project 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 the proposed land use setting;
- provide recommendations for further investigation, management and/or remediation (if warranted).

1.3. Scope of Work

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

- a limited desktop review;
- a site walkover;
- limited soil sampling and laboratory analysis; and
- data assessment and reporting.

2. SITE IDENTIFICATION

The site is identified as Lot 3991 in DP1190132.

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were 33°43'45" S and 150°43'23" E.

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

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

The site covers an area of approximately 3.633 hectares.

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

3. SITE HISTORY AND LAND USE

3.1. Aerial Imagery

A review of selected historical aerial imagery of the site was undertaken. Imagery back to 2002 was reviewed, for the purpose of making an assessment of potential land contaminating activities being undertaken on the site, since issue of a site audit statement for the site in 1999. Observations made of the imagery considered relevant to this project, are presented in **Table 3.1**.

Table 3.1: Aerial Imagery Observations

Image Date	Site Features	Surrounding Land Use Settings
2002 Google Earth	Site appears primarily undeveloped and vegetated with a mix of trees, shrubs and grasses. A vehicle roadway appears to pass through the northern portion of the site.	Surrounding land is generally vacant
2006 Google Earth	No significant change from previous image.	No significant change from previous image.
2007 Google Earth	No significant change from previous image.	No significant change from previous image.
2009 Nearmap	No significant change from previous image.	No significant change from previous image.
2010 Nearmap	No significant change from previous image.	No significant change from previous image.
2011 Nearmap	The roadway passing through the northern portion of the site, while still present, appears to have been replaced by the alignment of the current Jordan Springs Boulevard. A square shaped excavation is apparent in the north eastern corner of the site, adjacent to the current Jordan Springs Boulevard. It appears to be associated with civil works being undertaken for the alignment of Jordan Springs Boulevard.	Low density residential development to the north.
2012 Nearmap	There are two circular features in the immediate vicinity of the square excavation observed in the 2011 image. There is a minor unsealed road in the north eastern corner of the site, potentially providing access for earthworks activities to the east of the site.	Civil earthworks to the east of the site.
2013 Nearmap	A square shaped asphalt car park (similar to current) is present adjacent to the central northern portion of the site, with access via Jordan Springs Boulevard.	Ongoing civil earthworks to the east of the site.

Image Date	Site Features	Surrounding Land Use Settings
2014 Nearmap	No significant change from previous image.	Lakeside Parade to the east of the site has been constructed. Commercial development to the north of the site (likely to be a shopping centre).
2015 Nearmap	No significant change from previous image.	No significant change from previous image.
2016 Nearmap	No significant change from previous image.	No significant change from previous image.
2017 Nearmap	Unsealed access road on the site, which appears to provide access to the drainage infrastructure being constructed to the south of the site.	Drainage infrastructure construction works to the south.

The aerial imagery review did not indicate a significant potential for land contaminating activities to have been undertaken at the site, between 2002 and 2017. These observations should be considered when assessing other historical information identified during this project and site walkover observations.

3.2. Anecdotal Information

There was no anecdotal information provided to AG during this project.

3.3. Incident Reports

There were no incident reports relevant to the site provided to AG during the project.

3.4. Complaints History

There was no complaints history provided to AG during the project.

3.5. Previous Contamination Assessments

A copy of the following report was made available to AG during this project:

- URS 2008, 'Contamination Management Plan, Western Precinct Development Phase' dated 7 July 2008, ref: 4321 7287.

- Douglas Partners 2017, 'Site Walkover Contamination Report, Proposed Lots 3989, 3990 and 3991, DP1190132, Jordan Springs, NSW', dated 21 September 2017, ref: 92245.00

A summary of these reports is presented in **Section 3.5.1** and **3.5.2** of this report, and a copy of URS (2008) and Douglas Partners (2017) is presented in **Appendix B** of this report.

3.5.1. URS (2008)

The objective of URS (2008) was to provide a framework for identifying and addressing any discovery of chemical contamination or potentially explosive ordnance so as to ensure a safe working environment for workers during development and to avoid unacceptable impact on the nature environment.

URS (2008) was prepared for a parcel of land referred to as the Western Precinct. AG understands the Western Precinct fell within the former Australia Defence Industries (ADI) facility in St Marys.

An assessment by AG of Figure 2 in URS (2008) indicated that the subject site falls within the south western corner of the Western Precinct.

Section 1.2 of URS (2008) noted that the majority of the Western Precinct was assessed by a NSW EPA Accredited Site Auditor (Site Auditor), to pose a negligible risk to the public or the environment with regard to chemical contamination and/or explosive ordnance. A number of site audit statements (SASs) for parcels of land across the Western Precinct are included in Appendix A of URS (2008).

URS (2008) noted that:

- unexpected finds may occur in areas which, although searched extensively, contain remnant materials which were obscured by the local topography, the type of surface cover (e.g. building) or at a depth preventing detection; and
- the Site Auditor considered that, while explosive ordnance may be uncovered during earthworks, it is unlikely that these will present an unacceptable risk provided appropriate procedures for the safe handling and disposal of such material are adopted.

A copy of a Site Audit Statement (SAS), prepared by the Site Auditor (Mr Christopher Kidd of HLA-Envirosciences), dated 7 June 1999, reference CHK001/1 was presented in Appendix A of URS (2008). An assessment of the SAS by AG indicated that the subject site fell within the boundaries of the land that SAS CHK001/1 applied to. AG also found that the SAS certified that land as suitable for residential, including substantial vegetable garden and poultry, residential with minimal, opportunity for soil access including units, day care centre, preschool, primary schools, secondary school, park, recreational open space, playing field and commercial / industrial land use settings, subject to a number of conditions, including:

- the exclusion of specific parcels of land, as marked on the plan attached to the SAS; and
- an appropriate management plan, including procedures for the safe handling and disposal of any items of ordnance that may be found during earthworks, being lodged prior to the commencement of development earthworks

AG assessed the plan attached to the SAS and considered that:

- the subject site did not appear to fall within the shaded areas excluded from SAS CHK001/1; and
- land located immediately adjacent to the subject site, did not appear to fall within the shaded areas excluded from SAS CHK001/1.

3.5.2. Douglas Partners (2017)

The objective of Douglas Partners (2017) was to identify additional activities or sources that have occurred/appeared on site since the sale of the property in June 2013.

The scope of work undertaken to address the project objective included a document review and site walkover.

Douglas Partners (2017) reported the following conclusions, considered relevant to the subject Lot 3990 and Lot 3991:

- Limited review of historical aerial imagery and site walkover completed on 19 September 2017, identified the following potential sources appearing onsite in recent years that have the potential for contamination of the site:
    - Five small stockpiles or soil observed on the unsealed area immediately adjacent to the south eastern corner of the asphalt carpark on Lot 3991. Given the small volume (15-20m^3) of the stockpiles, likely origins from bulk earthworks associated with the nearby carpark and observed contents, the soil within the stockpiles poses a low contamination risk to the site.

Douglas Partners (2017) recommended that:

- further investigations be completed within the soil stockpiles on Lot 3991, to confirm the absence/presence of contaminants of potential concern associated with fill of an unknown origin; and

- the recommended further assessment should build on the information presented in Douglas Partners (2017) with reference to NEPC (1999) and should include intrusive investigation, sampling and analysis.

4. REGULATORY RECORDS

4.1. NSW EPA CLM Act Record of Notices

A search of the publicly available online NSW EPA CLM Act Record of Notices was undertaken on 6 April 2018. The results indicated that the site was not the subject of any notifications under Section 58 of the *Contaminated Land Management Act 1997*.

A copy of the CLM Act Record of Notices search record is presented in **Appendix C**.

4.2. NSW EPA POEO Act Register of Licences, Applications and Notices

A search of the publicly available online NSW EPA Record of Notices was completed on 6 April 2018. The results indicated that the site was not the subject of any licences, applications, notices, audits or pollution studies or reduction programs under Section 308 of the *Protection of the Environment Operations Act 1997*.

A copy of the POEO Act Register of Licences, Applications and Notices search record is presented in **Appendix C**.

4.3. NSW EPA CLM Act Register of Notified Sites

A search of the publicly available online register of sites notified to the NSW EPA under Section 60 of the *Contaminated Land Management Act 1997*, was undertaken on 6 April 2018. The results indicated that the site was not listed on the register, nor were any properties located on adjacent land.

4.4. Section 149 Planning Certificate

Obtaining a copy of the planning certificate issued for the site under Section 149 of the Environmental Planning and Assessment Act was not within the scope of this project.

4.5. SafeWork NSW Stored Chemical Information Database (SCID)

A search of Safe Work NSW stored chemical information database (SCID) was not undertaken for the site. A review of recent historical aerial imagery site did not indicate a significant potential for licensable quantities of dangerous goods to have been stored on the site. The availability of a site audit statement for the site, also suggests that if licensable quantities of dangerous goods had been historically stored at the site, potential contamination risks associated with that storage would have been addressed during investigation and potential remediation / validation works for the broader parcel of land that the site is a part of.

AG considers that further assessment of storage of licensable quantities of dangerous goods on the site is not warranted.

5. GEOLOGY, ACID SULFATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

5.1. Geology

A review of the Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1) 1983, indicated that the site is likely to be underlain by Middle Triassic, Wianamatta Group, Bringelly Shale, defined as shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff.

5.2. Acid Sulfate Soils

The Australian Soil Resource Information System website (http://www.asris.csiro.au/mapping/viewer.htm) indicates that the site is in an area mapped as 'Extremely Low Probability / Low Confidence', with respect to acid sulfate soils.

Further assessment of acid sulphate soils in the context of this project is considered by AG as not warranted.

5.3. Topography

The site topography was generally flat, with some minor localised undulations, and some south east facing slopes.

A detail and level survey indicated that the site surface was located at an elevation of approximately 42m Australian Height Datum (AHD) in the north west, to approximately 35m AHD in the south east.

5.4. Hydrogeology

Surface water courses proximal to the site include an unnamed dam/lake located adjacent to central western boundary of the site, and a small dam located adjacent to the eastern boundary of the site. The Penrith Lakes precinct is located approximately 2.5km to the west of the site, and the Nepean River is located approximately 4km to the west of the site. South Creek is located approximately 3.6km to the east of the site, with minor tributaries to South Creek located between the site and South Creek.

A review of the NSW Office of Water groundwater database (www.http://allwaterdata.water.nsw.gov.au/water) indicated there were no registered groundwater features within a 500m radius of the site.

A copy of the NSW Office of Water search record is presented in **Appendix D**.

6. SITE WALKOVER

A site walkover was undertaken on 9 April 2018 by a suitably experienced AG environmental consultant (Mr Craig Cowper). The purpose of the site walkover was to make observations of land use activities on the site, and on properties immediately adjacent to the site.

6.1. Current Land Use Activity

There did not appear to be any land use activities being undertaken on the site at the time of the site walkover.

6.2. Buildings and General Infrastructure

There was an asphaltic paved car park located in the northern portion of the site. There was visual evidence observed of unsealed vehicle tracks across the site, located primarily in the northern and south eastern portion of the site. Lesser defined unsealed vehicle tracks were also observed in the western portion of the site.

Visual evidence of one groundwater monitoring wells was observed in the north eastern corner of the site, and two groundwater monitoring wells in the south western corner of the site.

The remainder of the site appeared to be vacant.

Image 6.2.1 View of asphalt car park in northern portion of the site

Image 6.2.2 View of north eastern portion of site

Image 6.2.3 Example of unsealed vehicle tracks on the site

Image 6.2.4 View of groundwater monitoring well in north eastern corner of the site

Image 6.2.5 View of two groundwater monitoring wells (PVC and metal) in south western corner of the site

6.3. Boundary Fencing

The site boundary was generally fenced along the northern and eastern boundaries.

6.4. Adjacent Land Use Activities

Observations made during the site walkover indicated the following land use activities adjacent to the site:

- North - Jordan Springs Boulevard then residential;
- East - Lakeside Parade, then vacant land;
- West - vacant land; and
- South - vacant land towards the south west, and drainage infrastructure to the south east.

6.5. Odours and Staining

There was no olfactory evidence of odours or visual evidence of staining observed on the surface of the site, during the site walkover.

6.6. Chemical Storage

There was no visual evidence observed of chemical storage on the site.

6.7. Underground and Aboveground Storage Tanks

There was no visual evidence observed of underground or aboveground storage tanks on the site.

6.8. Filling Material

There was no visual evidence to suggest the presence of significant or widespread filling at the site.

Observations were made of approximately five small soil stockpiles (joined together and labelled as SP01 by AG) located adjacent to the south eastern corner of the asphalt carpark. The combined stockpiles were partially vegetated. Observations made in the field by AG indicated an estimated volume of <20m3 of material.

Observations were made of a stockpile in the north eastern corner of the site (labelled as SP02 by AG). The stockpile was partially vegetated. Observations made in the field by AG indicated an estimated volume of <20m^3 of material.

Observations were made of nine stockpiles located towards the western boundary of Lot 3991 (labelled as SP03 to SP11) by AG. The stockpiles were estimated in the field to be approximately 10m^3 each in volume. Visual observations of the stockpiles indicated they were comprised of clay, sand, sandstone and building waste.

Observations were also made of one earth bund style feature in the south eastern portion of the site. The bund appeared to have been put in place to divert overland surface water. Observations made of the surfaces of the bund, and the land surface adjacent to the bund (which included depressions adjacent to the bund), indicated that the bund was formed using borrowed material from the depressions, rather than imported fill material. The soils observed on the surface of the bund were comparable to what appeared to be naturally occurring soils on the surface adjacent to the bund, and there was no visual evidence of anthropogenic materials observed on the surface of the bund.

Image 6.8.1 View of stockpile SP01 adjacent to asphalt carpark

Image 6.8.2 View of stockpile SP02 adjacent to north eastern boundary

Image 6.8.3 View of stockpile SP03 adjacent to western boundary of the site

Image 6.8.4 View of stockpile SP04 adjacent to western boundary of the site

Image 6.8.5 View of stockpile SP05 adjacent to western boundary of the site

Image 6.8.6 View of stockpile SP06 adjacent to western boundary of the site

Image 6.8.7 View of stockpile SP07 adjacent to western boundary of the site

Image 6.8.8 View of stockpile SP08 adjacent to western boundary of the site

Image 6.8.9 View of stockpile SP09 adjacent to western boundary of the site

Image 6.8.10 View of stockpile SP10 adjacent to western boundary of the site

Image 6.8.11 View of stockpile SP11 adjacent to western boundary of the site

Image 6.8.14 View of earth bund in south eastern portion of the site

6.9. Wastes

There was no visual evidence observed of significant wastes being stored inappropriately on the site. Observations were made of isolated occurrences of empty glass/plastic bottles and other domestic style refuse.

6.10. Asbestos Containing Materials

There was no visual evidence observed of potential asbestos containing materials on the surface of the site, with exception of fragments of fibrous cement sheeting (FCS) observed on the surface of the nine stockpiles reported in Section 6.8.

Image 6.10.1 View of example of fragment of FCS on surface of stockpile on site

Image 6.10.2 View of example of fragment of FCS on surface of stockpile on site

Image 6.10.3 View of example of fragment of FCS on surface of stockpile on site

Image 6.10.4 View of example of fragment of FCS on surface of stockpile on site

A hazardous building materials survey was not within the scope of this project.

6.11. Phytotoxicity

There was no visual evidence observed to suggest significant or widespread phytotoxic impact (in the form of dieback or plant stress) in vegetation at the site. Similar observations were made of visible vegetation on land adjacent to the site.

6.12. Site Drainage

Visual observations made in the context of site drainage during the walkover, indicated that drainage mechanisms on the site are likely to include:

- surficial overland flow following localised site topography; and
- infiltration into underlying soils, where soil permeability permits.

7. CONCEPTUAL SITE MODEL

7.1. Areas of Environmental Concern and Contaminants of Potential Concern

Within the context and objective of this project, an area of environmental concern (AEC) and contaminants of potential concern (COPC) have the potential to be present on site. The AEC identified are presented in attached **Figure 3** and associated COPC are presented in **Table 7.1**.

Table 7.1: AEC and COPC

ID	AEC	Land Use Activity	Contaminants of Potential Concern
AEC01	Combined stockpiles located adjacent to the carpark (<20m^3)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.
AEC02	Stockpile located in north eastern portion (<20m^3)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.
AEC03	Nine stockpiles located adjacent to western boundary (~10m^3 each)	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals and asbestos.

7.2. Land Use Setting

AG understands that the site is proposed for a residential land use setting.

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

7.3. Direct Contact – Human Health

The proposed land use setting is likely to include accessible soils. In these areas, it is considered that a direct contact exposure pathway may be complete.

7.4. 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).

The historical evidence reviewed indicated a low likelihood for a potential 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. On that basis, 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, and therefore does not warrant further assessment.

Potential sources of groundwater contamination in the immediate vicinity of the site (e.g. service stations) were not observed. A groundwater source of vapours was considered unlikely at the site.

Further assessment of the inhalation / vapour intrusion pathway is considered not warranted.

7.5. 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.

7.6. 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.

The potential presence of land contamination in the identified AEC, may create an aesthetics risk. Further assessment of this risk is considered warranted.

7.7. Ecological – 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 there was no visual evidence observed to suggest significant or widespread phytotoxic impact (in the form of dieback or plant stress) in onsite vegetation. Similar observations were made of visible vegetation on land adjacent to the site.

On this basis, AG considers further assessment of terrestrial ecosystems exposure risks, not warranted.

7.8. Groundwater

Assessment of contamination risks to groundwater, is not within the scope of this assessment. In the event that potential soil contamination is identified during this assessment, recommendations may be made for assessment of contamination risks to groundwater.

8. 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 8.1** to **8.7** of this report.

8.1. Step 1: State the problem

The first step involves summarising the contamination problem that requires new environmental data and identifying resources available to solve the problem.

The objectives of this project are 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 the proposed land use setting;
- provide recommendations for further investigation, management and/or remediation (if warranted).

The assessment is being undertaken because:

- a supplementary contamination assessment is required to provide updated information on site suitability for the proposed low to medium density residential land use setting for the site;
- the site was the subject of a site audit statement in 1999, which confirmed the site was suitable for a residential land use setting; and
- the assessment needs to consider the suitability of 5 small soil stockpiles located on site, for reuse on site.

The project team identified for this project is comprised primarily of suitably experienced environmental consultants from Alliance Geotechnical Pty Ltd.

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

8.2. 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 project include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- 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 for the proposed land use setting, in the context of land contamination?

8.3. 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 8.2 for this project, will include:

- the nature and extent of sampling at the site, including both density and distribution;
- samples of relevant site media;

- the measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); 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 7 of this project, the assessment criteria relevant to the proposed land use setting have been adopted for this project.

- 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); 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).

8.4. 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 timeframe presented in the AG proposal for this project,
- 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 the inferred base of the identified AEC.

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

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

8.5. 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.

8.5.1. 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).

8.5.2. 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 C_6-C_{10}).

8.5.3. 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.

8.5.4. 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.

8.5.5. If/Then Decision Rules

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

- 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 project; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this project (refer **Section 8.3**), 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 project (refer **Section 8.3**), 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.

8.6. 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 8.7.1**	Critical samples analysed according to SAQP	Refer **Section 8.7.6**
Critical samples collected	Refer **Section 8.7.1**	Analytes analysed according to SAQP	Refer **Section 8.7.6**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.6**
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 8.7.7**
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 8.7.7**
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer **Section 8.7.7**
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 8.7.7**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer Section 8.4	Samples analysed according to SAQP	Refer **Section 8.7.6**
Media identified in SAQP sampled	Refer Section 8.4		
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**

Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >20 times LOR	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

8.7. 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.

8.7.1. Sampling Point Density and Locations

Table 4 in NSW NEPC (1999b) provides guidance on stockpile sampling for initial assessment. Further to this, Section 6.2.1 of NEPC (1999b) states that the number and location or 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.

Section 7.5.2 of NEPC (1999b) also provides guidance on the quantity of samples to be collected form stockpiles.

Given the combined volume of material estimated in each of the identified AEC, and the guidance provided above, AG proposes to establish three sampling points in AEC01 and three sampling points in AEC02. While each of the stockpiles observed in AEC03 could potentially warrant establish three sampling points in each stockpile, AG considers the size of the stockpiles cannot be adequately assessed within the approved scope of this assessment[1], and that only preliminary sampling of fragments of FCS on the surface of each stockpile in AEC03 will be undertaken.

8.7.2. Sampling Methodology

The sampling point methodology presented in **Table 8.7.2** will be used for this assessment. The methodology is based on a range of factors considered relevant to this project, including:

- the identified contaminants of potential concern;
- the suspected laydown mechanisms for those contaminants of concern;
- the suspected likely depth of contamination; and
- site specific constraints which affect the type of sampling techniques suited to the site.

Table 8.7.2 Proposed Sampling Methodology

AEC	Sampling Point ID	Method	Target Depth of Sampling Point (m bgs)
AEC01	SP01/01 to 03	Hand tools	Minimum of 0.3m below surface of stockpiled material
AEC02	SP02/01 to 03	Hand tools	Minimum of 0.3m below surface of stockpiled material
AEC03	SP03/FCS to SP11/FCS	Hand tools	Surface fragments of fibrous cement sheeting

8.7.3. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number.

Project samples will be stored in laboratory prepared containers (and zip lock bags if collected for asbestos or acid sulfate soil assessment). Filled containers 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)

8.7.4. Decontamination

[1] Sampling would ideally require mechanical earth moving equipment, however, the approved assessment scope was limited to use of hand tools, and the stockpiles were not identified by AG until the day of fieldwork.

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.

8.7.5. Laboratory Selection

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

8.7.6. 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;
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history, AG has adopted the laboratory analytical schedule (and associated upper limiting quantities) presented in **Table 8.7.6** for this project.

Table 8.7.6 Laboratory Analytical Schedule

AEC	Sampling Point ID	TRH/BTEX	PAH	OCP	PCB	Metals	Asbestos (0.001%)	Asbestos ID
AEC01	SP01/01 to 03	3	3	3	3	3	3	3
AEC02	SP02/01 to 03	3	3	3	3	3	3	3
AEC03	SP03/FCS to SP11/FCS	-	-	-	-	-	-	9

8.7.7. 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 8.7.7**.

Table 8.7.7 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
VOC	14 days	USEPA 8260	0.1-0.5
PAH	14 days	USEPA 8270	0.1-0.5
OCP	14 days	USEPA 8081	0.2
PCB	14 days	USEPA 8270	0.2
Metals	14 days	USEPA 8015B & C	0.05 – 2
Asbestos	No limit	AS4964:2004	Absence / presence

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	Inhouse Method	0.001% w/w

9. FIELDWORK

9.1. Service Locating

Given the nature and methodology of the fieldwork planned for this project, underground service locating was not undertaken.

9.2. Soil Sampling

Soil sampling was undertaken by AG on 9 April 2018.

A total of 15 sampling points (SP01/01-03, SP02/01-0.3 and SP03 to SP11) were established on site. Each sampling point was established using hand tools, as appropriate.

The locations of the sampling points established on site, are presented in **Figure 4**.

Bulk soil samples were screened for the presence of potential asbestos containing materials (ACM) greater than 7mm in size. Potential ACM greater than 7mm was weighed and placed in separate zip lock bags. Bulk samples were not collected from SP03 to SP11 (refer **Section 8.7.1** for further information), however, samples of fibrous cement sheeting fragments observed on the surface of stockpiles SP03 to SP11, were collected to facilitate preliminary characterisation of these stockpiles.

Sub samples (500mL) of the bulk samples were also collected from SP01 and SP02.

Collected samples were placed in labelled laboratory supplied acid-rinsed glass jars (with Teflon lined lids) and zip lock bags.

9.3. Geology

Observations were made of materials encountered during sampling work. A summary of these observations is presented in **Table 9.3.**

Table 9.3 Geology

Sampling Point	Sample ID	Observations
SP01	01	Silty CLAY, brown, firm, moist, some claystone gravels, some concrete gravels, trace igneous cobble, nil odour/staining/potential asbestos containing materials observed. Duplicate DUP01 and triplicate DUP01A collected.
	02	Gravelly CLAY, brown, hard, dry, trace ironstone gravels, trace sandstone gravels, nil odour/staining/potential asbestos containing materials observed.
	03	Gravelly CLAY, brown, firm to hard, moist, trace concrete brick, tile and sandstone gravels, trace igneous cobbles, nil odour/staining/potential asbestos containing materials observed.
SP02	01	Clayey SILT, brown, moist, trace sandstone and shale gravels, trace plastic, organics nil odour/staining/potential asbestos containing materials observed.
	02	Clayey SILT, brown, moist, trace sandstone, shale and claystone gravels, nil odour/staining observed, one fragment of fibrous cement sheeting observed (10.3 grams)
	03	Clayey SILT, brown, moist, trace sandstone and shale gravels, organics, nil odour/staining/potential asbestos containing materials observed.

Sampling Point	Sample ID	Observations
SP03	FCS	Fragment of fibrous cement sheeting (33.6 grams)
SP04	FCS	Fragment of fibrous cement sheeting (42.1 grams)
SP05	FCS	Fragment of fibrous cement sheeting (10.6 grams)
SP06	FCS	Fragment of fibrous cement sheeting (21.5 grams)
SP07	FCS	Fragment of fibrous cement sheeting (31.9 grams)
SP08	FCS	Fragment of fibrous cement sheeting (8.3 grams)
SP09	FCS	Fragment of fibrous cement sheeting (54.8 grams)
SP10	FCS	Fragment of fibrous cement sheeting (20.5 grams)
SP11	FCS	Fragment of fibrous cement sheeting (38.9 grams)

9.4. Odours

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

9.5. Staining

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

10. LABORATORY

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 E**.

The sample analytical results were tabulated and presented in the attached **Table LAR1**, **Table LAR2** and **Table LAR3**.

11. DATA QUALITY INDICATOR ASSESSMENT

11.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 11.1**.

Table 11.1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	15	15	Performance against indicator considered acceptable.
Critical samples collected	15	15	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 SAQP	Refer **Section 8.7.6**	100%	Performance against indicator considered acceptable.
Analytes analysed according to SAQP	Refer **Section 8.7.6**	100%	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.7**	100%	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 8.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete.

11.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 11.2**.

Table 11.2 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 8.7.7**	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to SGS Environmental	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer **Section 8.7.7**	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable.

11.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 11.3**.

Table 11.3 Representativeness DQI

Field Considerations	**Target**	**Actual**	**Comment**
Appropriate media sampled according to SAQP	Refer **Section 8.7.2**	100%	Performance against indicator considered acceptable.
Media identified in SAQP sampled	Refer **Section 8.7.2**	100%	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Samples analysed according to SAQP	Refer **Section 8.7.6**	100%	Acceptable Performance against indicator considered acceptable.

The data collected is considered to be adequately representative.

11.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 11.4**.

Table 11.4 Precision DQI

Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	16.7% duplicates and 16.7% triplicates	Field duplicate DUP01 (parent sample SP01/01) had RPD exceedances for copper and zinc. Field duplicate DUP1A (parent sample SP01/01) had RPD exceedances for copper, nickel and zinc. AG considers these exceedances likely to be attributable to heterogeneity in each of the discrete soils 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. Performance against indicator considered acceptable.
	No limit for analytical results <10 times LOR	Nil	
	50% for analytical results 10-20 times LOR	Nil	
	30% for analytical results >20 times LOR	5 exceedances	
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	2 exceedances	SGS reported that the 2 laboratory duplicate exceedances in batch SE175866 failed RPD acceptance criteria due to sample heterogeneity. Performance against indicator considered acceptable.

The data collected is considered to be adequately precise.

11.5. Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 11.5**.

Table 11.5 Accuracy DQI

Field Considerations	Target	Actual	Comment
Rinsate blanks	Less than laboratory limit of reporting	Not applicable.	Disposable sampling equipment used for each sampling point. Rinsate blank not collected. Performance against indicator considered acceptable.
Field trip spikes	Recoveries between 60% and 140%	Recoveries between 60% and 140%	Performance against indicator considered acceptable.
Field trip blanks	Analyte concentration <LOR	Analyte concentration <LOR	Performance against indicator considered acceptable.
Laboratory Considerations	**Target**	**Actual**	**Comment**
Laboratory method blank	No exceedances of laboratory acceptance criteria	Nil	Acceptable
Matrix spike recovery	No exceedances of laboratory acceptance criteria	2 matrix spike recovery exceedances	SGS reported that the five matrix spike DQO exceedances in batch SE175866 failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeded the spike level). Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	Nil	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	Nil	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate.

12. DISCUSSION

A discussion on comparison of laboratory analytical results and field observations, in the context of the assessment criteria adopted for this project, is presented in **Sections 12.1** to **12.4**.

12.1. Human Health - Direct Contact

12.1.1. TRH

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

12.1.2. BTEX

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

12.1.3. PAH

The concentrations of naphthalene, benzo(a)pyrene TEQ and total PAH (16) detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

12.1.4. OCP

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

12.1.5. PCB

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

12.1.6. Metals

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

12.1.7. Bonded Asbestos Containing Materials

Fragments of fibrous cement sheeting (FCS) were encountered in AEC02 and AEC03. A total of 10 fragments of FCS were submitted for laboratory analysis for the presence of asbestos. Asbestos was identified in each of the samples analysed.

The gravimetric approach set out in Section 4.10 of NEPC (1999a) was used to assess asbestos in soil concentrations, including the assumed 15% asbestos by weight in cement bonded asbestos, and an assumed soil density of 1.65kg/L. These assumed values are considered to be adequately conservative within the context of this project, with the exception of soil density. The laboratory measured weights of 500mL sub samples collected from the 10L bulk samples across SP01 and SP02 indicated a soil density of closer to 1kg/L. Adopting a soil density of 1kg/L would produce a calculated % w/w asbestos in soil amount that is greater than if a soil density of 1.65kg/L was adopted. A soil density of 1kg/L is therefore considered adequately conservative in the context of this project for the purpose of comparing analytical results to adopted health screening levels (for SP01 and SP02). The sample size was 10L, based on guidance in Section 4.10 of NEPC (1999a).

As 10L bulk samples or 500mL sub samples were not collected from SP03 to SP11, AG considers it reasonable to adopt the published soil density guidance of 1.65kg/L, as a means of providing a preliminary assessment of estimated asbestos concentrations in soils for SP03 to SP11.

The estimation formula in Section 4.10 of NEPC (1999a) is:

$$\% \text{ w/w asbestos in soil} = \frac{\% \text{ asbestos content x bonded ACM (kg)}}{\text{soil volume (L) x soil density (kg/L)}}$$

The results of the calculations performed using this formula, are presented in **Table 12.1.7**.

Table 12.1.7 Results of Gravimetric Estimation of Asbestos Concentrations in Soil

Sample ID	Weight of Bonded ACM (kg)	% w/w Asbestos in Soil[2]
SP02/02-FRAG	0.0103	0.015
SP03/01-FCS	0.0336	0.031
SP04/01-FCS	0.0421	0.038
SP05/01-FCS	0.0106	0.010
SP06/01-FCS	0.0215	0.020
SP07/01-FCS	0.0319	0.029
SP08/01-FCS	0.0803	0.073
SP09/01-FCS	0.0548	0.050
SP10/01-FCS	0.0205	0.019
SP11/01-FCS	0.0389	0.035

The estimated concentrations of bonded asbestos in soil was not less than the adopted health screening level of 0.01% w/w, in each of the samples reported on, with the exception of sample SP05/01/FCS, which had a preliminary estimated asbestos concentration of asbestos in soil, equal to the adopted health screening level. Given the non-conventional sampling method for stockpile SP05, it is considered reasonable (and suitably conservative) to assume that, based on the presence of asbestos in the FCS sample, the potential for asbestos concentrations in SP05 to exceed to adopted health screening level should not be precluded.

12.1.8. Asbestos Fines and Friable Asbestos

The concentration of friable asbestos and asbestos fines (FA and AF) detected in the soil samples analysed from SP01 and SP02, were less than the applicable adopted health screening level.

The concentration of friable asbestos and asbestos fines (FA and AF) was not assessed for soils in SP03 to SP11.

12.2. Human Health – Inhalation / Vapour Intrusion (Soils)

12.2.1. TRH

The concentrations of TRH C_6-C_{10} (minus BTEX) and TRH >C_{10}-C_{16} (minus naphthalene) detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

[2] AG notes that the methodology adopted for estimation of asbestos concentration in soil for SP03 to SP11 is sufficiently conservative for providing preliminary advice on the presence of asbestos in the soils assessed.

12.2.2. 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.

12.2.3. PAH

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

12.3. TPH Management Limits (Residential)

The concentrations of TRH C_6-C_{10}, >C_{10}-C_{16}, >C_{16}-C_{34} and >C_{34}-C_{40} detected in the soil samples analysed, were less than the applicable adopted TRH management limits.

12.4. Aesthetics

There were no observations of odours, significant chemical deposits/wastes, large monolithic deposits of low risk material or putrescible waste in the soils sampled.

There were observations made of fragments of fibrous cement sheeting at sampling points SP02/02 and SP03, SP04, SP05, SP06, SP07, SP08, SP09, SP10 and SP11.

13. CONCLUSIONS

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the assessment objectives and current commercial / industrial land use setting, AG makes the following conclusions:

- the contamination status of the broader site is considered unlikely to have materially changed since the issue of a site audit statement in 1999;
- the concentrations of identified contaminants of potential concern in stockpile SP01 and SP02 are considered unlikely to present an unacceptable direct contact human health exposure risk;
- the concentrations of identified contaminants of potential concern in stockpile SP01 and SP02 are considered unlikely to present an unacceptable inhalation / vapour intrusion human health exposure risk;
- stockpile SP01 (in AEC01) would be suitable (in the context of human health and land contamination) for beneficial reuse on site;
- the estimated concentration of bonded asbestos in soil detected in AEC02 (stockpile SP02), may present an unacceptable human health exposure risk and unacceptable aesthetics risk;
- chemical contaminants of concern, asbestos fines and friable asbestos in AEC03 (stockpiles SP03, SP04, SP05, SP06, SP07, SP08, SP09, SP10 and SP11) require further investigation, to assess whether they may present an unacceptable human health exposure risk;
- the site could be made suitable for the proposed land use setting (in the context of land contamination), subject to:
    - management and/or remediation of bonded asbestos in stockpile SP02;
    - further assessment, management and/or remediation of potential unacceptable human health exposure risks in SP03, SP04, SP05, SP06, SP07, SP08, SP09, SP10 and SP11;
    - ongoing implementation of the URS 2008, 'Contamination Management Plan, Western Precinct Development Phase' dated 7 July 2008, ref: 4321 7287, as recommended in the site audit statement issued for the sites; and
- Further assessment, management and/or remediation planning works should be undertaken by a suitably experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 14**.

14. 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 project. 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.

15. REFERENCES

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'.

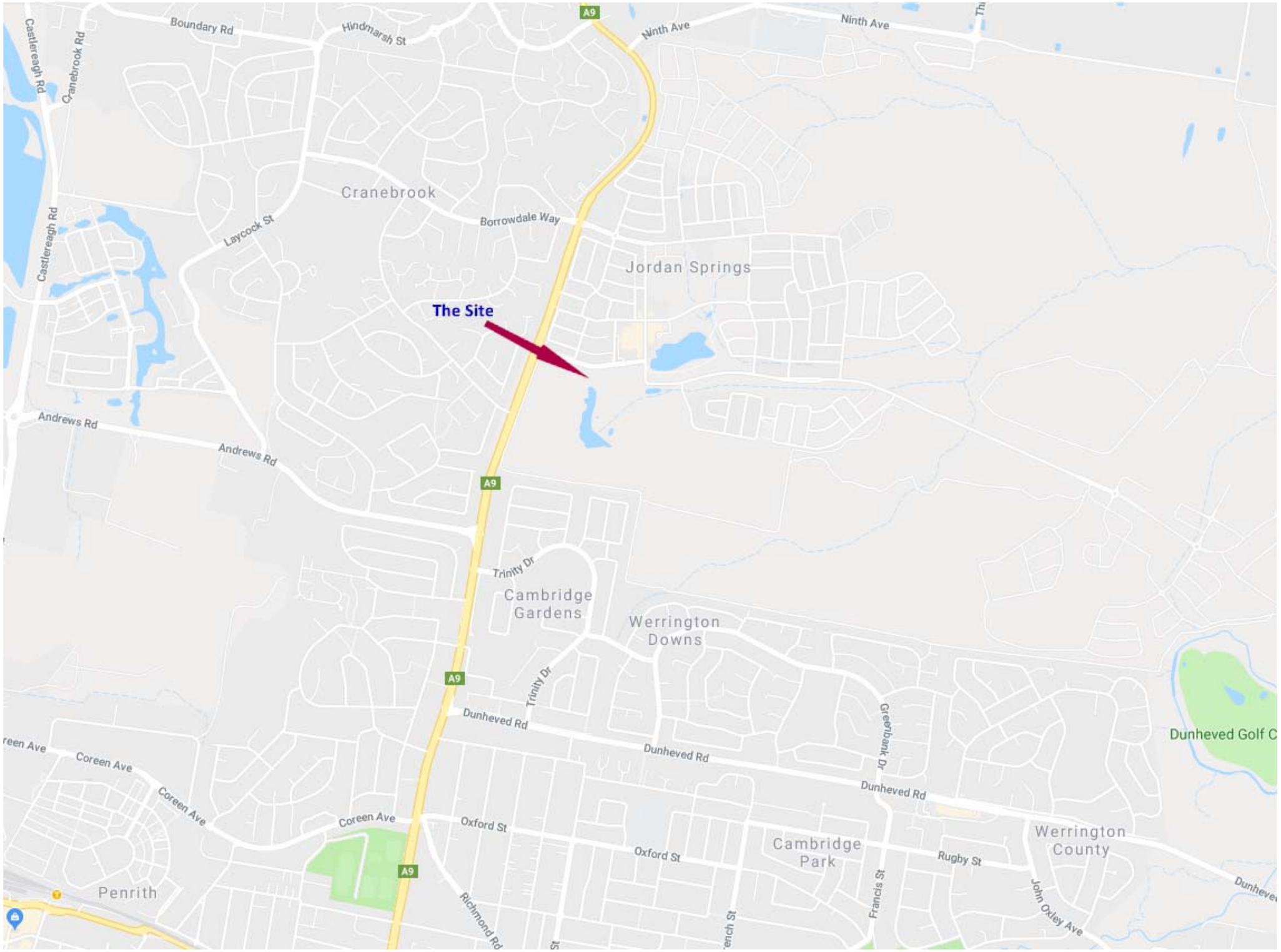
NSW DEC 2006, 'Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)'.

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

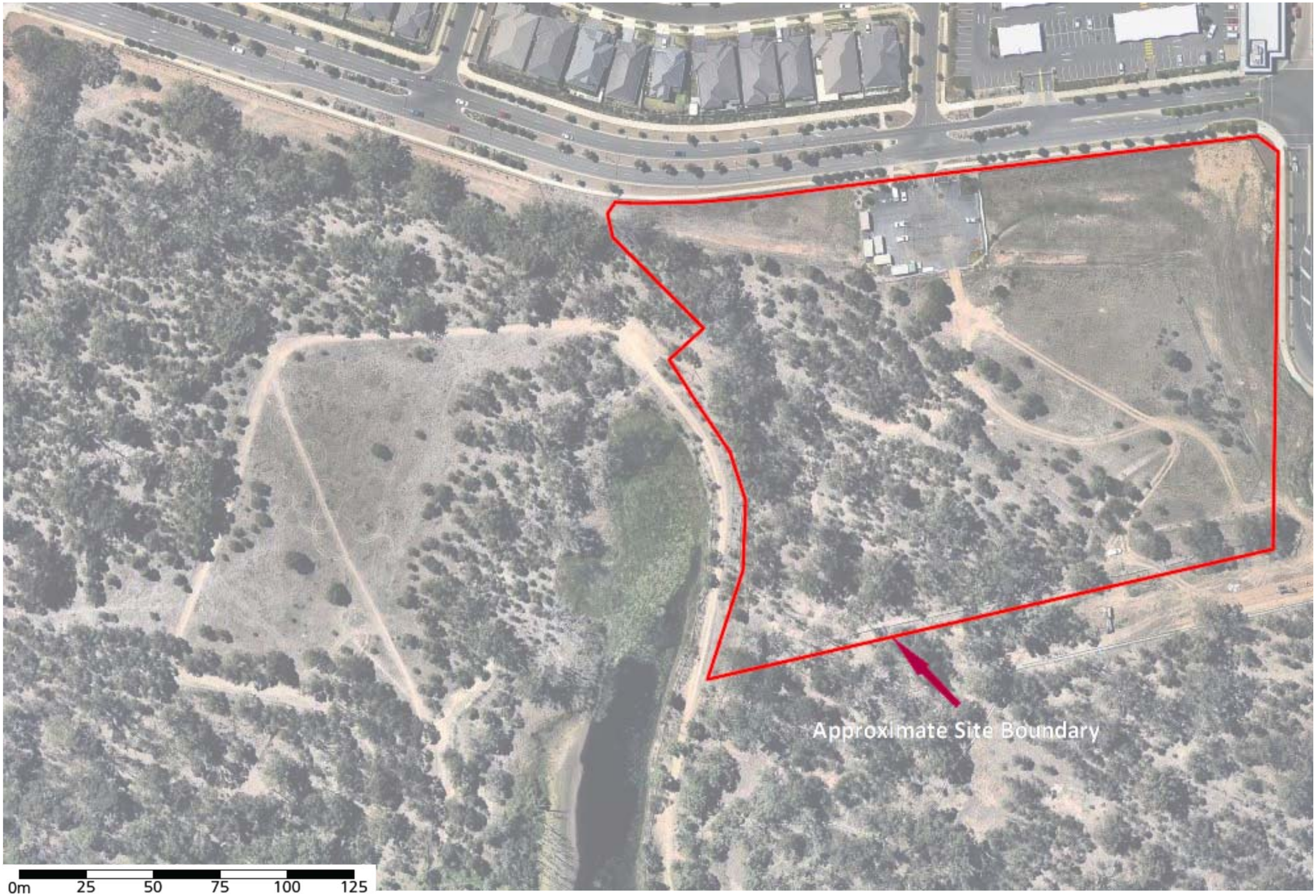
NSW Office of Water Groundwater Database (www. http://allwaterdata.water.nsw.gov.au/water)

URS 2008, 'Contamination Management Plan, Western Precinct Development Phase' dated 7 July 2008, ref: 4321 7287.

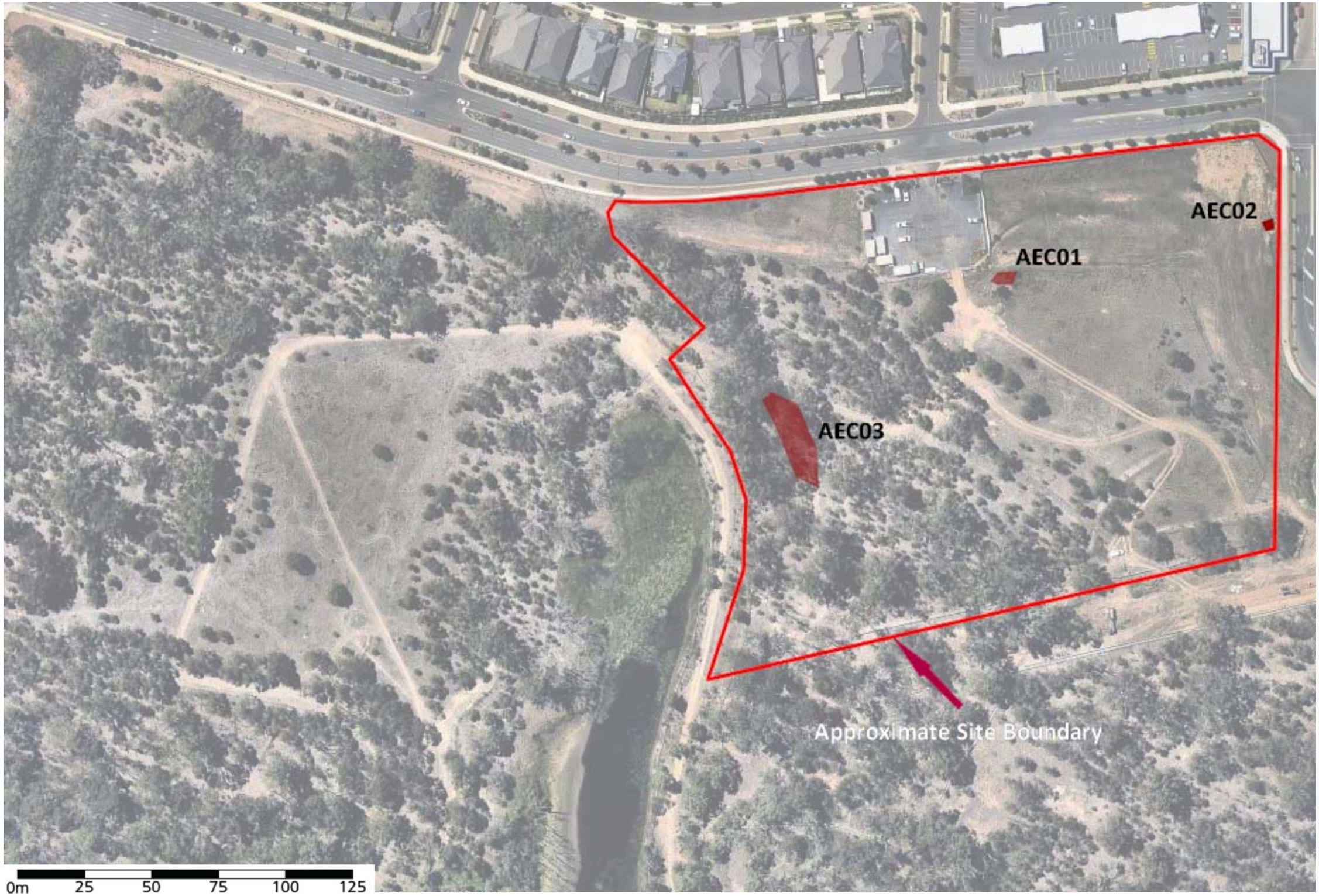
FIGURES



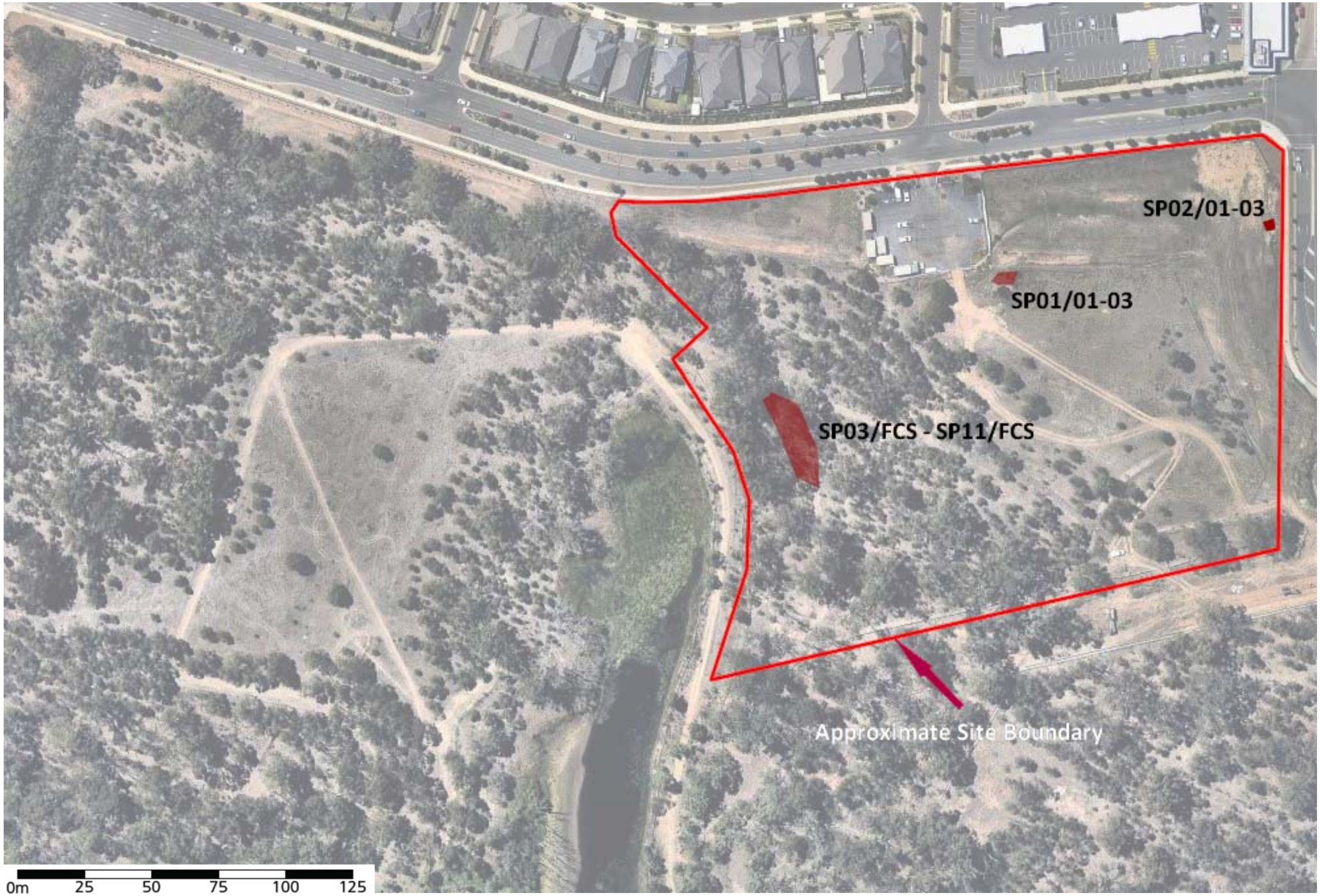
Alliance Geotechnical Pty Ltd ENGINEERING | ENVIRONMENTAL | TESTING **10 Welder Road, Seven Hills, NSW** **T: 1800 288 188 E: enviro@allgeo.com.au**	Project Address: Lot 3991 in DP1190132 Jordan Springs Boulevard, Jordan Springs, NSW	Client: LLRL Management Services as Trustee of LLRL Management Services Trust	Project Name: Supplementary Contamination Assessment	Report No: 7161-ER-1-3 Figure Date: 20 April 2018	N	Figure No: 1	Figure Title: Site Locality Plan



Alliance Geotechnical Pty Ltd ENGINEERING | ENVIRONMENTAL | TESTING **10 Welder Road, Seven Hills, NSW** **T: 1800 288 188 E: enviro@allgeo.com.au**	Project Address: Lot 3991 in DP1190132 Jordan Springs Boulevard, Jordan Springs, NSW	Client: LLRL Management Services as Trustee of LLRL Management Services Trust	Project Name: Supplementary Contamination Assessment	Report No: 7161-ER-1-3 Figure Date: 20 April 2018	N	Figure No: 2	Figure Title: Site Layout Plan



Alliance Geotechnical Pty Ltd ENGINEERING | ENVIRONMENTAL | TESTING **10 Welder Road, Seven Hills, NSW** **T: 1800 288 188 E: enviro@allgeo.com.au**	Project Address: Lot 3991 in DP1190132 Jordan Springs Boulevard, Jordan Springs, NSW	Client: LLRL Management Services as Trustee of LLRL Management Services Trust	Project Name: Supplementary Contamination Assessment	Report No: 7161-ER-1-3 Figure Date: 20/04/2018	N	Figure No: 3	Figure Title: Areas of Environmental Concern



Alliance Geotechnical Pty Ltd ENGINEERING | ENVIRONMENTAL | TESTING 10 Welder Road, Seven Hills, NSW T: 1800 288 188 E: enviro@allgeo.com.au	Project Address: Lot 3991 in DP1190132 Jordan Springs Boulevard, Jordan Springs, NSW	Client: LLRL Management Services as Trustee of LLRL Management Services Trust	Project Name: Supplementary Contamination Assessment	Report No: 7161-ER-1-3 Figure Date: 20/04/2018	N	Figure No: 4	Figure Title: Sampling Point Layout Plan

TABLES

Alliance Geotechnical Pty Ltd **Report No. 7161-ER-1-3**
Table LAR1 Laboratory Analytical Results - Soils
Supplementary Contamination Assessment
Lot 3990 and 3991 in DP1190132, Jordan Springs Boulevarde, Jordan Springs, NSW

Analyte Name	Units	Direct Contact HIL-A & HSL-A Residential (mg/kg)	Inhalation / Vapour Intrusion HSL A 0m to <1m (mg/kg)	Management Limits - Residential (mg/kg)	Reporting Limit	SE177801.001 SP01/01 9/4/2018 Soil Result	SE177801.002 SP01/02 9/4/2018 Soil Result	SE177801.003 SP01/03 9/4/2018 Soil Result	SE177801.004 SP02/01 9/4/2018 Soil Result	SE177801.005 SP02/02 9/4/2018 Soil Result	SE177801.007 SP02/03 9/4/2018 Soil Result	SE177801.017 DUP01 9/4/2018 Soil Result
BTEXN in Soil												
Benzene	mg/kg	100	0.5		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Toluene	mg/kg	14000	160		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Ethylbenzene	mg/kg	4500	55		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Total Xylenes	mg/kg	12000	40		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	N.A.
Naphthalene	mg/kg	1400	3		0.1	**0.4**	<0.1	<0.1	**0.4**	**0.3**	<0.1	N.A.
TRH in Soil												
Benzene (F0)	mg/kg	100			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
TRH C6-C10	mg/kg	4400		700	25	<25	<25	<25	<25	<25	<25	N.A.
TRH C6-C10 minus BTEX (F1)	mg/kg		45		25	<25	<25	<25	<25	<25	<25	N.A.
TRH >C10-C16	mg/kg	3300		1000	25	<25	<25	<25	<25	<25	<25	N.A.
TRH >C10-C16 - Naphthalene (F2)	mg/kg		110		25	<25	<25	<25	<25	<25	<25	N.A.
TRH >C16-C34 (F3)	mg/kg	4500		3500	90	<90	<90	<90	<90	<90	<90	N.A.
TRH >C34-C40 (F4)	mg/kg	6300		10000	120	<120	<120	<120	<120	<120	<120	N.A.
PAH in Soil												
Naphthalene	mg/kg	1400	3		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
2-methylnaphthalene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
1-methylnaphthalene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Acenaphthylene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Acenaphthene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Fluorene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Phenanthrene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	N.A.
Anthracene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Fluoranthene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	N.A.
Pyrene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.5**	<0.1	N.A.
Benzo(a)anthracene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	N.A.
Chrysene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	N.A.
Benzo(b&j)fluoranthene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	N.A.
Benzo(k)fluoranthene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Benzo(a)pyrene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	N.A.
Indeno(1,2,3-cd)pyrene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Dibenzo(ah)anthracene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Benzo(ghi)perylene	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	N.A.
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	3			0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	N.A.
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)				0.2	<0.2	<0.2	<0.2	<0.2	**0.2**	<0.2	N.A.
Total PAH (18)	mg/kg				0.8	<0.8	<0.8	<0.8	<0.8	**1.9**	<0.8	N.A.
Total PAH (NEPM/WHO 16)	mg/kg	300			0.8	<0.8	<0.8	<0.8	<0.8	**1.9**	<0.8	N.A.
OCP in Soil												
Hexachlorobenzene (HCB)	mg/kg	10			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Alpha BHC	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Lindane	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Heptachlor	mg/kg	6			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Aldrin	mg/kg	6			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Dieldrin	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Beta BHC	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Delta BHC	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Heptachlor epoxide	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
o,p'-DDT	mg/kg	240			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
p,p'-DDT	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
o,p'-DDE	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
p,p'-DDE	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
o,p'-DDD	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
p,p'-DDD	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Alpha Endosulfan	mg/kg	270			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Beta Endosulfan	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Gamma Chlordane	mg/kg	50			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Alpha Chlordane	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
trans-Nonachlor	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Endrin	mg/kg	10			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Endosulfan sulphate	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Endrin Aldehyde	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Methoxychlor	mg/kg	300			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Endrin Ketone	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Isodrin	mg/kg				0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
Mirex	mg/kg	10			0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N.A.
PCB in Soil												
Arochlor 1016	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1221	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1232	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1242	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1248	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1254	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1260	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1262	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Arochlor 1268	mg/kg				0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N.A.
Total PCBs (Arochlors)	mg/kg	1			1	<1	<1	<1	<1	<1	<1	N.A.
Metals in Soil												
Arsenic, As	mg/kg	100			3	**6**	**7**	**5**	**7**	**7**	**5**	**4**
Cadmium, Cd	mg/kg	20			0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	100			0.3	**11**	**21**	**13**	**15**	**15**	**13**	**13**
Copper, Cu	mg/kg	6000			0.5	**14**	**20**	**24**	**43**	**55**	**34**	**22**
Lead, Pb	mg/kg	300			1	**14**	**19**	**14**	**45**	**68**	**40**	**15**
Nickel, Ni	mg/kg	400			0.5	**2.4**	**6.9**	**7.6**	**13**	**12**	**11**	**4.2**
Zinc, Zn	mg/kg	7400			0.5	**14**	**42**	**31**	**140**	**180**	**190**	**28**
Mercury	mg/kg	40			0.05	<0.05	<0.05	<0.05	<0.05	**0.05**	<0.05	<0.05

Alliance Geotechnical Pty Ltd **Report No. 7161-ER-1-3**

Table LAR2 - Laboratory Analytical Results - Soils (Asbestos)

Supplementary Contamination Assessment

Lot 3990 and 3991 in DP1190132, Jordan Springs Boulevarde, Jordan Springs, NSW

Analyte Name	Units	Health Screening Levels Residential A	Reporting Limit	Sample Name	SE177801A.001	SE177801A.002	SE177801A.003	SE177801A.004	SE177801A.005	SE177801A.006	SE177801A.007	SE177801A.008	SE177801A.009	SE177801A.010	SE177801A.011	SE177801A.012	SE177801A.013	SE177801A.014	SE177801A.015	SE177801A.016
				Description	SP01/01	SP01/02	SP01/03	SP02/01	SP02/02	SP02/02-FRAG	SP02/03	SP03/FCS	SP04/FCS	SP05/FCS	SP06/FCS	SP07/FCS	SP08/FCS	SP09/FCS	SP10/FCS	SP11/FCS
				Sample Date	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018	9/4/2018
				Matrix	Soil	Soil	Soil	Soil	Soil	Material	Soil	Material	Material	Material	Material	Material	Material	Material	Material	Material
			Reporting Limit		Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Total Sample Weight	g		1		**576**	**532**	**501**	**537**	**503**	N.A.	**426**	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ACM in >7mm Sample	g		0.01		<0.01	<0.01	<0.01	<0.01	<0.01	N.A.	<0.01	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
AF/FA in >2mm to <7mm Sample	g		0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	N.A.	<0.0001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
AF/FA in <2mm Sample	g		0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	N.A.	<0.0001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Asbestos in soil (>7mm ACM)	%w/w	0.01	0.01		<0.01	<0.01	<0.01	<0.01	<0.01	N.A.	<0.01	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Asbestos in soil (<2mm AF/FA)	%w/w	0.001	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Asbestos in soil (<7mm AF/FA)	%w/w	0.001	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Fibre Type	No unit		-		ORG,NAD	ORG,NAD	NAD	ORG,NAD	ORG,NAD	Chrysotile	ORG,NAD	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile & Crocidolite	Chrysotile	Chrysotile & Crocidolite
Asbestos Detected	No unit	Yes	-		N.A.	N.A.	N.A.	N.A.	N.A.	**Yes**	N.A.	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Alliance Geotechnical Pty Ltd **Report No. 7161-ER-1-3**

Table LAR3 - Laboratory Analytical Results - RPD

Supplementary Contamination Assessment

Lot 3990 and 3991 in DP1190132, Jordan Springs Boulevarde, Jordan Springs, NSW

		Sample Name	SE177801.001	SE177801.017	RPD %	S18-Ap12479	RPD %
		Description	SP01/01	DUP01		DUP1A	
		Sample Date	9/4/2018	9/4/2018		9/4/2018	
		Matrix	Soil	Soil		Soil	
Analyte Name	**Units**	**Reporting Limit**	**Result**	**Result**		**Result**	
Metals in Soil							
Arsenic, As	mg/kg	3	6	4	40	7.2	18
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	#VALUE!	<0.4	#VALUE!
Chromium, Cr	mg/kg	0.3	11	13	17	14	24
Copper, Cu	mg/kg	0.5	14	22	**44**	22	**44**
Lead, Pb	mg/kg	1	14	15	7	18	25
Nickel, Ni	mg/kg	0.5	2.4	4.2	55	6.8	**96**
Zinc, Zn	mg/kg	0.5	14	28	**67**	27	**63**
Mercury	mg/kg	0.05	<0.05	<0.05	#VALUE!	<0.1	#VALUE!

APPENDIX A

SURVEY

MGA

SEE SHEET 2

SEE SHEET 3

SEE SHEET 4

SEE SHEET 5

SEE SHEET 6

SEE SHEET 7

SEE SHEET 8

SEE SHEET 9

SEE SHEET 10

ROWLAND PLACE

SANDSTOCK CRESCENT

PARADE

MATCHAM STREET

MCGARRITY'S

JORDAN SPRINGS BOULEVARD

TYLER STREET

LAKESIDE PARADE

JUBILEE DRIVE

(S)

(R)

3391
DP 1190132
3.633 ha (Title)

3989
DP 1190132
5026 m² (Title)

3992
DP 1190132
1.084 ha (Title)

3990
DP 1190132
2.345 ha (Title)

3993
DP 1190132
1.183 ha (Title)

SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

10 20 30 40 50 100
1:1000

GENERAL NOTES:-

1. THIS SURVEY IS NOT A 'LAND SURVEY' AS DEFINED BY THE SURVEYING AND SPATIAL INFORMATION ACT, 2002.
2. THE BOUNDARIES OF THE LAND HAVE NOT BEEN SURVEYED. THE RELATIONSHIP BETWEEN THE BOUNDARIES SHOWN AND FEATURES SURVEYED ARE APPROXIMATE AND SUITABLE FOR PLOTTING PURPOSES ONLY.
3. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488-2013.
4. UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE'YOU-DIG' PLANS AND ARE QUALITY LEVEL D AS DEFINED BY AS 5488-2013. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.
5. ONLY TREES GREATER THAN 3.5 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS AREA DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN. NO TREES HAVE BEEN LOCATED ON LOTS 3990 & 3991 IN DP1190132.
6. CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
7. CONTOUR INTERVAL 0.5 m.
8. ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK.
9. THE ORIENTATION OF THIS PLAN IS MGA NORTH AS DETERMINED FROM DP 1190132. THE VARIATION FROM MGA NORTH TO TRUE NORTH IS APPROXIMATELY 1°06'.
10. SCHEDULE OF EASEMENTS NOTED ON TITLES DATED 11/01/2017:

LOT 3989 IN DP 1190132
APPURTENANT (NOT SHOWN ON PLAN):
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274)
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528)
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620)
* EASEMENT FOR TRANSMISSION LINE 4.85 WIDE (N324748)
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196)

LOT 3990 IN DP 1190132
APPURTENANT (NOT SHOWN ON PLAN):
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274)
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528)
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620)
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748)
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196)

BURDENED:
* EASEMENT FOR SERVICES VARIABLE WIDTH (DP 1190132) SHOWN 'S'
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3991 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP1190132) SHOWN 'R'
* EASEMENT FOR SERVICES VARIABLE WIDTH (DP 1190132) SHOWN 'S'
* COVENANT (DP 1190132)

BURDENED:
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3992 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP1190132) SHOWN 'R'

BURDENED:
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3993 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP 1190132) SHOWN 'R'

11. COVENANTS AND RESTRICTIONS ARE NOTED ON ALL TITLES. THESE HAVE NOT BEEN INVESTIGATED.
12. MGA COORDINATES ARE BASED ON SSM 175299 (CLASS C ORDER 3)

DIAL BEFORE YOU DIG www.1100.com.au

ISSUE	DATE	AMENDMENT
A	20/12/16	ORIGINAL ISSUE
B	15/02/17	ADDITIONAL INFORMATION LOT 3993 DP1190132
C	15/01/18	ADDITIONAL INFORMATION LOTS 3390 & 3391 DP1190132

CLIENT: LENDLEASE

SCALE 1:1000
ORIGIN OF LEVELS: SSM 80426 RL 47.288
DATUM: A.H.D.
REF.: 7202
DATE: 15/01/2018
SURV/CHK: SW/CT
SHEET 1 OF 10 SHEETS
PLAN A1
ISSUE C

DETAIL AND LEVEL SURVEY OF PART OF JORDAN SPRINGS BOULEVARD, LAKESIDE PARADE & JUBILEE DRIVE JORDAN SPRINGS

SDG LAND DEVELOPMENT SOLUTIONS
A.B.N. 80 213 023 631
Suite 1 3 Railway Street
BAULKHAM HILLS 2153
P.O.Box 2572
NORTH PARRAMATTA 1750
t: (02) 9630 7955
e: office@sdg.net.au
w: www.sdg.net.au

APPENDIX B

PREVIOUS REPORTS

Contamination Management Plan
Western Precinct
Development Phase

Prepared for

Maryland Development Company

Private Road
Off Forrester Road
St Marys 2760

JULY 2008

URS

Project Director:

Seth Molinari
Senior Principal

URS Australia Pty Ltd
Level 3, 116 Miller Street
North Sydney, NSW 2060 Australia
Tel: 61 2 8925 5500
Fax: 61 2 8925 5555

Author:

David Smith
Principal

Date: **7th July 2008**
Reference: 4321 7287
Status: Final

Contents

Glossary of Abbreviations and Terms

Abbreviation	Term	Definition
Ammunition	Ammunition	A device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in connection with defence or offence including demolitions. Certain ammunition can be used for training, ceremonial or other non-operational purposes.
Category A	Category A ordnance items	An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and containing explosive filling, but excluding small arms ammunition.
Category B	Category B ordnance items -	An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and not containing explosive filling, but excluding small arms ammunition.
CMP (2003)	Contamination Management Plan for the Eastern Precinct	The Contamination Management Plan prepared in 2003 and submitted to Blacktown City Council and other authorities as required by the Site Audit Statements issued in the Stage 2 Decontamination Audit of ADI St Marys Munitions Factory, dated 7th June 1999.
CMP	Contamination Management Plan	The Contamination Management Plan issued to support Precinct Plan(s).
DPP	Dunheved Precinct Plan	The Dunheved Precinct Plans set out the future pattern of development for the Dunheved Precinct. The Plan was adopted by Penrith City Council on 11 December 2006 and by Blacktown City Council on 12 January 2007.
DUXOP	Defence Unexploded Ordnance Panel	The panel of contractors and consultants from whom the Department of Defence selects members for UXO related tasks.

Abbreviation	Term	Definition
EPP	Eastern Precinct Plan	The Eastern Precinct Plan sets out the future pattern of development for the Eastern Precinct. The Plan was adopted by Blacktown City Council on 4 February 2004.
Induction	Site Specific Induction	Section 8(2) of the OHS Act requires employers to ensure that persons other than their workers are not exposed to risks while in the employer's workplace. These persons include contractors, customers and visitors. If there are significant risks in the workplace, there may be a need for site induction training and procedures for managing people while on the premises.[1]
Property	Property	The whole of the landholding by St Marys Land Limited and which is sometimes called the St Marys Property for the purposes of its rezoning and redevelopment.
Site	Site	The subject area, where potential contamination has been found.
UXO	Unexploded Ordnance	Explosive ordnance that has been primed, fused, armed or otherwise prepared for action and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations, personnel or material but remains unexploded either by malfunction or design or for any cause. UXO includes items of military ammunition or explosives removed from their original resting-place for any reason, including souveniring.

[1] "**http://www.workcover.nsw.gov.au/Employers/LegalResponsibility/default.htm**" WorkCover's webpage on 18th September 2006

1.1 General Introduction

The former Australian Defence Industries (ADI) Property (the Property) at St Marys was endorsed by the NSW Government for inclusion on the Urban Development Program in 1993. The Property was seen to present an opportunity to provide housing for Sydney's growing population within an environmentally sustainable framework.

The Property is located approximately 45km west of the Sydney CBD, 5km north-east of the Penrith City Centre and 12km west of the Blacktown City Centre. The main western railway is located approximately 2.5km south of the Property. The Great Western Highway is located another 1 km south and the M4 Motorway a further 1.5km south.

The Property has an area of 1,545ha, and stretches roughly 7 kilometres from east to west and nearly 3 kilometres from north to south, from Forrester Road, St Marys in the east to The Northern Road, Cranebrook in the west, and is bounded by Llandilo and Willmot in the north and Cambridge Gardens / Werrington County and the Dunheved Industrial Area in the south. Figure 1, following, illustrates the location of the Property.

Figure 1 Aerial photograph of the St Marys Property

Given that the Property straddles the boundary between two local government areas (Blacktown and Penrith), the NSW Government decided that a regional environmental plan should be prepared covering development of the Property. Technical investigations into the environmental values and development capability of the land were commenced in 1994, and the Regional Environmental Plan for St Marys (Sydney Regional Environmental Plan No. 30 (SREP 30)) was gazetted in January, 2001. SREP 30 zoned the land for a combination of "urban", "employment", "regional open space", and "regional park" uses.

A package of documents was prepared to guide and control development comprising SREP 30 (maps and a written instrument) and an Environmental Planning Strategy (EPS) which sets out performance objectives and strategies to address key constraints associated with the Property, including: conservation, cultural heritage, water and soils, transport, urban form, energy and waste, human services, employment and land contamination.

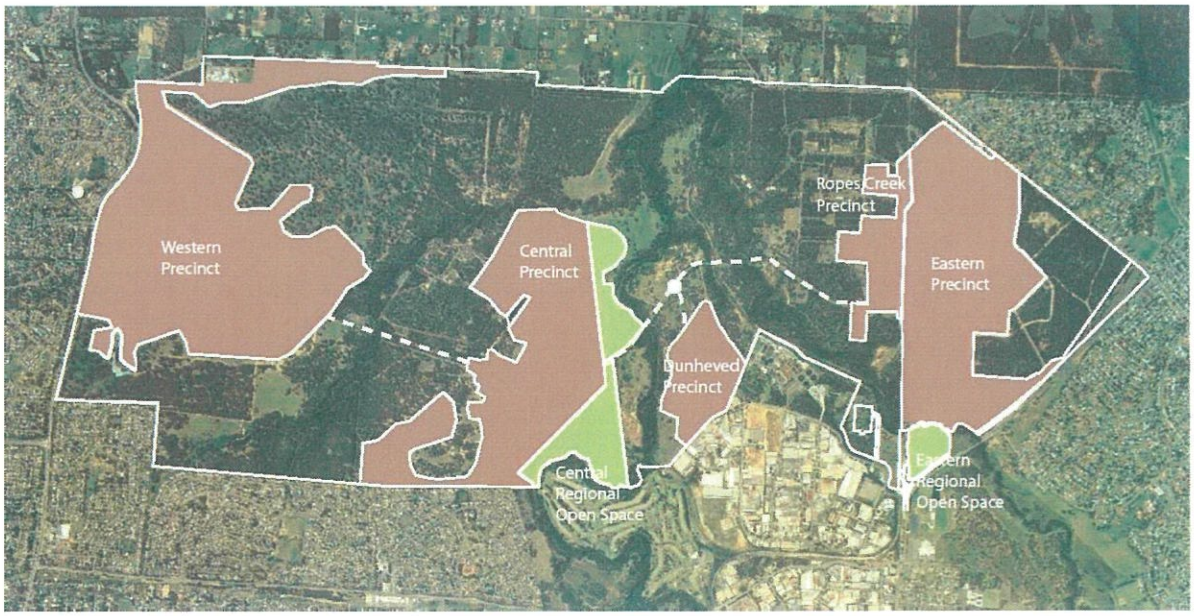
In December 2002, a Deed of Agreement was entered into between the landowner and developers of the land (a Joint Venture comprising ComLand and Lend Lease Development) and the NSW Government setting out the developer's and State Government's responsibilities in providing services and infrastructure.

SREP 30 identified six development "precincts" (known as the Western Precinct, Central Precinct, North and South Dunheved Precincts, Ropes Creek Precinct and Eastern Precinct) within the Property.

SREP 30 requires that a Precinct Plan, addressing the issues in SREP 30 and the EPS (including preparation of management plans for a range of key issues), be adopted by Council prior to any development taking place.

In March 2002, the Commonwealth Government advised that those areas of the Property listed on the Register of the National Estate should be excluded from urban development. This had the effect of changing the boundaries of the areas to be set aside for conservation. SREP 30 was subsequently amended in April 2006 to reflect these boundary changes. The precincts available for development are shown in Figure 2 below.

Figure 2 Western Precinct (with other developable areas)



On 29 September 2006, the Minister for Planning declared the Western Precinct a Release Area, paving the way for the preparation of a Precinct Plan for this area. The Western Precinct, the subject of this CMP, occupies an area of approximately 229 hectares. Although currently zoned under SREP 30 for both Urban and Employment uses, there is a draft amendment to SREP 30 currently being prepared under which the entire Western Precinct is zoned Urban.

A Precinct Plan for the Eastern Precinct (FPP) was adopted by Blacktown City Council (BCC) on 4 February 2004. The EPP incorporated a Contamination Management Plan (CMP) prepared by URS in 2003, and other management plans, and an accompanying Development Control Strategy (DCS). The Dunheved Precinct Plans have since been adopted by Penrith City Council and Blacktown City Council.

Since completion of the CMP (2003), development of the Eastern Precinct Release Area has progressed and additional site investigations have been completed as required by Site Audit Statements.

In addition, the Department of Environment and Conservation (DEC) (incorporating the NSW Environment Protection Authority and now known as the NSW Department of Environment and Climate Change (DECC)) has provided advice to Site Auditors that "*auditors should be able to rely on expert opinion* [Department of Defence Unexploded Ordnance panel (DUXOP) consultants] *to form a view about site suitability*" when assessing a site for munitions contamination. Further deliberations by the DEC and Site Auditors have determined that the presence of munitions items on a site is not likely to be within the ambit purview of a Site Auditor accredited under the Contaminated Land Management Act (1997) – but rather a suitably qualified expert in procedures for the location, handling and disposal of munitions items. Such experts can be found in, but are not limited to, the DUXOP.

Notwithstanding this change in process, the 1999 Site Audit Statements for the St Marys property have addressed the issue of potential UXO contamination.

Bulk earthworks commenced in the Eastern Precinct on 8 December 2004. Development applications for the construction of the Ropes Creek Bridge and the Southern Entry Road into the site have been submitted to BCC and Penrith City Council.

Subsequently, CMPs have been prepared by URS for the North and South Dunheved Precincts (2004), Ropes Creek and Eastern Precincts (2006) and the Eastern Regional Park (2006).

This CMP (Western Precinct Contamination Management Plan) has been prepared to support the lodgement of the Western Precinct Plan and takes into account current site knowledge including and DECC guidance relating to the reliance on specialist consultants for use in the development phase prior to sub-division.

1.2 Introduction to the Contamination Management Plan

The Western Precinct was the subject of extensive investigation during the 1990s. The investigation work was undertaken with the full involvement of the EPA and subsequently an independent NSW EPA accredited Site Auditor who produced and issued Site Audit Statements for the whole of the St Marys Property (*Stage 2 Decontamination Audit of ADI St Marys Munitions Factory*, dated 7 June 1999).

The investigation and remediation programme for the Property commenced in 1990, with the objective of assessing the nature, degree of chemical contamination and remediating to a level suitable for redevelopment for a variety of land uses including residential. For the purposes of the remediation and validation, the Property was divided into nine sectors. The Western Precinct covers part of the following sectors as follows:

- Part Western Sector — Covered by SAS CHK001/1.
- Part Southern West Sector — Covered by SASs CHK001/1, CHK001/6 and CHK001/7.

The information presented in the remediation and validation reports for these sectors has been considered, along with other relevant information for the Property, to develop this CMP (Western Precinct).

The majority of the Western Precinct was assessed by the Site Auditor to pose a negligible risk to the public or the environment with regard to chemical contamination and/or explosive ordnance (See SASs as listed above in Appendix A). Conditions on the SASs required investigation and assessment of areas underlying roadways which had not been investigated at the date of the SASs.

1.3 Contamination Management Plan Objectives

The objective of this CMP is to provide a framework for identifying and addressing any discovery of chemical contamination or potentially explosive ordnance so as to ensure a safe working environment for workers during development and to avoid unacceptable impact on the natural environment.

Unexpected finds may occur in areas which, although searched extensively, contain remnant materials which were obscured by the local topography, the type of surface cover (e.g. building) or at a depth preventing detection. The Site Auditor considered that, while explosive ordnance may be uncovered during earthworks, it is unlikely that these will present an unacceptable risk provided appropriate procedures for the safe handling and disposal of such material are adopted.

The successful implementation of the CMP requires the appropriate briefing and Site Specific OHS Induction of Site Operatives who may uncover potential chemical contamination (including potential asbestos containing materials) and/or explosive ordnance. It is proposed this briefing will include the review of this CMP and the associated flow chart (Figure 3 on p2-4).

This CMP describes reporting procedures and lines of responsibility (See Section 3). These experts should include those with detailed knowledge of the remediation which has been undertaken at the Property and details on the location of, and access to, the supporting documents related to the assessment and remediation of the Western Precinct.

The Property has been remediated, audited and declared suitable for its intended land uses, and remnant contamination, if present, is most likely to be discovered during the development earthworks which will occur prior to subdivision.

The approaches included in this CMP are intended for use only during the site preparation phase of development, during which structures may be demolished and disposed of, land levels may be altered and redundant infrastructure is removed and new infrastructure is installed.

Subsequent plans, if required, will be administered through the relevant local government authority.

The operation of the CMP is described in the attached flow-chart (Figure 3).

The objective of the CMP is to provide clear guidance on the safe and appropriate actions in the event of encountering potential chemical or explosive ordnance contamination during site development works. Where such material is uncovered the CMP prescribes the quarantining of the relevant area of concern, allowing other site works to proceed unhindered, while the area of concern is assessed and, if necessary, remediated and validated.

Where required, reference should be made to the extensive library of documents containing information on the historic assessment and remediation of the site. This library provides a valuable source of information which can be drawn on to provide support for development of remedial and/or assessment approaches.

Two classes of potential contamination are discussed separately below: chemical (including potential asbestos containing materials) and ordnance.

2.1 Potential Chemical Contamination

Potential chemical contamination may be indicated in the field by:

- Discoloured soils;
- Odorous soils;
- Potentially asbestos containing sheeting, fragments or insulation materials; or
- The presence of other foreign materials, such as drums, waste dumps or building rubble which could be a source of contamination.

If the Site Manager considers material to be potential chemical contamination the area will be quarantined and a suitably qualified Environmental Consultant will be contacted. The Environmental Consultant will be responsible for assessing the findings, taking samples to characterise and delineate the extent of the potential contamination and defining appropriate remedial actions, if required.

Suspected asbestos containing materials should be managed in accordance with relevant WorkCover requirements and a site specific Asbestos Management Plan.

If deemed necessary by the Environmental Consultant, the contamination will be removed for disposal at a suitably licensed facility in accordance with *Waste Classification Guidelines* (NSW DECC, April 2008). The resultant excavation will be validated by the Environmental Consultant and a report on the remediation and subsequent validation will be completed and, if appropriate, be reviewed and approved by an independent NSW EPA accredited Site Auditor. The quarantine barriers can be removed and the earthworks continued upon receipt of advice from the Environmental Consultant, issue of an SAS, or preliminary advice from the Site Auditor.

If the area is determined by the Environmental Consultant to not be contaminated or the analyses meet the relevant site validation criteria, the Environmental Consultant should notify the Site Manager that the quarantine restrictions on the area can be lifted and the works in that area may resume. The Environmental Consultant will prepare a report on the investigation and the conclusions drawn.

Extensive Contamination

In the event that assessment by the Environmental Consultant identifies that the contamination is extensive[2] in its lateral and/or vertical extent, then the Environmental Consultant will prepare a sampling and analysis plan to delineate the contamination and assess the extent of any remediation required. The sampling and analysis plan must be reviewed by the independent Site Auditor, who would be engaged to review the works and issue a new SAS, on successful completion of the works.

2.2 Potential Explosive Ordnance Materials

Potential explosive ordnance material may be indicated in the field by:

- Munitions shells;
- Flares;
- Ammunition packaging;
- Grenade components; or
- Metal debris not identifiable as non-munitions or of uncertain origin.

Should potential ordnance material be uncovered, the earthworks will cease immediately and the Site Manager informed. The area should be quarantined, by means of some appropriate barrier to prevent access to the area to protect the workforce from potential injury.

The Site Manager will make a preliminary assessment of the find and determine whether it is some miscellaneous debris, a fragment of ordnance or a potentially explosive device.

Where the Site Manager can identify the item as non-ordnance debris or a minor harmless fragment of ordnance debris, the material should be removed from the excavation and disposed of appropriately.

Where it is considered to be a potentially explosive device, the Site Manager shall contact an appropriately qualified Ordnance Contractor, to assess the item and the area.

Should the Ordnance Contractor consider the object(s) to be non-ordnance or harmless fragments of ordnance, the object(s) can be removed and disposed of appropriately. The quarantine restrictions can be lifted and the earthworks continued.

[2] When the area is sufficiently large to warrant audit of the remediation and issue of a replacement Site Audit Statement, the Environmental Consultant will advise when to engage an Auditor reflecting contemporary industry practise Less than 1000 m^2 would not immediately qualify.

If the Ordnance Contractor identifies the object(s) as potential explosive ordnance, the Ordnance Contractor shall inform the Site Manager, and arrange disposal.

Based on the nature of find, it may be recommended that a geophysical survey of the area be undertaken to establish whether the item was an individual piece, one of a number of pieces or a disposal pit. The survey would be undertaken by the Ordnance Contractor using appropriate equipment. Further surveys are mandatory if the explosive ordnance is considered a Category A item or more than three readily identifiable Category B items are found at one location.

- **Category A** - An item clearly of a military nature and which might readily be recognized by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and containing explosive filling, but excluding small arms ammunition.

- **Category B** - An item clearly of a military nature and which might readily be recognized by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and not containing explosive filling, but excluding small arms ammunition.

This is in accordance with the validation procedures for the earlier site assessments, remediation and audit, and maintains the same level of confidence for the whole Property.

The Ordnance Contractor will prepare a report on the investigations undertaken, remediation works undertaken and validation surveys completed. Subject to review of the Ordnance Contractor's report by a suitably qualified consultant, the quarantine restrictions on the area can be removed and the earthworks resumed. The Site Auditor will be provided with a copy of the Clearance Report for the area issued by the Ordnance Consultant.

Further Explosive Ordnance Surveys

Any additional ordnance surveys should be designed to characterise the extent and character of the ordnance contamination and then (or concurrently) to remove the contaminant so that the area is safe for the development activities to resume. These surveys should be undertaken by an Ordnance Contractor, with the objective of characterising and delineating the extent of the explosive ordnance contamination. Such surveys may, as appropriate, utilise magnetic, electromagnetic or other diagnostic techniques.

In the event that further explosive ordnance is discovered the search area may need to be extended to ensure a suitable buffer zone is searched. A remediation and sampling strategy for the area is to be developed in consultation with the Ordnance Consultant.

All additional finds should be logged and disposed of appropriately. Once the investigation is complete a report on the scope of the investigation, remedial work and results should be produced by the Ordnance Contractor, approved by the Ordnance Consultant and provided to the independent Site Auditor. The quarantine restrictions on the area can be removed and the earthworks resumed.

2.3 Temporary Stockpiling of Materials

Earthworks in the development phase are likely to, temporarily, generate excess material which may be stockpiled for re-use. Unless some event or observation indicates that the material excavated and placed into the stockpile is potentially contaminated, no particular treatment is required other than normal dust suppression, and erosion controls in accordance with relevant Council requirements.

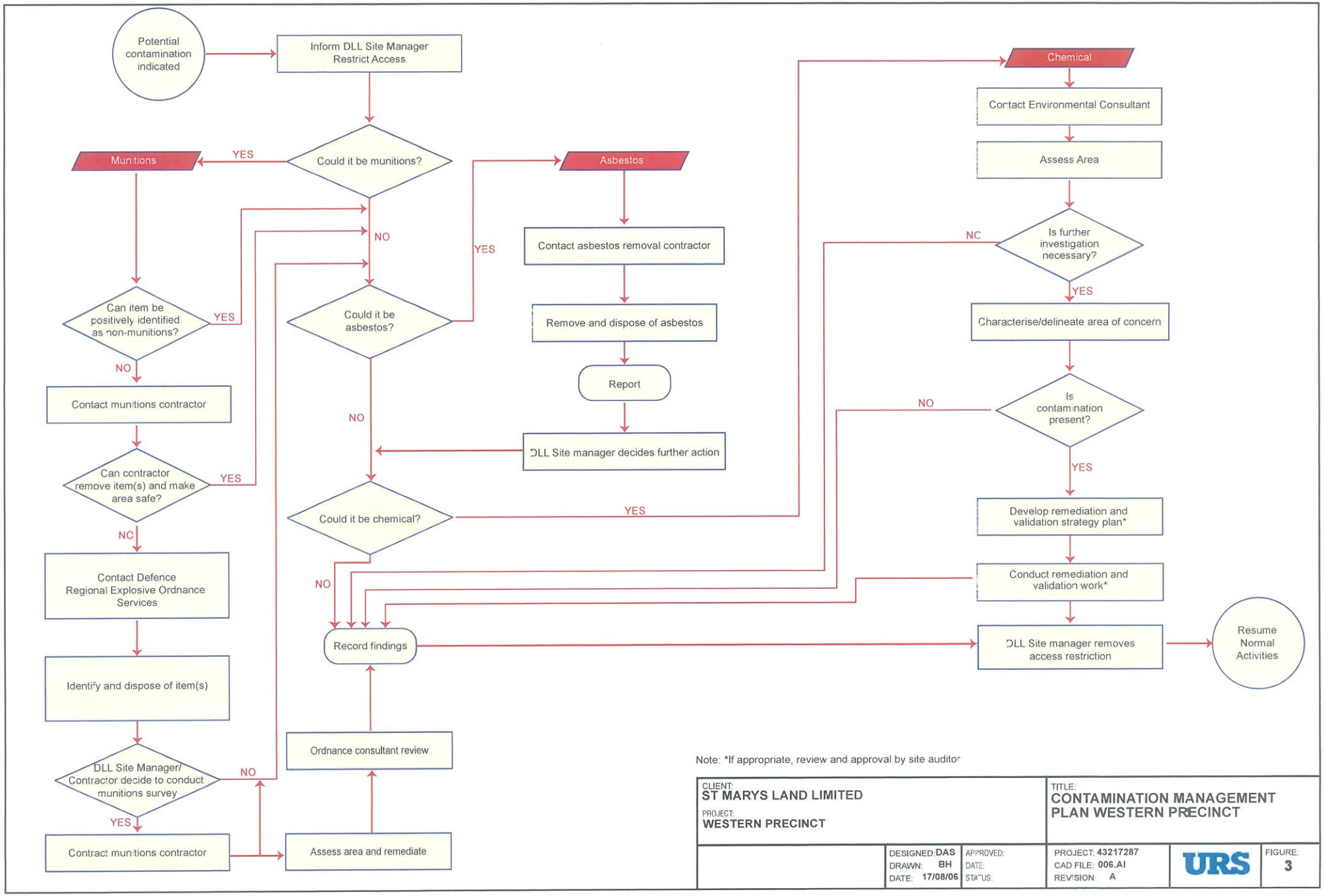
If assessment by the Environmental Consultant or the Ordnance Contractor identifies contamination that is extensive in its lateral and/or vertical extent, or a stockpile is observed to be contaminated, then the Environmental Consultant will prepare a sampling and analysis or survey plan to delineate the contamination and assess the extent of remediation required. The sampling and analysis plan or survey plan should, as appropriate, be reviewed by the Site Auditor or the Ordnance Consultant.

Subject to the agreement of the relevant Consultant, it may be possible to move and stockpile the affected material. Where temporary stockpiling is permitted such stockpiles shall be installed and maintained to eliminate risk to workers and other people due to exposure to contaminants in dust or vapours and risk to the environment as a result of silt or contamination of stormwater.

Validation sampling or surveying of the contaminated area or stockpile would be required before earthworks continue in that area.

2.4 Contaminated Management Plan Flowchart

Figure 3, following, describes the decision processes in the implementation of this CMP.



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Summary of Roles & Responsibilities

SECTION 3

The key roles[3] and responsibilities with respect to this CMP are as follows:

Title	Role
Asbestos Consultant	Responsible for reviewing the assessment of areas contaminated by potential asbestos containing materials. The Asbestos Consultant will provide a brief report which certifies the subject area is free of asbestos and suitable for residential development.
Asbestos or Environmental Contractor	Responsible for removal or treatment of contaminated material in accordance with this procedure and direction by the Environmental Consultant and the Site Manager.
Environmental Consultant	Once called to the site, the Environmental Consultant will be responsible for assessing the potential chemical contamination find, undertaking any necessary sampling and delineation, if required, developing a remedial scope and validating remediation to render the site suitable for residential development. The Environmental Consultant may, as appropriate, have expertise in environmental assessment and/or asbestos assessment. All findings and conclusions will be reported, as appropriate, to the satisfaction of the Site Manager and/or the Site Auditor or asbestos consultant if a Site Audit is not required.
Site Manager:	Responsible for the preliminary assessment of potential contamination and/or ordnance materials discovered and assessing whether further action is required. The Site Manager is responsible for ensuring the induction of Site Operatives, assessing the adequacy of quarantine measures and contacting the relevant Consultant and/or Ordnance Contractors and Site Auditor where appropriate. Once an area is declared free of the contamination, the Site Manager's role will be to remove the quarantine and allow site works to proceed.
Ordnance Consultant	Responsible for reviewing the survey and assessment of areas contaminated by suspected ordnance which is undertaken either as a consequence of discovery of suspect materials or as a requirement of the Site Audit Statements. The Ordnance Consultant, who will be independent of the Ordnance Contractor and be a member of DUXOP, will, when satisfied with information provided by the Ordnance Contractor, provide a letter which confirms the site is suitable for recommencement of development activities.

[3] Contact details are updated as required and can be seen in Appendix A

Title	Role
Ordnance Contractor	Once called to the site, the Ordnance Contractor will be responsible for assessing the ordnance find, undertaking any surveying sampling and delineation, developing any necessary remedial scope and validating any remediation necessary to render the site suitable for residential development. The Ordnance Contractor shall complete a clearance report on each area investigated and/or remediated and provide a copy for review by the Ordnance Consultant. As necessary, the Ordnance Contractor will conduct surveys of the site and complete reports to validate the remediation of areas where ordnance is discovered for review by the Ordnance Consultant.
Site Auditor	Responsible for reviewing the remediation and assessment of areas contaminated by chemicals which is undertaken either as a consequence of discovery of suspect materials or as a requirement of the Site Audit Statements. The Site Auditor, who will be independent of the Environmental Consultant and accredited by the NSW EPA, will then, when satisfied by the information provided and relying on clearance reports provided by the Ordnance Consultant, issue further Site Audit Statements which certify the site is suitable for residential development.
Site Operatives:	During the works, the Site Operative will be vigilant for potential contamination and/or ordnance. Where potential contamination and/or ordnance is identified, Site Operatives will quarantine the area and inform the Site Manager

Limitations

SECTION 4

URS Australia Pty Ltd (URS) has prepared this report for the use of Maryland Development Company in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 12 July 2007.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared in the period up to 7th 2008 and is based on the information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal vice. Legal advice can only be given by qualified legal practitioners.

Appendix A
SITE AUDIT STATEMENTS

NSW Environment Protection Authority
SITE AUDIT STATEMENT (SAS)

Site Audit Statement No.: CHK001/1

Site Auditor (accredited under NSW Contaminated Land Management Act 1997):

Name: Christopher H Kidd Company: HLA-Envirosciences Pty Limited
Address: 55-65 Grandview Street, Pymble, NSW Postcode: 2076
Phone: (02) 9988 4422 Fax: (02) 9988 4441

Site Details

ADI St. Marys Property – excluding Eastern Sector, QEL, Site 6 and Site 23, buildings and concrete stockpile.

Address: Forrester Road, St. Marys	Postcode: 2760
Lot and DP Number:	Lot 2 in DP803832 Lot 2 and 3 in DP223888 (part of) Lot 3 in DP789196 Lot 3 in DP598653 (see attached map for excluded areas)
Local Government Area:	Penrith and Blacktown

Site Audit requested by:

Name: Mr P Newton	Company: Department of Urban Affairs and Planning
Address:	Sydney Region West Level 8, Signature Tower 2-10 Wentworth Street Parramatta NSW 2150 Phone: (02) 9895 7142 - Fax: (02) 9895 6270

Name of contact person (if different from above:

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

• ADI Limited	Chemical and Explosives Ordnance Investigations, Remediation and Validation 1990 - 1999
• Mackie Martin & Associates	Groundwater Investigations, 1991

Title(s) of Report(s) reviewed:

1. Historical Report – St Marys Property, ADI Limited, 1996,
2. Validation Report for the Western Sector, ADI St Marys Facility, ADI Limited November 1994;
3. Validation Report for the North Western Sector of the ADI St Marys Facility, Report No. 498800, ADI Limited 1995;
4. Validation Report for the Southern Sector West of the ADI St Marys Property, Report No. 498810, ADI Limited 1996;

5. Validation Report for the Southern Sector East of the St Marys Property, Report No. 498810, ADI Limited 1996;
6. Validation Report for the Northern Sector of the ADI St Marys Property, Report No. 498820, ADI Limited 1996;
7. Validation Report for the Cental Sector East of the ADI St Marys Property, Report No. 498840, ADI Limited 1997;
8. Validation Report for the Central Sector West of the ADI St Marys Property, Report No 498840, ADI Limited 1996,
9. Validation Report for the North Eastern Sector of the ADI St Marys Property, Report No. 498850, ADI Limited 1996;
10. QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.

Other Information reviewed:

1. Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.
2. Remediation Action Plan for the Northern Sector, ADI St Marys Facility, Report No. 498820, ADI Limited 1996;
3. Remediation Action Plan for Central Eastern Sector, ADI St Marys Facility, Report No. 498840, ADI Limited 1996;
4. Remediation Action Plan for the Eastern Sector of the ADI St Marys Property, Report No. 498830, ADI Limited 1996;
5. Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

Summary Site Audit Report Title:

Stage 2 Decontamination Audit Report for ADI Site, St Marys

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick **all** appropriate boxes)

(a) **is suitable for the following use(s):**

- ✓ residential, including substantial vegetable garden and poultry;
- ~~☐ residential, including substantial vegetable garden, excluding poultry;~~
- ~~☐ residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry;~~
- ✓ residential with minimal opportunity for soil access including units;
- ✓ daycare centre, preschool, primary school;
- ✓ secondary school;
- ✓ park, recreational open space, playing field;
- ✓ commercial/industrial use;
- ~~☐ Other~~

subject to

✓ Conditions

1. Excludes Eastern Sector, QEL, Site 6 and Site 23 which are covered by separate site audit statements, namely CHK001/2, CHK001/3, CHK001/4 and CHK001/5.
2. Excludes areas not yet investigated including the footprint of original buildings, car parks and roads, mainly around former Administration Centre Buildings CHK001/6) and the concrete stockpile in Central Sector West. (Stockpile CHK001/7)
3. An appropriate management plan, including procedures for the safe handling and disposal of any items of ordnance that may be found during earthworks, should be lodged prior to the commencement of development earthworks. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).

~~(b) is not suitable for any beneficial use due to risk of harm from contamination~~

~~☐ (comments):~~

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a site auditor (Accreditation No. 9813).

I Certify that:

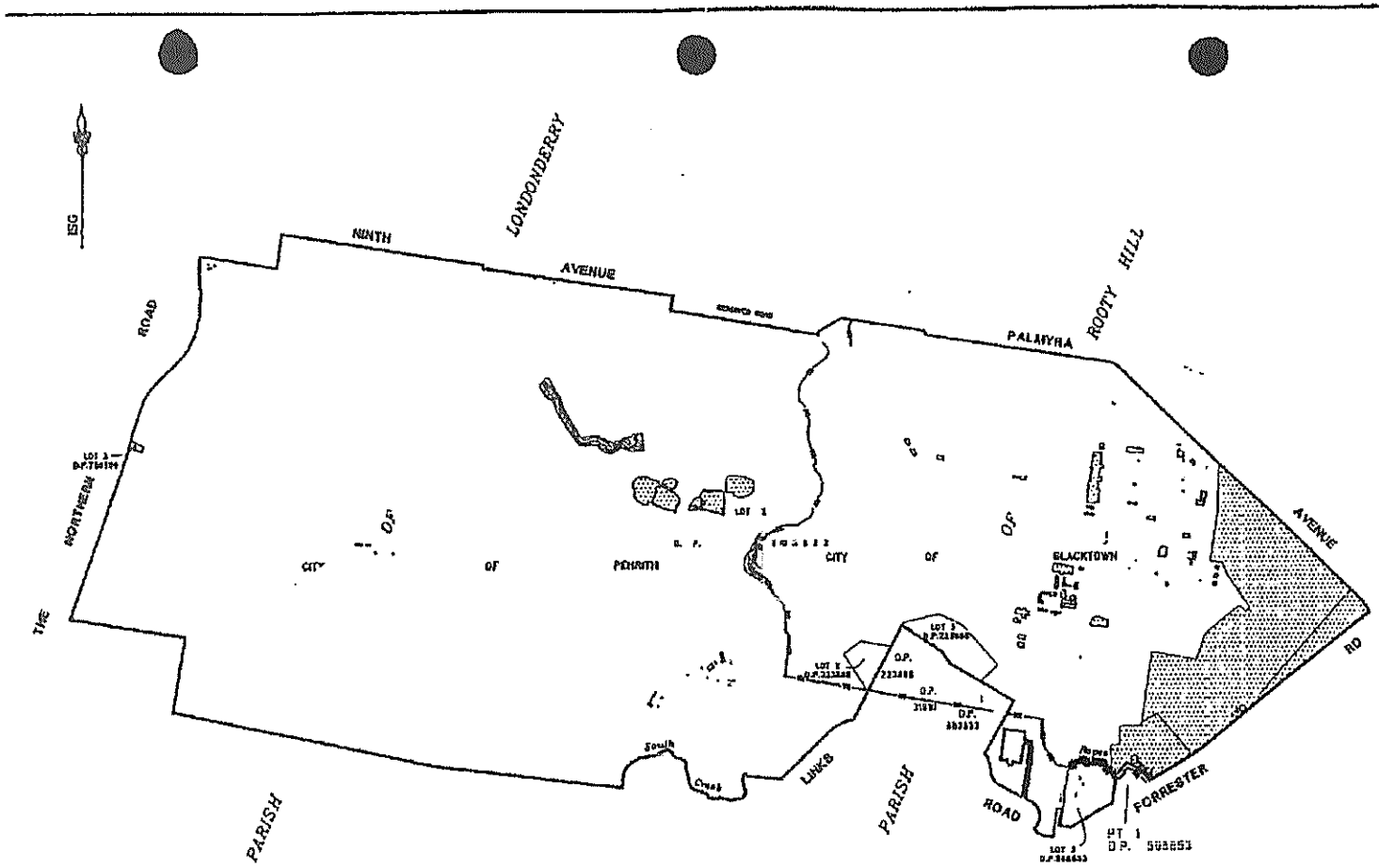
(a) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and

(b) this statement is to the best of my knowledge, true, accurate and complete. and

(c) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed: _____ Date: 7/6/99



SHADED AREAS ARE EXCLUDED FROM AUDIT STATEMENT CHK001/1

NOTE :

GEOMETRY SHOWN AS SUPPLIED BY ADI LIMITED TO DNR OFFICE 12.5.1998

FOR SITE DETAILS ON EXCLUDED AREAS PLEASE REFER TO DRAWINGS

5467-123
5467-125
5467-126
5467-127
5467-128
5467-129
5467-130
5467-131
5467-132
5467-133
5467-134
5467-135

NOTES:

PREPARED BY:

Whelans
Surveyors
Planners
Geomatic Engineers

Whelans Australia Pty Ltd

Head Office:
Whelans Australia Pty Ltd
Level 5, 141 Elizabeth Street
Sydney, New South Wales.
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Parramatta Office:
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12 Victoria Road, Parramatta.
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Telephone 02) 9630 4199
Facsimile 02) 9630 4599

PREPARED FOR:

ADI Property

ADI ST MARYS PROPERTY PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/1

ORIGINAL SIZE: A3	
SCALE HOR: 1 : 25 000	VERT: -
CO-ORDS: ISG	DATUM: -
DATE OF SURVEY	DATE OF PLAN: 11 May 1998
SURVEY -	DRAWN Acad/MTB
CHECKED: MTB	DATE 24.5.1998
APPROVED: PW	DATE 24.5.1998
JOB REF: 8662	
CAD REF: 5467-122.DWG	SHEET 1 OF 13 SHEETS

NSW Environment Protection Authority
SITE AUDIT STATEMENT (SAS)

Site Audit Statement No.: CHK001/6

Site Auditor (accredited under NSW Contaminated Land Management Act 1997):

Name: Christopher H Kidd Company: HLA-Envirosciences Pty Limited
Address: 55-65 Grandview Street, Pymble, NSW Postcode: 2076
Phone: (02) 9988 4422 Fax: (02) 9988 4441

Site Details

ADI St. Marys Property – existing buildings and paved areas scattered about the site.
Address: Forrester Road, St. Marys Postcode: 2760
Lot and DP Number: Lot 2 in DP803832
Lot 2 and 3 in DP223888 (part of)
Lot 3 in DP789196
Lot 3 in DP598653
(see attached 7 maps)
Local Government Area: Penrith and Blacktown

Site Audit requested by:

Name: Mr P Newton Company: Department of Urban Affairs and Planning
Address: Sydney Region West
Level 8, Signature Tower
2-10 Wentworth Street
Parramatta NSW 2150
Phone: (02) 9895 7142 - Fax: (02) 9895 6270

Name of contact person (if different from above:

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

- ADI Limited — Chemical and Explosives Ordnance Investigations, Remediation and Validation 1990 - 1999
- Mackie Martin & Associates — Groundwater Investigations, 1991

Title(s) of Report(s) reviewed:

11. Historical Report St Marys Property, ADI Limited, 1996;
12. Validation Report for the Western Sector, ADI St Marys Facility, ADI Limited November 1994;
13. Validation Report for the North Western Sector of the ADI St Marys Facility, Report No. 498800, ADI Limited 1995;
14. Validation Report for the Southern Sector West of the ADI St Marys Property, Report No. 498810, ADI Limited 1996;

15. Validation Report for the Southern Sector East of the St Marys Property, Report No. 498810, ADI Limited 1996;
16. Validation Report for the Northern Sector of the ADI St Marys Property, Report No. 498820, ADI Limited 1996;
17. Validation Report for the Cental Sector East of the ADI St Marys Property, Report No. 498840, ADI Limited 1997;
18. Validation Report for the Central Sector West of the ADI St Marys Property, Report No. 498840, ADI Limited 1996;
19. Validation Report for the North Eastern Sector of the ADI St Marys Property, Report No. 498850, ADI Limited 1996;
20. QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.

Other Information reviewed:

6. Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.
7. Remediation Action Plan for the Northern Sector, ADI St Marys Facility, Report No. 498820, ADI Limited 1996;
8. Remediation Action Plan for Central Eastern Sector, ADI St Marys Facility, Report No. 498840, ADI Limited 1996;
9. Remediation Action Plan for the Eastern Sector of the ADI St Marys Property, Report No. 498830, ADI Limited 1996;
10. Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

Summary Site Audit Report Title:

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick all appropriate boxes)

(a) is suitable for the following use(s):

- ☐ ~~residential, including substantial vegetable garden and poultry;~~
- ☐ ~~residential, including substantial vegetable garden, excluding poultry;~~
- ☐ ~~residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry;~~
- ☐ ~~residential with minimal opportunity for soil access including units;~~
- ☐ ~~daycare centre, preschool, primary school;~~
- ☐ ~~secondary school;~~
- ☐ ~~parks, recreational open space, playing field;~~
- ✓ commercial/industrial use;
- ✓ Other – May continue to be used for existing commercial use and carparks, but underlying soils need to be tested for chemical and ordnance contamination after demolition.

subject to

✓ Conditions

1. Soils under existing buildings, car parks, roads and the concrete stockpile shall be tested for ordnance and/or chemical contamination when these facilities are removed; site audits statements for these areas will also be required.
2. An appropriate management plan, including procedures for the safe handling and disposal of any items of ordnance that may be found during earthworks, should be lodged prior to the commencement of development earthworks. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).

~~(b) is not suitable for any beneficial use due to risk of harm from contamination~~ ☐ ~~(comments):~~

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a Site Auditor (Accreditation No. 9813).

I Certify that:

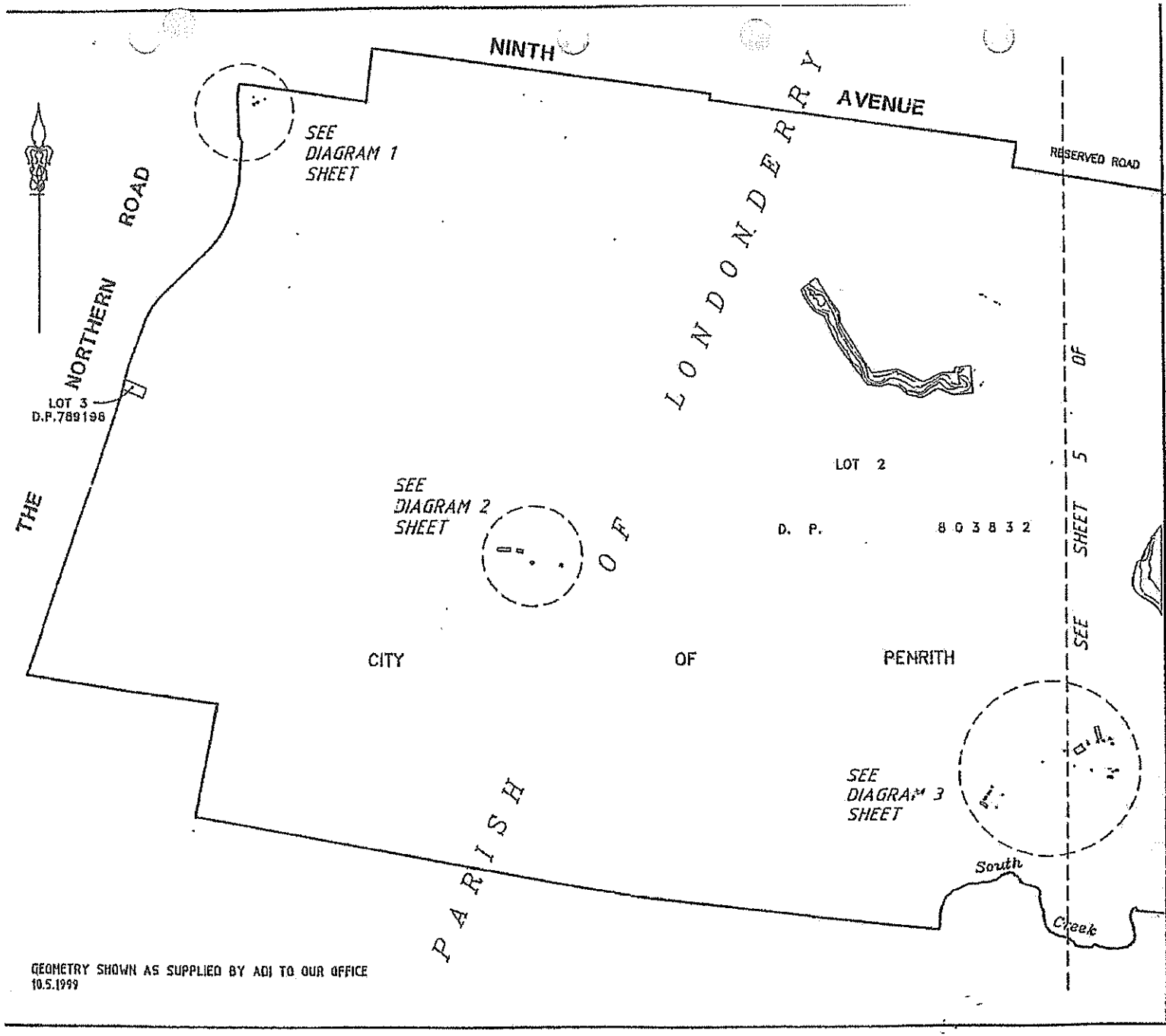
(a) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and

(b) this statement is to the best of my knowledge, true, accurate and complete, and

(c) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed: _____ Date: 7/6/99



NOTES:

PREPARED BY:

Whelans — Surveyors, Planners, Geomatic Engineers

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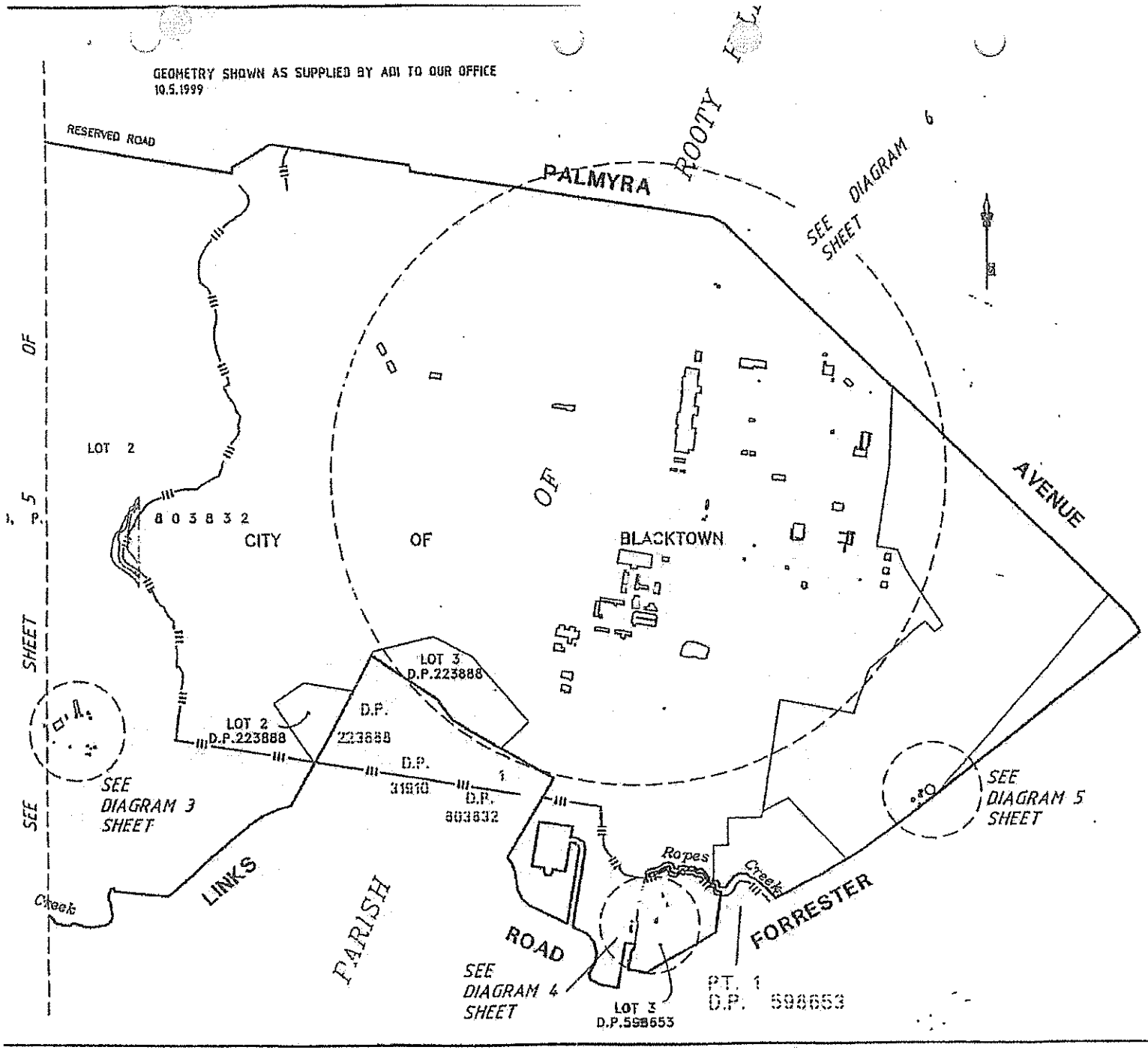
Facsimile 02) 9630 4693

PREPARED FOR:

ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

ORIGINAL SIZE:	A3
SCALE HOR: 12500	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: 10 MAY 1999
SURVEY	DRAWN DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 8662	
CAD REF: 5467-126	SHEET 7 OF 13 SHEETS



NOTES:

PREPARED BY:

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Facsimile 02) 9630 4599

PREPARED FOR:

ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

ORIGINAL SIZE: A3

SCALE HOR: 12500	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: 10 MAY 1999
SURVEY	DRAWN DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 6502	
CAD REF: 5467-125	SHEET 6 OF 13 SHEETS

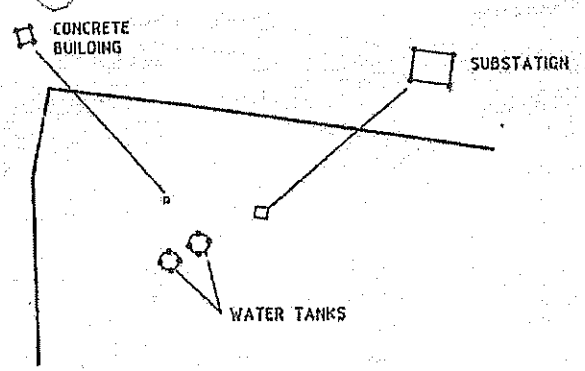

DIAGRAM 1

CONCRETE BUILDING	274588 1267987 274590 1267987 274590 1267985 274588 1267985
SUBSTATION	274625 1267979 274626 1267983 274631 1267982 274630 1267978
WATERTANK	274606 1267968 274603 1267964 274598 1267968 274602 1267972.
WATERTANK	274589 1267965 274586 1267960 274591 1267957 274594 1267960
K6	275465 1266407 275425 1266410 275426 1266422 275466 1266419
K2	275507 1266403 275487 1266407 275488 1266416 275508 1266413
CARETAKERS SHED	275532 1266368 275537 1266377 275546 1266373 275541 1266364
K4	275642 1266357 275635 1266360 275637 1266367 275645 1266364

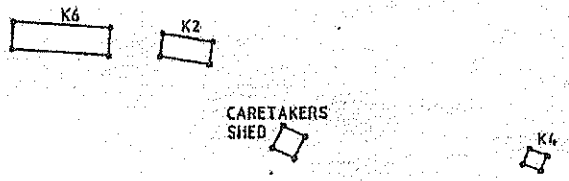

DIAGRAM 2

COORDINATES ARE APPROXIMATE ONLY

GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE 10.5.1999

NOTES:

PREPARED BY:

Whelans — Surveyors, Planners, Geomatics Engineers

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NSW 2150
Telephone 02) 9630 4199
Facsimile 02) 9630 4599

PREPARED FOR:
ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

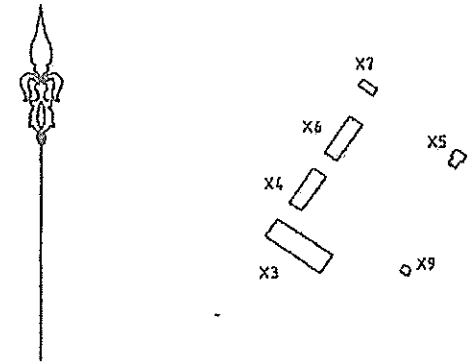
ORIGINAL SIZE:	A3
SCALE HOR: 2000	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN: DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 8662	
CAD REF: 5467-127	SHEET 9 OF 13 SHEETS

BDG No	EASTING	NORTHING
X7	277113	1265596
	277111	1265594
	277105	1265598
	277107	1265601
X6	277106	1265581
	277101	1265585
	277091	1265570
	277096	1265566
X4	277076	1265549
	277082	1265545
	277091	1265559
	277086	1265563
X3	277067	1265535
	277072	1265542
	277094	1265527
	277089	1265520
X9	277127	1265521
	277125	1265518
	277122	1265520
	277124	1265523
X5	277142	1265565
	277145	1265563
	277150	1265568
	277145	1265571

BDG No	EASTING	NORTHING
W01	277452	1265655
	277456	1265654
	277457	1265658
	277453	1265658
W04	277475	1265762
	277481	1265760
	277479	1265755
	277474	1265756
	277493	1265765
	277500	1265764
	277499	1265759
	277492	1265760
W05	277433	1265729
	277407	1265712
	277395	1265731
	277418	1265746
	277444	1265749
	277440	1265755
	277444	1265758
	277448	1265751
	277399	1265671
	277397	1265674
	277395	1265672
	277396	1265670
	277360	1265728
	277365	1265731
	277368	1265725
	277363	1265723

BDG No	EASTING	NORTHING
TOILET	277519	1265773
	277521	1265766
	277516	1265765
	277514	1265772
POWER	277283	1265688
	277285	1265686
	277287	1265685
	277286	1265691
W11	277477	1265767
	277468	1265805
	277480	1265811
	277489	1265770
SHED	277439	1265759
	277437	1265763
	277439	1265764
	277441	1265761
CONTROL TOWER	277453	1265658
	277511	1265634
	277527	1265632
	277526	1265626

BDG No	EASTING	NORTHING
W09	277529	1265648
	277530	1265651
	277524	1265652
	277524	1265650
	277513	1265658
	277513	1265661
	277520	1265662
	277520	1265659
W02	277453	1265658
	277511	1265634
	277527	1265632
	277526	1265626
	277536	1265658
	277536	1265652
	277546	1265653
	277546	1265659



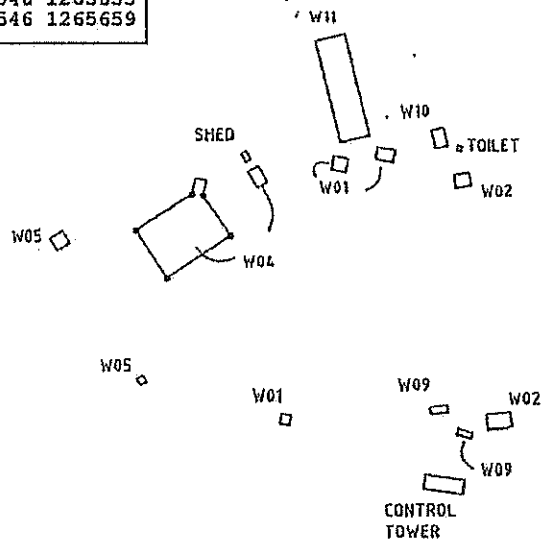


DIAGRAM 3

NOTES:

PREPARED BY:

Whelans — Surveyors, Planners, Geomatics Engineers

Whelans Australia Pty Ltd

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NSW 2150
Telephone 02) 9630 4199
Facsimile 02) 9630 4599

PREPARED FOR:
ADI PROPERTY

ADI ST MARYS PROPPERTY
RETAINED BUILDINGS & PAVED AREA
PLAN TO ACCOMPANY SITE
AUDIT STATEMENT CHK001/0

ORIGINAL SIZE: A3	
SCALE HOR: 2000	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN: DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 8662	
CAD REF: 5467-128	SHEET 10 OF 13 SHEETS

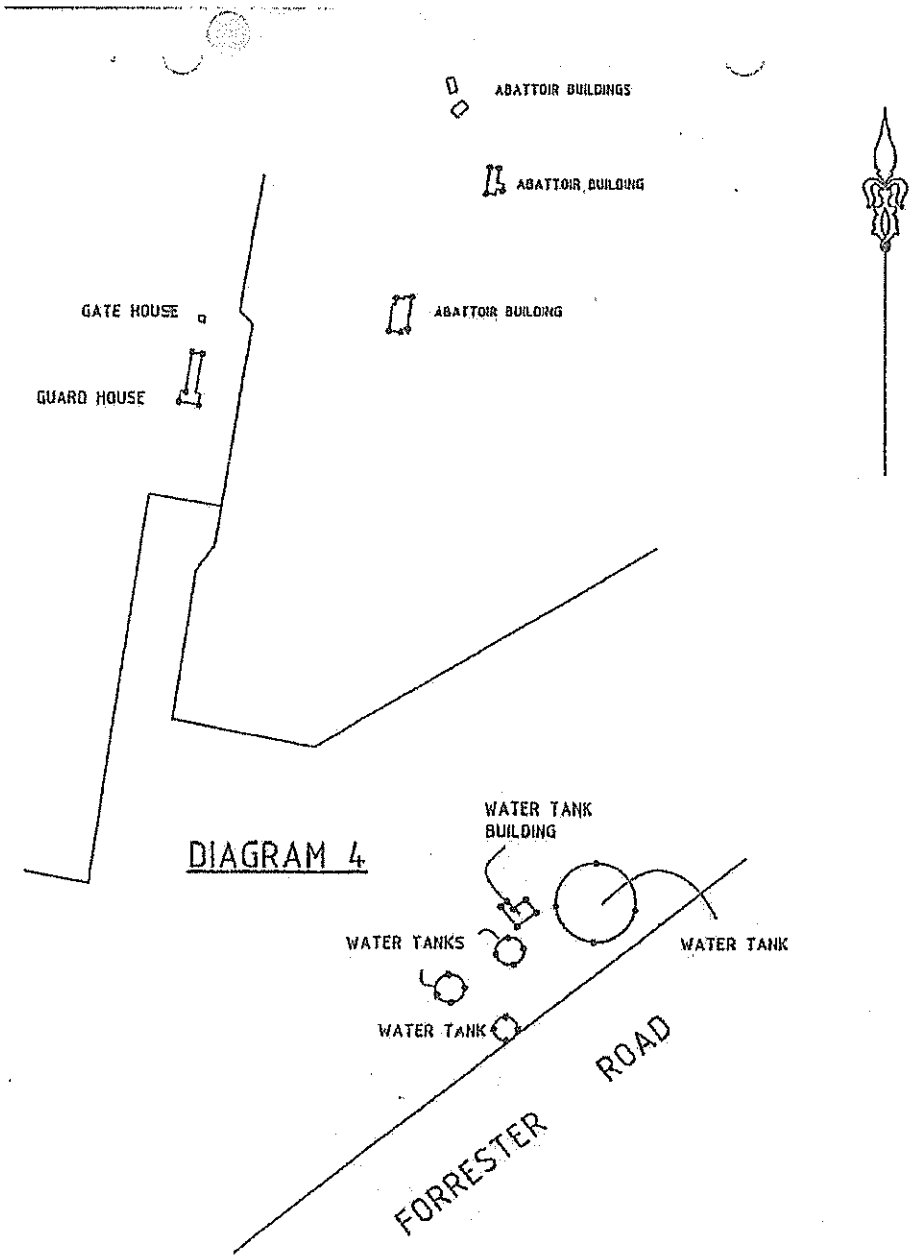

DIAGRAM 4

DIAGRAM 5

COORDINATES ARE APPROXIMATE ONLY

GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE 10.5.1999

BDG No	EASTING	NORTHING
WATER TANK BUILDING	280335	1265484
	280349	1265492
	280351	1265494
	280354	1265491
	280359	1265495
WATER TANKS	280389	1265510
	280403	1265494
	280385	1265477
	280371	1265496
	280357	1265477
	280358	1265474
	280350	1265468
	280347	1265475
	280326	1265452
	280322	1265458
	280334	1265459
	280330	1265464
	280354	1265445
	280356	1265441
	280347	1265444
	280349	1265436
GATE HOUSE	279372	1265033
	279375	1265032
	279372	1265030
	279374	1265030
GUARD HOUSE	279369	1265017
	279374	1265016
	279372	1264995
	279364	1264997
	279366	1265001
ABATTOIR BUILDINGS	279459	1265041
	279453	1265040
	279450	1265027
	279454	1265026
	279457	1265027
	279491	1265094
	279495	1265093
	279489	1265083
	279496	1265084
	279473	1265130
	279476	1265131
	279478	1265125
	279475	1265124
	279475	1265117
	279480	1265121
	279482	1265118
	279478	1265114

NOTES:

PREPARED BY:

Whelans
Surveyors
Planners
Cremalia Engineers
Whelans Australia Pty Ltd

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Telephone 02) 9630 4199
Facsimile 02) 9630 4599

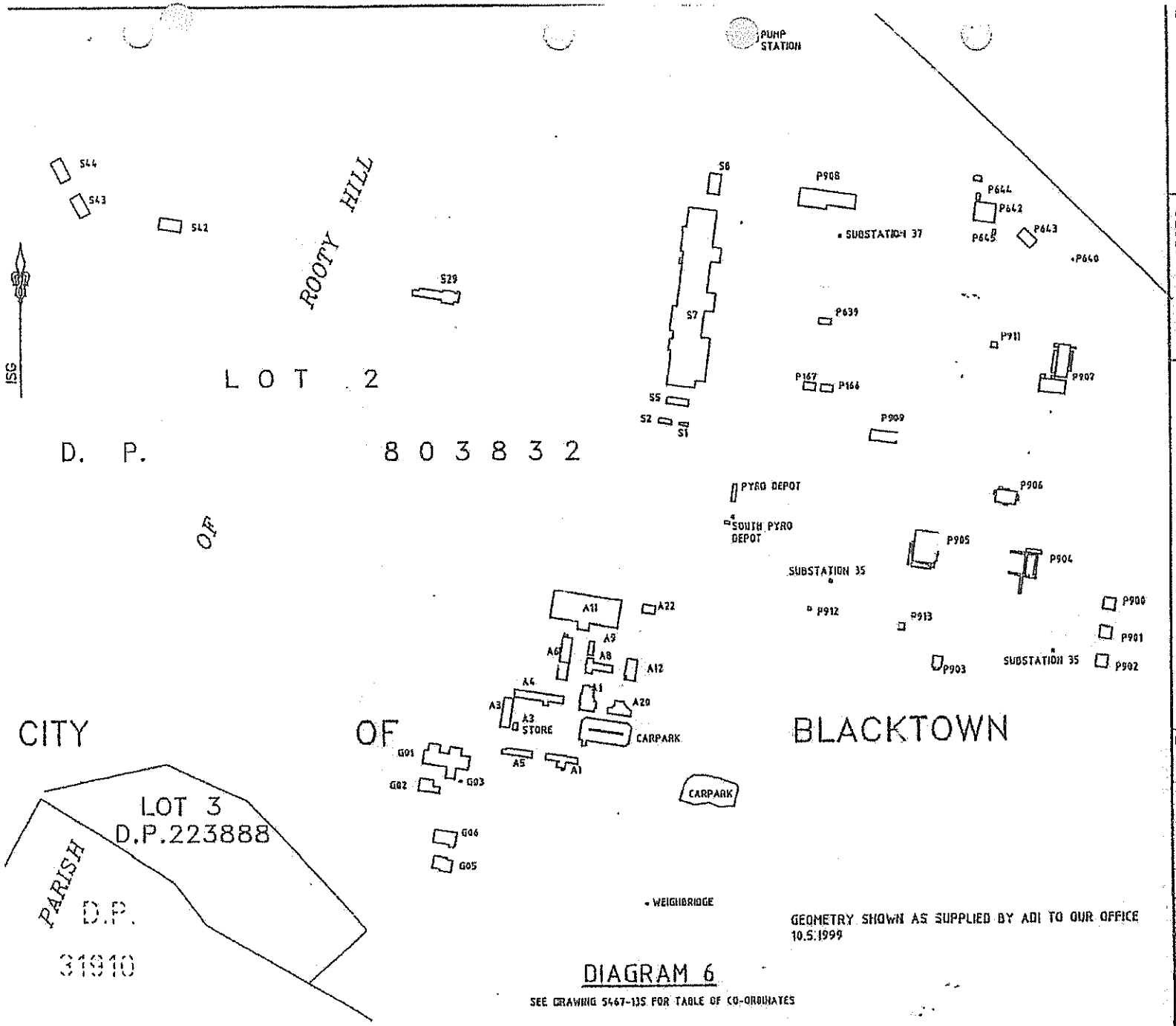
PREPARED FOR:

ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

ORIGINAL SIZE: A3

SCALE HOR: 2000	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN ACAD/DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 8662	
CAD REF: 5467-129	SHEET 11 OF 13 SHEETS



GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE 10.5.1999

DIAGRAM 6

SEE DRAWING 5467-13S FOR TABLE OF CO-ORDINATES

NOTES:

PREPARED BY:

Whelans — Surveyors, Planners, Geomatic Engineers

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Facsimile 02) 9630 4599

PREPARED FOR:

ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

ORIGINAL SIZE: A3	
SCALE HOR: 6000	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN ACAD/DDW
CHECKED: DDW	DATE 24.5.1999
APPROVED: PW	DATE 24.5.1999
JOB REF: 8662	
CAD REF: 5467-13A	SHEET 12 OF 13 SHEETS

BDG NO	EASTING NORTHING
A11	279334 1266254 279340 1266297 279449 1266279 279442 1266237
A22	279484 1266274 279505 1266270 279503 1266258 279482 1266261
A9	279398 1266217 279406 1266215 279403 1266194 279394 1266195
A8	279394 1266191 279435 1266178 279402 1266172 279390 1266168
A6	279344 1266158 279359 1266155 279370 1266222 279354 1266224
A4	279276 1266141 279274 1266129 279353 1266117 279355 1266128
A3	279260 1266128 279274 1266126 279266 1266077 279252 1266079
A3 STORE	279273 1266086 279271 1266074 279281 1266085 279279 1266073
A5	279302 1266026 279304 1266037 279262 1266043 279254 1266033
A1	279324 1266023 279326 1266033 279377 1266025 279357 1266017 279342 1266010
A7	279380 1266107 279404 1266108 279405 1266143 279387 1266146
A22	279454 1266162 279455 1266155 279470 1266153 279475 1266167
A12	279425 1266100 279462 1266094 279453 1266119 279437 1266113

BDG NO	EASTING NORTHING
CAR/ PARK	279567 1265995 279556 1265990 279542 1265953 279567 1265945 279606 1265940 279631 1265942 279640 1265975 279609 1265990
CAR/ PARK	279391 1266093 279384 1266089 279379 1266056 279383 1266046 279453 1266044 279464 1266076
G01	279203 1266029 279200 1266006 279178 1265991 279126 1266018 279138 1266052
G02	279144 1265979 279145 1265969 279122 1265993 279119 1265972 279153 1265966
G06	279142 1265881 279146 1265903 279182 1265897 279177 1265871
G05	279174 1265850 279171 1265829 279141 1265838 279144 1265854
S42	278527 1267007 278511 1266998 278529 1266966 278545 1266974
S43	278570 1266916 278560 1266949 278544 1266939 278562 1266907
S44	278729 1266884 278732 1266883 278696 1266989 278693 1266990
S29	279324 1266023 279326 1266033 279377 1266025 279376 1266015
S8	279618 1266979 279614 1266941 279595 1266944 279600 1266976
S7	279564 1266923 279611 1266916 279524 1266631 279588 1266639

BDG NO	EASTING NORTHING
S5	279525 1266609 279523 1266598 279560 1266592 279561 1266604
S2	279533 1266570 279511 1266573 279510 1266565 279531 1266562
S1	279192 1266788 279189 1266769 279114 1266781 279115 1266791
RAIL/ WAY	279599 1266565 279580 1266465 279575 1266465 279605 1266652
P908	279750 1266952 279746 1266923 279837 1266917 279840 1266939
SUB/ ST 37	279010 1266872 279014 1266872 279814 1266876 279814 1266876
P639	279593 1266784 279608 1266782 279604 1266752 279589 1266753
P167	279772 1266631 279770 1266618 279752 1266621 279753 1266634
P166	279799 1266627 279798 1266615 279779 1266617 279781 1266630
P909	279860 1266552 279858 1266533 279900 1266528 279902 1266546
P900	280258 1266276 280239 1266278 280236 1266259 280255 1266257
P901	280251 1266231 280232 1266234 280229 1266215 280248 1266212
P902	280245 1266186 280242 1266167 280223 1266170 280226 1266189
P903	279973 1266187 279959 1266189 279971 1266170 279957 1266172

BDG NO	EASTING NORTHING
SUBSTATION 35	280151 1266194 280155 1266193 280156 1266197 280152 1266198
P913	279792 1266307 279792 1266311 279796 1266310 279796 1266306
P912	279910 1266231 279902 1266231 279903 1266241 279913 1266240
P904	279763 1266268 279763 1266262 279757 1266263 279758 1266268
P905	280136 1266352 280111 1266355 280105 1266311 280125 1266309
P906	279931 1266385 279967 1266380 279924 1266329 279960 1266327
P907	280063 1266452 280096 1266448 280093 1266427 280060 1266431
P911	280186 1266690 280135 1266636 280178 1266637 280178 1266637 280135 1266636 280177 1266631 280174 1266609 280165 1266681
P640	280056 1266698 280066 1266697 280065 1266687 280055 1266689
P642	280192 1266831 280190 1266832 280189 1266831 280190 1266829
P643	280063 1266923 280032 1266927 280028 1266896 280058 1266892
P644	280111 1266883 280133 1266862 280120 1266850 280099 1266870
	280039 1266929 280032 1266930 280034 1266940 280040 1266939 280041 1266958 280029 1266960 280030 1266966 280031 1266966

NO	EASTING NORTHING
P645	280059 1266871 280060 1266881 280065 1266880 279799 1266627
PYRO DEPOT	279634 1266465 279630 1266436 279637 1266435 279641 1266464
SOUTH PYRO DEPOT	279634 1266408 279631 1266408 279631 1266413 279635 1266412 279619 1266399 279628 1266398 279629 1266402 279619 1266404
WEIGH/ BRIDGE	279487 1265773 279484 1265774 279485 1265777 279488 1265776

TABLE OF CO-ORDINATES OF RETAINED BUILDINGS AND PAVED AREA

COORDINATES ARE APPROXIMATE ONLY

NOTES:

PREPARED BY:

Whelans — Surveyors, Planners, Geomatic Engineers

Whelans Australia Pty Ltd

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Facsimile 02) 9261 5012

Parramatta Office:
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12 Victoria Road, Parramatta.
NSW 2150
Telephone 02) 9630 4199
Facsimile 02) 9630 4599

PREPARED FOR:

ADI PROPERTY

ADI ST MARYS PROPERTY RETAINED BUILDINGS/PAVED AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/6

ORIGINAL SIZE: A3

SCALE: HOR:	VERT:
CO-ORDS:	DATUM:
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN: ACAD/DDW
CHECKED: DDW	DATE: 24.5.1999
APPROVED: PW	DATE: 24.5.1999
JOB REF: 8662	
CAD REF: 5467-135	SHEET 13 OF 13 SHEETS

NSW Environment Protection Authority

SITE AUDIT STATEMENT (SAS)

Site Audit Statement No.: CHK001/7

Site auditor (accredited under NSW Contaminated Land Management Act 1997):

Name: Christopher H Kidd Company: HLA-Envirosciences Pty Limited
Address: 55-65 Grandview Street, Pymble, NSW Postcode: 2076
Phone: (02) 9988 4422 Fax: (02) 9988 4441

Site Details

ADI St. Marys Property –Concrete Stockpile
Address: Forrester Road, St. Marys Postcode: 2760
Lot and DP Number: Lot 2 in DP803832 (part of)
(see attached map)
Local Government Area: Penrith and Blacktown

Site Audit requested by:

Name: Mr P Newton Company: Department of Urban Affairs and Planning
Address: Sydney Region West
Level 8, Signature Tower
2-10 Wentworth Street
Parramatta NSW 2150
Phone: (02) 9895 7142 - Fax: (02) 9895 6270

Name of contact person (if different from above:

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

- ADI Limited — Chemical and Explosives Ordnance Investigations, Remediation and Validation 1990-1999
- Mackie Martin & Associates — Groundwater Investigations, 1991

Title(s) of Report(s) reviewed:

4. Historical Report – St Marys Property, ADI Limited, 1996;
5. Validation Report for the Central Sector West of the ADI St Marys Property, Report No. 498840, ADI Limited 1996;
6. QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.

Other Information reviewed:

3 Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.
4 Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

Summary Site Audit Report Title:

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick all appropriate boxes)

(a) is suitable for the following use(s):

- ☐ ~~residential, including substantial vegetable garden and poultry;~~
- ☐ ~~residential, including substantial vegetable garden, excluding poultry;~~
- ☐ ~~residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry;~~
- ☐ ~~residential with minimal opportunity for soil access including units;~~
- ☐ ~~daycare centre, preschool, primary school;~~
- ☐ ~~secondary school;~~
- ☐ ~~park, recreational open space, playing field;~~
- ☐ ~~commercial/industrial use;~~
- ✓ Other – May continue to be used as stockpile for crushed concrete, but underlying soils need to be tested for chemical and ordnance contamination after stockpile removed.

subject to

- ✓ Conditions

1. On removal of all or part of the stockpile the underlying ground should be tested for both chemical and ordnance contamination. The testing should follow similar methods and levels of quality assurance as other parts of the ADI St Marys site. Appropriate remediation and validation should be performed (if necessary) the work reviewed by a site auitor.
3. Appropriate management plan including procedures for the safe handling and disposal of any items of explosive ordnance, shall be in place before development earthworks commences and shall remain in place to cover any excavation on the site during its ongoing use. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).
4. The final surface of any earthworks in areas which are to be used for active recreational land uses, e.g. sports grounds, school grounds and picnic areas, or low density residential use, should, on completion of the earthworks, be surveyed with a metal detector by appropriately qualified and experienced personnel and the work reviewed by an independent site auditor.

~~(c) is not suitable for any beneficial use due to risk of harm from contamination~~

- ☐ ~~(comments): ...~~

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a Site Auditor (Accreditation No. 9813).

I Certify that:

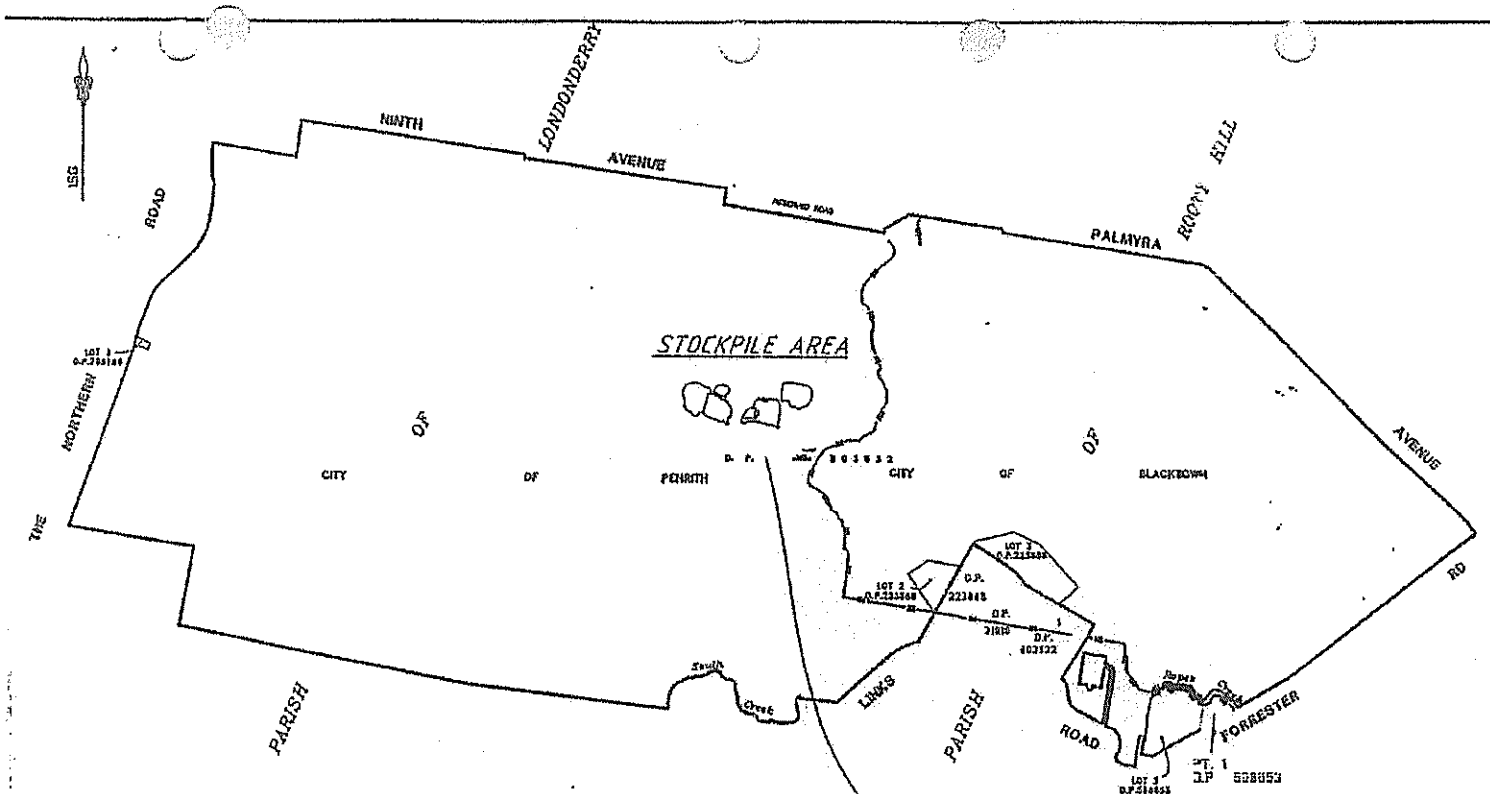
(g) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and

(h) this statement is to the best of my knowledge, true, accurate and complete, and

(i) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed: _____ Date: 7/6/99



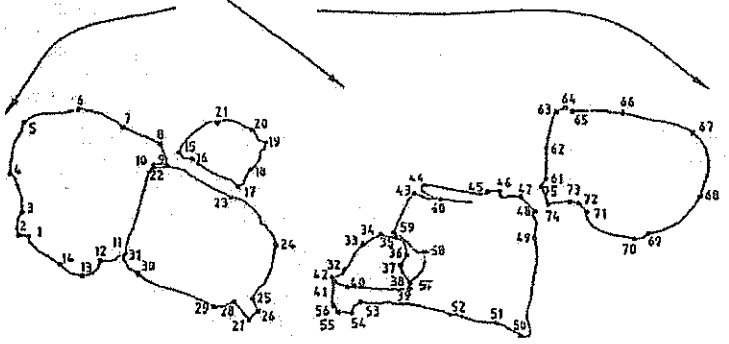
No	EASTING	NORTHING
	277 000	1 266 663
	277 000	1 266 664
	277 003	1 266 687
	276 991	1 266 727
	277 005	1 266 779
	277 056	1 266 793
	277 098	1 266 775
	277 133	1 266 759
	277 140	1 266 738
	277 127	1 266 730
	277 101	1 266 639
	277 070	1 266 639
	277 060	1 266 624
	277 039	1 266 635
	277 151	1 266 751
	277 184	1 266 744
	277 208	1 266 715
	277 220	1 266 733
	277 235	1 266 761
	277 222	1 266 744
	277 188	1 266 780
	277 123	1 266 730
	277 201	1 266 704
	277 245	1 266 656
	277 254	1 266 602
	277 254	1 266 602
	277 219	1 266 583
	277 206	1 266 599
	277 186	1 266 595
	277 113	1 266 627

No	EASTING	NORTHING
31	277 099	1 266 642
32	277 109	1 266 632
33	277 126	1 266 657
34	277 144	1 266 668
35	277 158	1 266 664
36	277 168	1 266 647
37	277 162	1 266 636
38	277 171	1 266 661
39	277 171	1 266 613
40	277 112	1 266 614
41	277 299	1 266 620
42	277 296	1 266 624
43	277 315	1 266 709
44	277 385	1 266 709
45	277 447	1 266 711
46	277 458	1 266 711
47	277 439	1 266 706
48	277 493	1 266 691
49	277 493	1 266 644
50	277 484	1 266 567
51	277 456	1 266 581
52	277 419	1 266 588
53	277 324	1 266 600
54	277 315	1 266 590
55	277 303	1 266 591
56	277 297	1 266 599
57	277 321	1 266 613
58	277 385	1 266 650
59	277 356	1 266 670
60	277 400	1 266 703

No	EASTING	NORTHING
61	277 504	1 266 725
62	277 504	1 266 757
63	277 514	1 266 793
64	277 523	1 266 797
65	277 530	1 266 793
66	277 528	1 266 791
67	277 652	1 266 766
68	277 655	1 266 717
69	277 603	1 266 678
70	277 590	1 266 664
71	277 544	1 266 691
72	277 536	1 266 700
73	277 528	1 266 701
74	277 566	1 266 699
75	277 439	1 266 716

COORDINATES ARE APPROXIMATE ONLY

GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE 10.5.1999



STOCKPILE AREA
NOT TO SCALE

NOTES:

PREPARED BY:

Whelans
Surveyors
Planners
Geomatic Engineers

Whelans Australia Pty Ltd

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Facsimile 02) 9630 4599

PREPARED FOR:

ADI Property

ADI ST MARYS PROPERTY STOCKPILE AREA PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/7

ORIGINAL SIZE: A3

SCALE HOR:	1 : 25,000	VERT:	–
CO-ORDS:	ISG	DATUM:	–
DATE OF SURVEY		DATE OF PLAN:	11 May 1999
SURVEY	–	DRAWN	Acad/DW
CHECKED:	DDW	DATE	24.5.1999
APPROVED:	PW	DATE	24.5.1999
JOB REF:	8662		
CAD REF:	8662-133.DWG	SHEET 6	OF 13 SHEETS

Douglas Partners
Geotechnics / Environment / Groundwater

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Smeaton Grange NSW 2567
Phone (02) 4647 0075
Fax (02) 4646 1886

Lend Lease Communities (Australia) Pty Ltd
Level 2, 88 Phillip Street
PARRAMATTA NSW 21254

Project 92245.00
21 September 2017
R.001.Rev0
GAR

Attention: Mr Paul Thomspon

Email: paul.thompson@lendlease.com

Dear Sirs

Site Walkover Contamination Report
Proposed Residential Subdivision
Proposed Lots 3989, 3990 and 3991, DP 1190132, Jordan Springs, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by Lend Lease Communities (Australia) Pty Ltd (LLC) to complete a Site Walkover Contamination Report for the property comprising Lots 3989, 3990 and 3991 in Deposited Plan (DP) 1190132 at Jordan Springs NSW (the site). It is understood that the site, part of the Western Precinct of the former Australian Defence Industries (ADI) property, was subject to extensive investigations during the 1990s which included assessing the suitability of the land for residential redevelopment. A site audit statement produced in 1999 considered that the majority of the western precinct posed a negligible risk to the public with regard to contamination and /or explosive ordinance.

It is also understood that having previously developed and then sold the site in June 2013 to another developer, LLC are considering re-purchasing the site. A site walkover was required as part of due diligence investigations to identify additional activities or sources that have occurred/appeared on site since the sale of the property with the potential for land contamination. DP have not undertaken review of works associated with land whilst in LLC's ownership.

A plan of showing the subject site is attached.

2. Scope of Works

The scope completed for site walkover was as follows:

- Review of a Contamination Management Plan (CMP) produced by URS Australia Pty Ltd in 2008. The report was provided by LLC. The CMP included the 1999 Site Audit Statement. The review of CMP was completed to ascertain the contamination status of the site at time of site audit;
- Limited review of historical aerial imagery (from 2013) to identify additional areas on site where potential contamination may have occurred since the sale of the property;

- Inspection of the site to assess the potential for contamination;
- Photographing of the site for recording purposes;
- Preparation of this Site Walkover Contamination report.

3. Summary of Reviewed Documentation

3.1 URS (2008) Contamination Management Plan

A CMP was completed for the Western Precinct, which included the site, by URS Australia Pty Ltd in July 2008 to support lodgement of the Western Precinct Plan. The objective of the CMP was to provide a framework for identifying and addressing any discovery of chemical contamination or potentially explosive ordnance so as to ensure a safe working environment for workers during development and to avoid unacceptable impact on the natural environment.

The CMP described that the site had been subject to extensive investigations during the 1990s which included a site audit statement issued in 1999 for the western precinct. The investigation and remediation programs for the property were undertaken with the objective of assessing the nature, degree of chemical contamination and remediation to a level suitable for redevelopment for a variety of land uses including residential. The majority of the western precinct was assessed by the site auditor to pose a negligible risk to the public or the environment with regards to chemical contamination and/or explosive ordnance.

3.2 Other Documents

DP are aware that there is a large body of pre-existing work on the site. DP were not provided any other documents to review and due to the timeframe were unable to obtain any further documents for review.

4. Limited Historical Aerial Review

A limited review of recent Nearmap Aerial Photography (from May 2013 onwards) was undertaken to identify areas onsite where potential for site contamination may have occurred in recent years. A summary of the review of historical aerial photography is detailed below.

May 2013 – The site appears to be vacant land which is partially covered by remnant bushland. A large grass covered area cleared of native vegetation is evident in the western portion of the site (Lot 3990) and another grass covered cleared area evident in the north eastern portion of the site (Lot 3989). An asphalt sealed car park has been developed in the central northern portion (Lot 3991) of the site adjacent to the site's northern boundary. An unsealed track runs from the carpark through the central portion of the site in a north - south. A long soil stockpile of limited height is located in the south eastern portion of the site that appears to be used for erosion control and likely created from reworked natural soils. The central portion of the site is generally covered by bushland. A large dam is located in the eastern portion of the site (Lot 3989). Areas in the far north eastern and eastern portions of the site appear to be used as a compound for nearby subdivision works on adjacent properties to the east of the site.

Areas to the north and northeast of the site beyond Jordan Springs Boulevard appear to be undergoing residential development. Areas to the south and immediate west of the site appear to be covered by bushland. A large wetland is evident to the immediate south of the central portion of the site. Areas to the far west of the site have been developed as residential.

June 2014 – The site and immediate surrounds appear similar to the previous aerial image.

March 2015 – The site and immediate surrounds appear similar to the previous aerial image.

May 2016 – The site and immediate surrounds appear similar to the previous aerial image.

February 2016 – An unsealed track running diagonally from the central northern portion of the site towards the south eastern portion of the site appears. The remainder of the site and immediate surrounds appear similar to the previous aerial image.

May 2017 – The unsealed track running diagonally through the site to the south eastern portion appears to have been increased in size and there appears to have been increased disturbance to sites soils in the central eastern portion of the site. The dam in the eastern portion (Lot 3989) of the site appears to have been filled. Bulk earthworks are occurring to the immediate south of the site which appear to be for a drainage system associated with the nearby developments to the east of the site and wetlands to the immediate south of the site. The unsealed track in the central eastern portion of the site appears to have been used as an access track for the bulk earthworks occurring for the drainage system.

September 2017 – The drainage system to the immediate south of the site appears to have been completed. The remainder of the site and immediate surrounds appear similar to the previous aerial image.

5. Site Walkover

The following site description is based on a site walkover completed on 19 September 2017. Photographs taken during the Site walkover and field works are presented in attached Photographic Plates 1 to 4.

The site is an irregular shaped property. At the time of inspection the site was vacant and partially covered with bushland and unsealed dirt tracks. The site is accessed via an asphalt sealed driveway in the central northern portion of Lot 3991 that leads from Jordan Springs Boulevard to the north of the site. The driveway leads to an asphalt/spray sealed carpark in the central northern portion of Lot 3991. An unsealed dirt track leads from the southern portion of the carpark towards the central and southern portions of the site. Five small stockpiles of soil were observed on the unsealed area immediately adjacent to the south eastern corner of the asphalt carpark. The stockpiles, with an approximate total volume of 15 - 20 m^3, were partially grass covered and appeared to be comprised of soil and small amounts of crushed sandstone and concrete.

The unsealed driveway branches to the immediate south of the stockpiles with one arm of the driveway heading towards the western portion of the site (Lot 3990) and the other heading towards the eastern portion (Lot 3989). The western track leads through bushland to a grass covered cleared area in the western portion of the site (Lot 3990). Minor refuse was noted (an abandoned shopping trolley was observed half way along the track and a several abandoned beer bottles were observed beneath a tree in the mostly cleared area). No other visible signs of anthropogenic material were observed in the western portion of the site.

The eastern track leads to a large cleared area in the eastern portion of the site (Lot 3989). A long soil stockpile of limited height was observed in the south eastern portion of the site that appeared to be comprised of reworked natural material. The stockpile appeared to be used for former erosion control by diverting water. To the east of the stockpile was an area of filling which covered an approximate area of 3000 m^2. The filling was observed to contain sand, clay, crushed sandstone and minor fragments of crushed concrete. With the exception crushed concrete no further anthropogenic material was observed within the fill.

6. Potential Sources of Contamination

Area of Filling in the Eastern Portion of the site (Lot 3989)

An area of filling was identified during site inspection in the eastern portion of the site. The filling covered an approximate area of 3000 m^2. The surface of the filling was observed to contain sand, clay, crushed sandstone and minor fragments of crushed concrete. Review of Nearmap Imagery indicates that the filling arrived on site to fill a dam in the eastern portion of the site sometime between November 2016 and May 2017. Correspondence (attached) with representatives of LLC has identified that the source of the material is the result of bulk earthworks associated with the drainage system located to the immediate south of the site. Given the site audit statement that the site and immediate surrounds pose a negligible risk to the public or the environment with regards to chemical contamination and/or explosive ordnance the potential for contamination to filling in the eastern portion of the site is considered to be low.

Small Soil Stockpiles in the central Northern Portion of the Site (Lot 3991)

Five small stockpiles of soil were observed during site walkover on the unsealed area immediately adjacent to the south eastern corner of the asphalt carpark which were partially grass covered and appeared to be comprised of soil and small amounts of crushed sandstone and concrete. The stockpiles had an approximate total volume of 15 - 20 m^3. Review of Nearmap imagery indicates that the stockpiles arrived on site sometime between August and December 2012 at a similar time as the construction of the carpark.

Whilst the stockpiles were likely created by earthworks associated with the car park the potential that the stockpiles were created as a result of illegal dumping or flytipping cannot be ruled out. Although potential for contamination of the soil within stockpiles exists given the volume the potential for widespread gross contamination of the site is considered to be low.

7. Conclusions and Recommendations

The previous 1999 site audit statement produced for the western precinct, which included the site, considered the area poses a negligible risk to the public or the environment with regards to chemical contamination and/or explosive ordnance. Limited review of historical aerial imagery and site walkover completed on 19 September 2017 has identified the following potential sources appearing onsite in recent years that have the potential for contamination of the site:

- An area of filling identified on Lot 3989 which covered an approximate total area of 3000 m^2 in the location of a former dam. Given correspondence with LLC stating that the material was sourced from nearby bulk earth works for the drainage basin to the south of the site the potential for contamination is therefore considered to be low; and
- Five small stockpiles of soil observed on the unsealed area immediately adjacent to the south eastern corner of the asphalt car park on Lot 3991. Given the small volume (15 - 20 m^3) of the stockpiles, likely origins from bulk earthworks associated with the nearby carpark and observed contents the soil within the stockpile poses a low contamination risk to the site.

It is recommended that further investigations be completed in due course of the filling on Lot 3989 and within the soil stockpiles on Lot 3991 to confirm the absence/presence of contaminants of potential concern associated with fill of an unknown origin.

With respect to site contamination the recommended further assessment should build on the information provided in this report with reference to National Environment Protection Council (NEPC, 1999) National Environment Protection Council (Assessment of Site Contamination) Measure 1999 (amended 2013) (NEPC, 2013). Further assessment should include intrusive investigations, sampling, analysis and assessment to determine land use suitability.

We trust that this meets your present requirements, please do not hesitate to contact the undersigned should you have any further enquiries.

Based on our walkover assessment the identified potential sources present a low risk of contamination and no significant source of contamination have been identified on the site since the sale of the property in June 2013. DP have not undertaken review of works associated with land whilst in LLC's ownership.

8. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lots 3989, 3990 and 3991 DP 1190132, Jordan Springs NSW in accordance with DP's proposal dated 15 September 2017 and acceptance received from Paul Thompson dated 15 September 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Lend Lease Communities Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the conditions on the site only at the time of works carried out. Conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during the reviewed investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

The limitations and notes included in the previous investigations are also relevant to this review.

Please contact the undersigned if you have any questions on this matter

Yours faithfully
Douglas Partners Pty Ltd

Grant Russell
Environmental Scientist

Reviewed by

Christopher Kline
Principal

Attachments: Subject Site Plan
Photographic Plates
Correspondence with Lend Lease Communities

Subject site:

Lot 3989
5,026m2

Lot 3990
2.345ha

Lot 3991
3.6ha

DP 1190132

Jordans Springs, (Penrith)

Photograph 1 - Asphalt sealed carpark in northern portion of site

Photograph 2 - Small soil stockpiles adjacent to south east corner of carpark

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs Site Walkover Lots 3989, 3990 and 3991 DP 1190132, Jordan Springs NSW	PROJECT: 92245.00 PLATE No. 1 REV: A
	CLIENT: Lend Lease Communities Pty Ltd	DATE: Sep-17

Photograph 3 - Native bushland covering central portion of site

Photograph 4 - Cleared grassed area in western portion of site

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs Site Walkover Lots 3989, 3990 and 3991 DP 1190132, Jordan Springs NSW CLIENT: Lend Lease Communities Pty Ltd	PROJECT:	92245.00
		PLATE No.	2
		REV:	A
		DATE:	Sep-17

Photograph 5 - Engineered drainage system located to the south of the site

Photograph 6 - Central eastern portion of site

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs Site Walkover Lots 3989, 3990 and 3991 DP 1190132, Jordan Springs NSW CLIENT: Lend Lease Communities Pty Ltd	PROJECT:	92245.00
		PLATE No:	3
		REV:	A
		DATE:	Sep-17

Photograph 7 - Filling in eastern portion of site

Photograph 8 - Filling observed in eastern portion of site

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs Site Walkover Lots 3989, 3990 and 3991 DP 1190132, Jordan Springs NSW	PROJECT: 92245.00 PLATE No: 4 REV: A
	CLIENT: Lend Lease Communities Pty Ltd	DATE: Sep-17

Grant Russell

From: Srinivas, Nirmal <Nirmal.Srinivas@lendlease.com>
Sent: Thursday, 21 September 2017 1:23 PM
To: Grant Russell
Subject: RE: [EXT]:RE: Jordan Springs -

Grant,

Burton for Lendlease.

Thanks,

Nirmal Srinivas
Assistant Development Manager, Communities
Level 2, 88 Phillip Street, Parramatta NSW 2150 Australia
T +61 2 9277 2688 M 0438 488 037
nirmal.srinivas@lendlease.com | www.lendlease.com

From: Grant Russell [mailto:Grant.Russell@douglaspartners.com.au]
Sent: Thursday, 21 September 2017 1:21 PM
To: Srinivas, Nirmal <Nirmal.Srinivas@lendlease.com>
Subject: RE: [EXT]:RE: Jordan Springs -

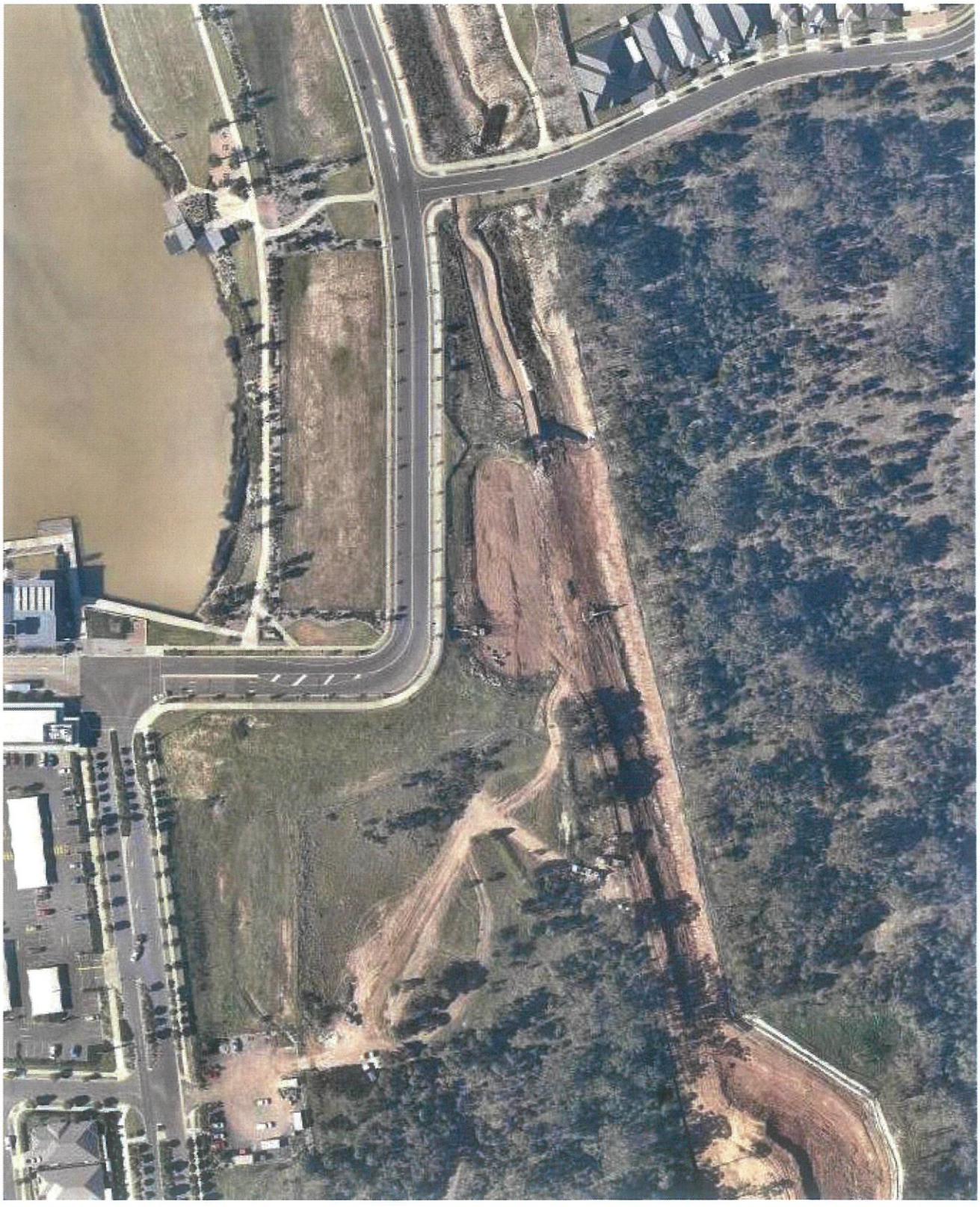
Nirmal,
Was the work undertaken by Burton for lend lease or previous owners CID?
Regards
Grant

Grant Russell | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
18 Waler Crescent Smeaton Grange NSW 2567
P: 02 4647 0075 | F: 02 4646 1886 | E: Grant.Russell@douglaspartners.com.au

From: Srinivas, Nirmal [mailto:Nirmal.Srinivas@lendlease.com]
Sent: Thursday, 21 September 2017 1:12 PM
To: Grant Russell
Cc: Chris Kline
Subject: RE: [EXT]:RE: Jordan Springs -

Hi Grant,

The basin was filled up using cut and fill material on site and the works were carried out by Burton Contractor. Basically when new channel was built, soil from there was used for filling up the basin – see image below.



Thanks,

Nirmal Srinivas
Assistant Development Manager, Communities
Level 2, 88 Phillip Street, Parramatta NSW 2150 Australia
T +61 2 9277 2688 M 0438 488 037
nirmal.srinivas@lendlease.com | www.lendlease.com

From: Grant Russell [mailto:Grant.Russell@douglaspartners.com.au]
Sent: Thursday, 21 September 2017 10:58 AM
To: Srinivas, Nirmal <Nirmal.Srinivas@lendlease.com>
Cc: Chris Kline <Chris.Kline@douglaspartners.com.au>
Subject: [EXT]:RE: Jordan Springs -

Hi Nirmal,
Yes that is dam Im talking about that has recently been filled. We neec to find out who filled the dam and with what materials?
Regards
Grant

Grant Russell | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
18 Waler Crescent Smeaton Grange NSW 2567
P: 02 4647 0075 | F: 02 4646 1886 | E: Grant.Russell@douglaspartners.com.au

From: Srinivas, Nirmal [mailto:Nirmal.Srinivas@lendlease.com]
Sent: Thursday, 21 September 2017 10:54 AM

To: Grant R.ıssell
Subject: RE: Jordan Springs -

Hi Grant,

Are you talk ng about this portion cf land – see image below?

Nirmal Srinivas
Assistant Development Manager, Communities
Level 2, 88 Phillip Street, Parramatta NSW 2150 Australia
T +61 2 9277 2688 M 0438 488 037
nirmal.srinivas@lendlease.com | www.lendlease.com

From: Srinivas, Nirmal
Sent: Tuesday, 19 September 2017 3:58 PM
To: 'grant.russell@douglaspartners.com.au' <grant.russell@douglaspartners.com.au>
Cc: Chris Kline <Chris.Kline@douglaspartners.com.au>
Subject: Jordan Springs - Site Audit Statements/CMP

Hi Grant,

As requested please see attached information relating to contamination.

Thanks,

Nirmal Srinivas
Assistant Development Manager, Communities
Level 2, 88 Phillip Street, Parramatta NSW 2150 Australia
T +61 2 9277 2688 M 0438 488 037
nirmal.srinivas@lendlease.com | www.lendlease.com

Disclaimer

"Arial","sans-serif";color:#7F7F7F;mso-themecolor:text1;mso-themetint:128; mso-style-textfill-fill-color:#7F7F7F;mso-style-textfill-fill-themecolor:text1; mso-style-textfill-fill-alpha:100.0%;mso-style-textfill-fill-colortransforms: "lumm=50000 lumo=50000"">

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"Arial","sans-serif";color:#7F7F7F;mso-themecolor:text1;mso-themetint:128; mso-style-textfill-fill-color:#7F7F7F;mso-style-textfill-fill-themecolor:text1; mso-style-textfill-fill-alpha:100.0%;mso-style-textfill-fill-colortransforms: "lumm=50000 lumo=50000""> This email and any attachments are confidential and may also contain copyright material of the Lendlease Group. If you are not the intended recipient, please notify us immediately and delete all copies of this message. You must not copy, use, disclose, distribute or rely on the information contained in it. Copying or use of this communication or information in it is strictly prohibited and may be unlawful. Contracts cannot be concluded with the Lendlease Group nor service effected by email. None of the staff of the Lendlease Group are authorised to enter into contracts on behalf of any member of the Lendlease Group in this manner. The fact that this communication is in electronic form does not constitute our consent to conduct transactions by electronic means or to use or accept electronic records or electronic signatures. Confidentiality and legal privilege attached to this communication are not waived or lost by reason of mistaken delivery to you. Lendlease does not guarantee that this email or the attachment(s) are unaffected by computer virus, corruption or other defects and accepts no liability for any damage caused by this email or its attachments due to viruses, interception, corruption or unauthorised access. Lendlease Group may monitor email traffic data and also the content of email for the purposes of security and staff training. Please note that our servers may not be located in your country. A list of Lendlease Group entities can be found here.

APPENDIX C

NSW EPA

Search results

Your search for:Suburb: JORDAN SPRINGS

Search Again
Refine Search

did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

6 April 2018

For business and industry ()

For local government ()

Contact us

131 555 (tel:131555)

Online (http://www.epa.nsw.gov.au/about-us/contact-us/feedback/feedback-form)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (http://www.epa.nsw.gov.au/about-us/contact-us/locations)

Find us on (https://www.linkedin.com/company/epansw)

Search results

Your search for: **General Search** with the following criteria

Suburb - JORDAN SPRINGS

returned 2 results

Export to excel 1 of 1 Pages Search Again

Number	Name	Location	Type	Status	Issued date
20310	Maryland Development Company Pty Ltd	Corner of Lakeside Parade and Jubilee Drive, JORDAN SPRINGS, NSW 2747	POEO licence	Surrendered	05 Sep 2013
1526557	Maryland Development Company Pty Ltd	Corner of Lakeside Parade and Jubilee Drive, JORDAN SPRINGS, NSW 2747	s.58 Licence Variation	Issued	06 Jan 2015

06 April 2018

APPENDIX D

GROUNDWATER

Department of Primary Industries
Office of Water

Home | About us | Water Management | Water Licensing | Urban Water

Real-time data

home · help · login · contact · customise

All Groundwater

find a site

- All Groundwater Map
  - North Coast Region
  - Hunter Region
  - Greater Sydney Region
    - **Hawkesbury Riv...**
    - Georges River Basin
    - Wollongong Basin
  - South Coast Region
  - Northwest Region
  - Central West Region
  - Southwest Region
  - Far West Region
  - Great Artesian Basin
  - Coal Basins

bandwidth (•) high ( ) low

glossary and metadata

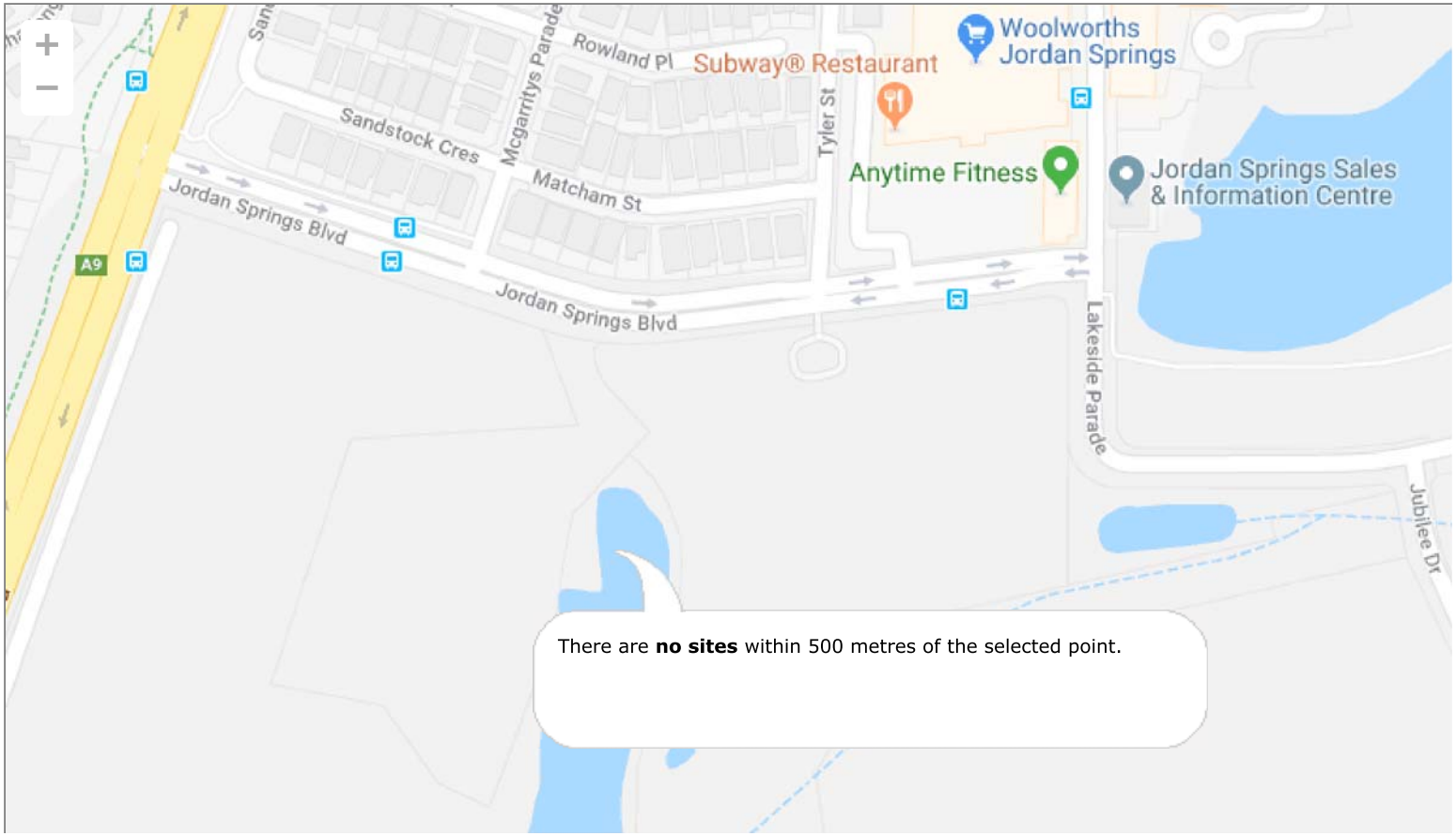
All Groundwater » All Groundwater Map » Greater Sydney Region

Hawkesbury River Basin

bookmark this page

All data times are Eastern Standard Time

Map



APPENDIX E

LABORATORY

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Craig Cowper	Manager	Huong Crawford
Client	ALLIANCE GEOTECHNICAL PTY LTD	Laboratory	SGS Alexandria Environmental
Address	10 Welder Road Seven Hills NSW 2147	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	0407 989 885	Telephone	+61 2 8594 0400
Facsimile	02 9675 1888	Facsimile	+61 2 8594 0499
Email	c.cowper@allgeo.com.au	Email	au.environmental.sydney@sgs.com
Project	**7161 Jordan Springs**	SGS Reference	**SE177801 R1**
Order Number	**P1054**	Date Received	10 Apr 2018
Samples	17	Date Reported	17 Apr 2018

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

This report cancels and supersedes the report No.SE177801 R0 dated 13th April 2018 issued by SGS Environment, Health and Safety due to addition of PAH results #5.

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemis

Kamrul Ahsan
Senior Chemist

Parameter	Units	LOR	Sample Number: SE177801.001 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: SP01/01	SE177801.002 Soil 09 Apr 2018 SP01/02	SE177801.003 Soil 09 Apr 2018 SP01/03	SE177801.004 Soil 09 Apr 2018 SP02/01
VOC's in Soil Method: AN433 Tested: 12/4/2018						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	**0.4**	<0.1	<0.1	**0.4**
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**89**	**81**	**73**	**86**
d4-1,2-dichloroethane (Surrogate)	%	-	**110**	**108**	**118**	**115**
d8-toluene (Surrogate)	%	-	**126**	**118**	**114**	**109**
Bromofluorobenzene (Surrogate)	%	-	**76**	**82**	**82**	**72**
Totals						
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 12/4/2018						
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**89**	**81**	**73**	**86**
d4-1,2-dichloroethane (Surrogate)	%	-	**110**	**108**	**118**	**115**
d8-toluene (Surrogate)	%	-	**126**	**118**	**114**	**109**
Bromofluorobenzene (Surrogate)	%	-	**76**	**82**	**82**	**72**
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE177801.001 Soil 09 Apr 2018 SP01/01	SE177801.002 Soil 09 Apr 2018 SP01/02	SE177801.003 Soil 09 Apr 2018 SP01/03	SE177801.004 Soil 09 Apr 2018 SP02/01
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 12/4/2018							
TRH C10-C14	mg/kg	20		<20	<20	<20	<20
TRH C15-C28	mg/kg	45		<45	<45	<45	<45
TRH C29-C36	mg/kg	45		<45	<45	<45	<45
TRH C37-C40	mg/kg	100		<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110		<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210		<210	<210	<210	<210
TRH F Bands							
TRH >C10-C16	mg/kg	25		<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25		<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90		<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120		<120	<120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 12/4/2018							
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2		<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3		<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2		<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8		<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8		<0.8	<0.8	<0.8	<0.8
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		**78**	**74**	**74**	**72**
2-fluorobiphenyl (Surrogate)	%	-		**96**	**104**	**102**	**104**
d14-p-terphenyl (Surrogate)	%	-		**108**	**114**	**114**	**114**
OC Pesticides in Soil Method: AN420 Tested: 12/4/2018							
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2		<0.2	<0.2	<0.2	<0.2

Parameter	Units	LOR	Sample Number: SE177801.001 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: SP01/01	SE177801.002 Soil 09 Apr 2018 SP01/02	SE177801.003 Soil 09 Apr 2018 SP01/03	SE177801.004 Soil 09 Apr 2018 SP02/01
OC Pesticides in Soil Method: AN420 Tested: 12/4/2018 (continued)						
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**105**	**105**	**89**	**98**
PCBs in Soil Method: AN420 Tested: 12/4/2018						
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**105**	**105**	**89**	**98**
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 12/4/2018						
Arsenic, As	mg/kg	3	**6**	**7**	**5**	**7**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	**11**	**21**	**13**	**15**
Copper, Cu	mg/kg	0.5	**14**	**20**	**24**	**43**
Nickel, Ni	mg/kg	0.5	**2.4**	**6.9**	**7.6**	**13**
Lead, Pb	mg/kg	1	**14**	**19**	**14**	**45**
Zinc, Zn	mg/kg	0.5	**14**	**42**	**31**	**140**
Mercury in Soil Method: AN312 Tested: 12/4/2018						
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE177801.001 Soil 09 Apr 2018 SP01/01	SE177801.002 Soil 09 Apr 2018 SP01/02	SE177801.003 Soil 09 Apr 2018 SP01/03	SE177801.004 Soil 09 Apr 2018 SP02/01
Moisture Content Method: AN002 Tested: 12/4/2018							
% Moisture	%w/w	0.5		**10**	**5.9**	**9.2**	**10**

Parameter	Units	LOR	Sample Number: SE177801.005 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: SP02/02	SE177801.006 Material 09 Apr 2018 SP02/02-FRAG	SE177801.007 Soil 09 Apr 2018 SP02/03	SE177801.008 Material 09 Apr 2018 SP03/FCS
VOC's in Soil Method: AN433 Tested: 12/4/2018						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	-	<0.1	-
Toluene	mg/kg	0.1	<0.1	-	<0.1	-
Ethylbenzene	mg/kg	0.1	<0.1	-	<0.1	-
m/p-xylene	mg/kg	0.2	<0.2	-	<0.2	-
o-xylene	mg/kg	0.1	<0.1	-	<0.1	-
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	**0.3**	-	<0.1	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**83**	-	**72**	-
d4-1,2-dichloroethane (Surrogate)	%	-	**103**	-	**103**	-
d8-toluene (Surrogate)	%	-	**115**	-	**116**	-
Bromofluorobenzene (Surrogate)	%	-	**73**	-	**79**	-
Totals						
Total Xylenes	mg/kg	0.3	<0.3	-	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	-	<0.6	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 12/4/2018						
TRH C6-C10	mg/kg	25	<25	-	<25	-
TRH C6-C9	mg/kg	20	<20	-	<20	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**83**	-	**72**	-
d4-1,2-dichloroethane (Surrogate)	%	-	**103**	-	**103**	-
d8-toluene (Surrogate)	%	-	**115**	-	**116**	-
Bromofluorobenzene (Surrogate)	%	-	**73**	-	**79**	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	-	<0.1	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-	<25	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE177801.005 Soil 09 Apr 2018 SP02/02	SE177801.006 Material 09 Apr 2018 SP02/02-FRAG	SE177801.007 Soil 09 Apr 2018 SP02/03	SE177801.008 Material 09 Apr 2018 SP03/FCS
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 12/4/2018						
TRH C10-C14	mg/kg	20	<20	-	<20	-
TRH C15-C28	mg/kg	45	<45	-	<45	-
TRH C29-C36	mg/kg	45	<45	-	<45	-
TRH C37-C40	mg/kg	100	<100	-	<100	-
TRH C10-C36 Total	mg/kg	110	<110	-	<110	-
TRH C10-C40 Total (F bands)	mg/kg	210	<210	-	<210	-
TRH F Bands						
TRH >C10-C16	mg/kg	25	<25	-	<25	-
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	<25	-
TRH >C16-C34 (F3)	mg/kg	90	<90	-	<90	-
TRH >C34-C40 (F4)	mg/kg	120	<120	-	<120	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 12/4/2018						
Naphthalene	mg/kg	0.1	<0.1	-	<0.1	-
2-methylnaphthalene	mg/kg	0.1	<0.1	-	<0.1	-
1-methylnaphthalene	mg/kg	0.1	<0.1	-	<0.1	-
Acenaphthylene	mg/kg	0.1	<0.1	-	<0.1	-
Acenaphthene	mg/kg	0.1	<0.1	-	<0.1	-
Fluorene	mg/kg	0.1	<0.1	-	<0.1	-
Phenanthrene	mg/kg	0.1	**0.3**	-	<0.1	-
Anthracene	mg/kg	0.1	<0.1	-	<0.1	-
Fluoranthene	mg/kg	0.1	**0.3**	-	<0.1	-
Pyrene	mg/kg	0.1	**0.5**	-	<0.1	-
Benzo(a)anthracene	mg/kg	0.1	**0.2**	-	<0.1	-
Chrysene	mg/kg	0.1	**0.2**	-	<0.1	-
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.1**	-	<0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(a)pyrene	mg/kg	0.1	**0.1**	-	<0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	<0.1	-
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(ghi)perylene	mg/kg	0.1	**0.1**	-	<0.1	-
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	-	<0.2	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	<0.3	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.2**	-	<0.2	-
Total PAH (18)	mg/kg	0.8	**1.9**	-	<0.8	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**1.9**	-	<0.8	-
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	**78**	-	**76**	-
2-fluorobiphenyl (Surrogate)	%	-	**106**	-	**86**	-
d14-p-terphenyl (Surrogate)	%	-	**114**	-	**98**	-
OC Pesticides in Soil Method: AN420 Tested: 12/4/2018						
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	-	<0.1	-
Alpha BHC	mg/kg	0.1	<0.1	-	<0.1	-
Lindane	mg/kg	0.1	<0.1	-	<0.1	-
Heptachlor	mg/kg	0.1	<0.1	-	<0.1	-
Aldrin	mg/kg	0.1	<0.1	-	<0.1	-
Beta BHC	mg/kg	0.1	<0.1	-	<0.1	-
Delta BHC	mg/kg	0.1	<0.1	-	<0.1	-
Heptachlor epoxide	mg/kg	0.1	<0.1	-	<0.1	-
o,p'-DDE	mg/kg	0.1	<0.1	-	<0.1	-
Alpha Endosulfan	mg/kg	0.2	<0.2	-	<0.2	-
Gamma Chlordane	mg/kg	0.1	<0.1	-	<0.1	-
Alpha Chlordane	mg/kg	0.1	<0.1	-	<0.1	-
trans-Nonachlor	mg/kg	0.1	<0.1	-	<0.1	-
p,p'-DDE	mg/kg	0.1	<0.1	-	<0.1	-
Dieldrin	mg/kg	0.2	<0.2	-	<0.2	-
Endrin	mg/kg	0.2	<0.2	-	<0.2	-

Parameter	Units	LOR	Sample Number: SE177801.005 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: SP02/02	SE177801.006 Material 09 Apr 2018 SP02/02-FRAG	SE177801.007 Soil 09 Apr 2018 SP02/03	SE177801.008 Material 09 Apr 2018 SP03/FCS
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018 (continued)						
o,p'-DDD	mg/kg	0.1	<0.1	-	<0.1	-
o,p'-DDT	mg/kg	0.1	<0.1	-	<0.1	-
Beta Endosulfan	mg/kg	0.2	<0.2	-	<0.2	-
p,p'-DDD	mg/kg	0.1	<0.1	-	<0.1	-
p,p'-DDT	mg/kg	0.1	<0.1	-	<0.1	-
Endosulfan sulphate	mg/kg	0.1	<0.1	-	<0.1	-
Endrin Aldehyde	mg/kg	0.1	<0.1	-	<0.1	-
Methoxychlor	mg/kg	0.1	<0.1	-	<0.1	-
Endrin Ketone	mg/kg	0.1	<0.1	-	<0.1	-
Isodrin	mg/kg	0.1	<0.1	-	<0.1	-
Mirex	mg/kg	0.1	<0.1	-	<0.1	-
Total CLP OC Pesticides	mg/kg	1	<1	-	<1	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**104**	-	**70**	-
PCBs in Soil Method: AN420 Tested: 12/4/2018						
Arochlor 1016	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1221	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1232	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1242	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1248	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1254	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1260	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1262	mg/kg	0.2	<0.2	-	<0.2	-
Arochlor 1268	mg/kg	0.2	<0.2	-	<0.2	-
Total PCBs (Arochlors)	mg/kg	1	<1	-	<1	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**104**	-	**70**	-
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 12/4/2018						
Arsenic, As	mg/kg	3	**7**	-	**5**	-
Cadmium, Cd	mg/kg	0.3	<0.3	-	<0.3	-
Chromium, Cr	mg/kg	0.3	**15**	-	**13**	-
Copper, Cu	mg/kg	0.5	**55**	-	**34**	-
Nickel, Ni	mg/kg	0.5	**12**	-	**11**	-
Lead, Pb	mg/kg	1	**68**	-	**40**	-
Zinc, Zn	mg/kg	0.5	**180**	-	**190**	-
Mercury in Soil Method: AN312 Tested: 12/4/2018						
Mercury	mg/kg	0.05	**0.05**	-	<0.05	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE177801.005 Soil 09 Apr 2018 SP02/02	SE177801.006 Material 09 Apr 2018 SP02/02-FRAG	SE177801.007 Soil 09 Apr 2018 SP02/03	SE177801.008 Material 09 Apr 2018 SP03/FCS
Moisture Content Method: AN002 Tested: 12/4/2018							
% Moisture	%w/w	0.5		**9.6**	-	**8.3**	-

Parameter	Units	LOR	Sample Number: SE177801.009 Sample Matrix: Material Sample Date: 09 Apr 2018 Sample Name: SP04/FCS	SE177801.010 Material 09 Apr 2018 SP05/FCS	SE177801.011 Material 09 Apr 2018 SP06/FCS	SE177801.012 Material 09 Apr 2018 SP07/FCS
VOC's in Soil Method: AN433 Tested: 13/4/2018						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	-	-	-	-
Toluene	mg/kg	0.1	-	-	-	-
Ethylbenzene	mg/kg	0.1	-	-	-	-
m/p-xylene	mg/kg	0.2	-	-	-	-
o-xylene	mg/kg	0.1	-	-	-	-
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
Totals						
Total Xylenes	mg/kg	0.3	-	-	-	-
Total BTEX	mg/kg	0.6	-	-	-	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 13/4/2018						
TRH C6-C10	mg/kg	25	-	-	-	-
TRH C6-C9	mg/kg	20	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	-	-	-	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE177801.009 Material 09 Apr 2018 SP04/FCS	SE177801.010 Material 09 Apr 2018 SP05/FCS	SE177801.011 Material 09 Apr 2018 SP06/FCS	SE177801.012 Material 09 Apr 2018 SP07/FCS
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 13/4/2018							
TRH C10-C14	mg/kg	20		-	-	-	-
TRH C15-C28	mg/kg	45		-	-	-	-
TRH C29-C36	mg/kg	45		-	-	-	-
TRH C37-C40	mg/kg	100		-	-	-	-
TRH C10-C36 Total	mg/kg	110		-	-	-	-
TRH C10-C40 Total (F bands)	mg/kg	210		-	-	-	-
TRH F Bands							
TRH >C10-C16	mg/kg	25		-	-	-	-
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25		-	-	-	-
TRH >C16-C34 (F3)	mg/kg	90		-	-	-	-
TRH >C34-C40 (F4)	mg/kg	120		-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2018							
Naphthalene	mg/kg	0.1		-	-	-	-
2-methylnaphthalene	mg/kg	0.1		-	-	-	-
1-methylnaphthalene	mg/kg	0.1		-	-	-	-
Acenaphthylene	mg/kg	0.1		-	-	-	-
Acenaphthene	mg/kg	0.1		-	-	-	-
Fluorene	mg/kg	0.1		-	-	-	-
Phenanthrene	mg/kg	0.1		-	-	-	-
Anthracene	mg/kg	0.1		-	-	-	-
Fluoranthene	mg/kg	0.1		-	-	-	-
Pyrene	mg/kg	0.1		-	-	-	-
Benzo(a)anthracene	mg/kg	0.1		-	-	-	-
Chrysene	mg/kg	0.1		-	-	-	-
Benzo(b&j)fluoranthene	mg/kg	0.1		-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1		-	-	-	-
Benzo(a)pyrene	mg/kg	0.1		-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		-	-	-	-
Dibenzo(ah)anthracene	mg/kg	0.1		-	-	-	-
Benzo(ghi)perylene	mg/kg	0.1		-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2		-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3		-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2		-	-	-	-
Total PAH (18)	mg/kg	0.8		-	-	-	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8		-	-	-	-
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018							
Hexachlorobenzene (HCB)	mg/kg	0.1		-	-	-	-
Alpha BHC	mg/kg	0.1		-	-	-	-
Lindane	mg/kg	0.1		-	-	-	-
Heptachlor	mg/kg	0.1		-	-	-	-
Aldrin	mg/kg	0.1		-	-	-	-
Beta BHC	mg/kg	0.1		-	-	-	-
Delta BHC	mg/kg	0.1		-	-	-	-
Heptachlor epoxide	mg/kg	0.1		-	-	-	-
o,p'-DDE	mg/kg	0.1		-	-	-	-
Alpha Endosulfan	mg/kg	0.2		-	-	-	-
Gamma Chlordane	mg/kg	0.1		-	-	-	-
Alpha Chlordane	mg/kg	0.1		-	-	-	-
trans-Nonachlor	mg/kg	0.1		-	-	-	-
p,p'-DDE	mg/kg	0.1		-	-	-	-
Dieldrin	mg/kg	0.2		-	-	-	-
Endrin	mg/kg	0.2		-	-	-	-

Parameter	Units	LOR	Sample Number: SE177801.009 Sample Matrix: Material Sample Date: 09 Apr 2018 Sample Name: SP04/FCS	SE177801.010 Material 09 Apr 2018 SP05/FCS	SE177801.011 Material 09 Apr 2018 SP06/FCS	SE177801.012 Material 09 Apr 2018 SP07/FCS
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018 (continued)						
o,p'-DDD	mg/kg	0.1	-	-	-	-
o,p'-DDT	mg/kg	0.1	-	-	-	-
Beta Endosulfan	mg/kg	0.2	-	-	-	-
p,p'-DDD	mg/kg	0.1	-	-	-	-
p,p'-DDT	mg/kg	0.1	-	-	-	-
Endosulfan sulphate	mg/kg	0.1	-	-	-	-
Endrin Aldehyde	mg/kg	0.1	-	-	-	-
Methoxychlor	mg/kg	0.1	-	-	-	-
Endrin Ketone	mg/kg	0.1	-	-	-	-
Isodrin	mg/kg	0.1	-	-	-	-
Mirex	mg/kg	0.1	-	-	-	-
Total CLP OC Pesticides	mg/kg	1	-	-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-	-	-
PCBs in Soil Method: AN420 Tested: 13/4/2018						
Arochlor 1016	mg/kg	0.2	-	-	-	-
Arochlor 1221	mg/kg	0.2	-	-	-	-
Arochlor 1232	mg/kg	0.2	-	-	-	-
Arochlor 1242	mg/kg	0.2	-	-	-	-
Arochlor 1248	mg/kg	0.2	-	-	-	-
Arochlor 1254	mg/kg	0.2	-	-	-	-
Arochlor 1260	mg/kg	0.2	-	-	-	-
Arochlor 1262	mg/kg	0.2	-	-	-	-
Arochlor 1268	mg/kg	0.2	-	-	-	-
Total PCBs (Arochlors)	mg/kg	1	-	-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-	-	-
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 13/4/2018						
Arsenic, As	mg/kg	3	-	-	-	-
Cadmium, Cd	mg/kg	0.3	-	-	-	-
Chromium, Cr	mg/kg	0.3	-	-	-	-
Copper, Cu	mg/kg	0.5	-	-	-	-
Nickel, Ni	mg/kg	0.5	-	-	-	-
Lead, Pb	mg/kg	1	-	-	-	-
Zinc, Zn	mg/kg	0.5	-	-	-	-
Mercury in Soil Method: AN312 Tested: 12/4/2018						
Mercury	mg/kg	0.05	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE177801.009 Material 09 Apr 2018 SP04/FCS	SE177801.010 Material 09 Apr 2018 SP05/FCS	SE177801.011 Material 09 Apr 2018 SP06/FCS	SE177801.012 Material 09 Apr 2018 SP07/FCS
Moisture Content Method: AN002 Tested: 12/4/2018							
% Moisture	%w/w	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE177801.013 Material 09 Apr 2018 SP08/FCS	SE177801.014 Material 09 Apr 2018 SP09/FCS	SE177801.015 Material 09 Apr 2018 SP10/FCS	SE177801.016 Material 09 Apr 2018 SP11/FCS
VOC's in Soil Method: AN433 Tested: 13/4/2018						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	-	-	-	-
Toluene	mg/kg	0.1	-	-	-	-
Ethylbenzene	mg/kg	0.1	-	-	-	-
m/p-xylene	mg/kg	0.2	-	-	-	-
o-xylene	mg/kg	0.1	-	-	-	-
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
Totals						
Total Xylenes	mg/kg	0.3	-	-	-	-
Total BTEX	mg/kg	0.6	-	-	-	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 13/4/2018						
TRH C6-C10	mg/kg	25	-	-	-	-
TRH C6-C9	mg/kg	20	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	-	-	-	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE177801.013 Material 09 Apr 2018 SP08/FCS	SE177801.014 Material 09 Apr 2018 SP09/FCS	SE177801.015 Material 09 Apr 2018 SP10/FCS	SE177801.016 Material 09 Apr 2018 SP11/FCS
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 13/4/2018						
TRH C10-C14	mg/kg	20	-	-	-	-
TRH C15-C28	mg/kg	45	-	-	-	-
TRH C29-C36	mg/kg	45	-	-	-	-
TRH C37-C40	mg/kg	100	-	-	-	-
TRH C10-C36 Total	mg/kg	110	-	-	-	-
TRH C10-C40 Total (F bands)	mg/kg	210	-	-	-	-
TRH F Bands						
TRH >C10-C16	mg/kg	25	-	-	-	-
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	-	-	-	-
TRH >C16-C34 (F3)	mg/kg	90	-	-	-	-
TRH >C34-C40 (F4)	mg/kg	120	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2018						
Naphthalene	mg/kg	0.1	-	-	-	-
2-methylnaphthalene	mg/kg	0.1	-	-	-	-
1-methylnaphthalene	mg/kg	0.1	-	-	-	-
Acenaphthylene	mg/kg	0.1	-	-	-	-
Acenaphthene	mg/kg	0.1	-	-	-	-
Fluorene	mg/kg	0.1	-	-	-	-
Phenanthrene	mg/kg	0.1	-	-	-	-
Anthracene	mg/kg	0.1	-	-	-	-
Fluoranthene	mg/kg	0.1	-	-	-	-
Pyrene	mg/kg	0.1	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	-	-	-	-
Chrysene	mg/kg	0.1	-	-	-	-
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	-	-
Dibenzo(ah)anthracene	mg/kg	0.1	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.1	-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	-	-	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	-	-	-	-
Total PAH (18)	mg/kg	0.8	-	-	-	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8	-	-	-	-
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-	-	-	-	-
d14-p-terphenyl (Surrogate)	%	-	-	-	-	-
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018						
Hexachlorobenzene (HCB)	mg/kg	0.1	-	-	-	-
Alpha BHC	mg/kg	0.1	-	-	-	-
Lindane	mg/kg	0.1	-	-	-	-
Heptachlor	mg/kg	0.1	-	-	-	-
Aldrin	mg/kg	0.1	-	-	-	-
Beta BHC	mg/kg	0.1	-	-	-	-
Delta BHC	mg/kg	0.1	-	-	-	-
Heptachlor epoxide	mg/kg	0.1	-	-	-	-
o,p'-DDE	mg/kg	0.1	-	-	-	-
Alpha Endosulfan	mg/kg	0.2	-	-	-	-
Gamma Chlordane	mg/kg	0.1	-	-	-	-
Alpha Chlordane	mg/kg	0.1	-	-	-	-
trans-Nonachlor	mg/kg	0.1	-	-	-	-
p,p'-DDE	mg/kg	0.1	-	-	-	-
Dieldrin	mg/kg	0.2	-	-	-	-
Endrin	mg/kg	0.2	-	-	-	-

Parameter	Units	LOR	Sample Number: SE177801.013 Sample Matrix: Material Sample Date: 09 Apr 2018 Sample Name: SP08/FCS	SE177801.014 Material 09 Apr 2018 SP09/FCS	SE177801.015 Material 09 Apr 2018 SP10/FCS	SE177801.016 Material 09 Apr 2018 SP11/FCS
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018 (continued)						
o,p'-DDD	mg/kg	0.1	-	-	-	-
o,p'-DDT	mg/kg	0.1	-	-	-	-
Beta Endosulfan	mg/kg	0.2	-	-	-	-
p,p'-DDD	mg/kg	0.1	-	-	-	-
p,p'-DDT	mg/kg	0.1	-	-	-	-
Endosulfan sulphate	mg/kg	0.1	-	-	-	-
Endrin Aldehyde	mg/kg	0.1	-	-	-	-
Methoxychlor	mg/kg	0.1	-	-	-	-
Endrin Ketone	mg/kg	0.1	-	-	-	-
Isodrin	mg/kg	0.1	-	-	-	-
Mirex	mg/kg	0.1	-	-	-	-
Total CLP OC Pesticides	mg/kg	1	-	-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-	-	-
PCBs in Soil Method: AN420 Tested: 13/4/2018						
Arochlor 1016	mg/kg	0.2	-	-	-	-
Arochlor 1221	mg/kg	0.2	-	-	-	-
Arochlor 1232	mg/kg	0.2	-	-	-	-
Arochlor 1242	mg/kg	0.2	-	-	-	-
Arochlor 1248	mg/kg	0.2	-	-	-	-
Arochlor 1254	mg/kg	0.2	-	-	-	-
Arochlor 1260	mg/kg	0.2	-	-	-	-
Arochlor 1262	mg/kg	0.2	-	-	-	-
Arochlor 1268	mg/kg	0.2	-	-	-	-
Total PCBs (Arochlors)	mg/kg	1	-	-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-	-	-
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 13/4/2018						
Arsenic, As	mg/kg	3	-	-	-	-
Cadmium, Cd	mg/kg	0.3	-	-	-	-
Chromium, Cr	mg/kg	0.3	-	-	-	-
Copper, Cu	mg/kg	0.5	-	-	-	-
Nickel, Ni	mg/kg	0.5	-	-	-	-
Lead, Pb	mg/kg	1	-	-	-	-
Zinc, Zn	mg/kg	0.5	-	-	-	-
Mercury in Soil Method: AN312 Tested: 12/4/2018						
Mercury	mg/kg	0.05	-	-	-	-

Parameter	Units	LOR	Sample Number: SE177801.013 Sample Matrix: Material Sample Date: 09 Apr 2018 Sample Name: SP08/FCS	SE177801.014 Material 09 Apr 2018 SP09/FCS	SE177801.015 Material 09 Apr 2018 SP10/FCS	SE177801.016 Material 09 Apr 2018 SP11/FCS
Moisture Content Method: AN002 Tested: 12/4/2018						
% Moisture	%w/w	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number: SE177801.017 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: DUP01
VOC's in Soil Method: AN433 Tested: 13/4/2018			
Monocyclic Aromatic Hydrocarbons			
Benzene	mg/kg	0.1	-
Toluene	mg/kg	0.1	-
Ethylbenzene	mg/kg	0.1	-
m/p-xylene	mg/kg	0.2	-
o-xylene	mg/kg	0.1	-
Polycyclic VOCs			
Naphthalene	mg/kg	0.1	-
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-
d8-toluene (Surrogate)	%	-	-
Bromofluorobenzene (Surrogate)	%	-	-
Totals			
Total Xylenes	mg/kg	0.3	-
Total BTEX	mg/kg	0.6	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 13/4/2018			
TRH C6-C10	mg/kg	25	-
TRH C6-C9	mg/kg	20	-
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-
d8-toluene (Surrogate)	%	-	-
Bromofluorobenzene (Surrogate)	%	-	-

Parameter	Units	LOR	Sample Number: SE177801.017 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: DUP01
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 13/4/2018 (continued)			
VPH F Bands			
Benzene (F0)	mg/kg	0.1	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 13/4/2018			
TRH C10-C14	mg/kg	20	-
TRH C15-C28	mg/kg	45	-
TRH C29-C36	mg/kg	45	-
TRH C37-C40	mg/kg	100	-
TRH C10-C36 Total	mg/kg	110	-
TRH C10-C40 Total (F bands)	mg/kg	210	-
TRH F Bands			
TRH >C10-C16	mg/kg	25	-
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	-
TRH >C16-C34 (F3)	mg/kg	90	-
TRH >C34-C40 (F4)	mg/kg	120	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2018			
Naphthalene	mg/kg	0.1	-
2-methylnaphthalene	mg/kg	0.1	-
1-methylnaphthalene	mg/kg	0.1	-
Acenaphthylene	mg/kg	0.1	-
Acenaphthene	mg/kg	0.1	-
Fluorene	mg/kg	0.1	-
Phenanthrene	mg/kg	0.1	-
Anthracene	mg/kg	0.1	-
Fluoranthene	mg/kg	0.1	-
Pyrene	mg/kg	0.1	-
Benzo(a)anthracene	mg/kg	0.1	-
Chrysene	mg/kg	0.1	-
Benzo(b&j)fluoranthene	mg/kg	0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	-
Benzo(a)pyrene	mg/kg	0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-
Dibenzo(ah)anthracene	mg/kg	0.1	-
Benzo(ghi)perylene	mg/kg	0.1	-
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	-
Total PAH (18)	mg/kg	0.8	-
Total PAH (NEPM/WHO 16)	mg/kg	0.8	-

Parameter	Units	LOR	Sample Number: SE177801.017 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: DUP01
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/4/2018 (continued)			
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	-
2-fluorobiphenyl (Surrogate)	%	-	-
d14-p-terphenyl (Surrogate)	%	-	-
OC Pesticides in Soil Method: AN420 Tested: 13/4/2018			
Hexachlorobenzene (HCB)	mg/kg	0.1	-
Alpha BHC	mg/kg	0.1	-
Lindane	mg/kg	0.1	-
Heptachlor	mg/kg	0.1	-
Aldrin	mg/kg	0.1	-
Beta BHC	mg/kg	0.1	-
Delta BHC	mg/kg	0.1	-
Heptachlor epoxide	mg/kg	0.1	-
o,p'-DDE	mg/kg	0.1	-
Alpha Endosulfan	mg/kg	0.2	-
Gamma Chlordane	mg/kg	0.1	-
Alpha Chlordane	mg/kg	0.1	-
trans-Nonachlor	mg/kg	0.1	-
p,p'-DDE	mg/kg	0.1	-
Dieldrin	mg/kg	0.2	-
Endrin	mg/kg	0.2	-
o,p'-DDD	mg/kg	0.1	-
o,p'-DDT	mg/kg	0.1	-
Beta Endosulfan	mg/kg	0.2	-
p,p'-DDD	mg/kg	0.1	-
p,p'-DDT	mg/kg	0.1	-
Endosulfan sulphate	mg/kg	0.1	-
Endrin Aldehyde	mg/kg	0.1	-
Methoxychlor	mg/kg	0.1	-
Endrin Ketone	mg/kg	0.1	-
Isodrin	mg/kg	0.1	-
Mirex	mg/kg	0.1	-
Total CLP OC Pesticides	mg/kg	1	-
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-

Parameter	Units	LOR	Sample Number: SE177801.017 Sample Matrix: Soil Sample Date: 09 Apr 2018 Sample Name: DUP01
PCBs in Soil Method: AN420 Tested: 13/4/2018			
Arochlor 1016	mg/kg	0.2	-
Arochlor 1221	mg/kg	0.2	-
Arochlor 1232	mg/kg	0.2	-
Arochlor 1242	mg/kg	0.2	-
Arochlor 1248	mg/kg	0.2	-
Arochlor 1254	mg/kg	0.2	-
Arochlor 1260	mg/kg	0.2	-
Arochlor 1262	mg/kg	0.2	-
Arochlor 1268	mg/kg	0.2	-
Total PCBs (Arochlors)	mg/kg	1	-
Surrogates			
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 12/4/2018			
Arsenic, As	mg/kg	3	**4**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	**13**
Copper, Cu	mg/kg	0.5	**22**
Nickel, Ni	mg/kg	0.5	**4.2**
Lead, Pb	mg/kg	1	**15**
Zinc, Zn	mg/kg	0.5	**28**
Mercury in Soil Method: AN312 Tested: 12/4/2018			
Mercury	mg/kg	0.05	<0.05

Parameter	Units	LOR	Sample Number SE177801.017 Sample Matrix Soil Sample Date 09 Apr 2018 Sample Name DUP01
Moisture Content Method: AN002 Tested: 12/4/2018			
% Moisture	%w/w	0.5	**8.8**

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil **Method: ME-(AU)-[ENV]AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB145441	mg/kg	0.05	<0.05	0%	106%	95%

Moisture Content **Method: ME-(AU)-[ENV]AN002**

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB145459	%w/w	0.5	0%

OC Pesticides in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Hexachlorobenzene (HCB)	LB145485	mg/kg	0.1	<0.1	0%	NA
Alpha BHC	LB145485	mg/kg	0.1	<0.1	0%	NA
Lindane	LB145485	mg/kg	0.1	<0.1	0%	NA
Heptachlor	LB145485	mg/kg	0.1	<0.1	0%	97%
Aldrin	LB145485	mg/kg	0.1	<0.1	0%	94%
Beta BHC	LB145485	mg/kg	0.1	<0.1	0%	NA
Delta BHC	LB145485	mg/kg	0.1	<0.1	0%	90%
Heptachlor epoxide	LB145485	mg/kg	0.1	<0.1	0%	NA
o,p'-DDE	LB145485	mg/kg	0.1	<0.1	0%	NA
Alpha Endosulfan	LB145485	mg/kg	0.2	<0.2	0%	NA
Gamma Chlordane	LB145485	mg/kg	0.1	<0.1	0%	NA
Alpha Chlordane	LB145485	mg/kg	0.1	<0.1	0%	NA
trans-Nonachlor	LB145485	mg/kg	0.1	<0.1	0%	NA
p,p'-DDE	LB145485	mg/kg	0.1	<0.1	0%	NA
Dieldrin	LB145485	mg/kg	0.2	<0.2	0%	93%
Endrin	LB145485	mg/kg	0.2	<0.2	0%	95%
o,p'-DDD	LB145485	mg/kg	0.1	<0.1	0%	NA
o,p'-DDT	LB145485	mg/kg	0.1	<0.1	0%	NA
Beta Endosulfan	LB145485	mg/kg	0.2	<0.2	0%	NA
p,p'-DDD	LB145485	mg/kg	0.1	<0.1	0%	NA
p,p'-DDT	LB145485	mg/kg	0.1	<0.1	0%	89%
Endosulfan sulphate	LB145485	mg/kg	0.1	<0.1	0%	NA
Endrin Aldehyde	LB145485	mg/kg	0.1	<0.1	0%	NA
Methoxychlor	LB145485	mg/kg	0.1	<0.1	0%	NA
Endrin Ketone	LB145485	mg/kg	0.1	<0.1	0%	NA
Isodrin	LB145485	mg/kg	0.1	<0.1	0%	NA
Mirex	LB145485	mg/kg	0.1	<0.1	0%	NA
Total CLP OC Pesticides	LB145485	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB145485	%	-	107%	14%	95%

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB145485	mg/kg	0.1	<0.1	0%	103%
2-methylnaphthalene	LB145485	mg/kg	0.1	<0.1	0%	NA
1-methylnaphthalene	LB145485	mg/kg	0.1	<0.1	0%	NA
Acenaphthylene	LB145485	mg/kg	0.1	<0.1	0%	96%
Acenaphthene	LB145485	mg/kg	0.1	<0.1	0%	107%
Fluorene	LB145485	mg/kg	0.1	<0.1	0%	NA
Phenanthrene	LB145485	mg/kg	0.1	<0.1	0%	104%
Anthracene	LB145485	mg/kg	0.1	<0.1	0%	101%
Fluoranthene	LB145485	mg/kg	0.1	<0.1	0%	104%
Pyrene	LB145485	mg/kg	0.1	<0.1	0%	101%
Benzo(a)anthracene	LB145485	mg/kg	0.1	<0.1	0%	NA
Chrysene	LB145485	mg/kg	0.1	<0.1	0%	NA
Benzo(b&j)fluoranthene	LB145485	mg/kg	0.1	<0.1	0%	NA
Benzo(k)fluoranthene	LB145485	mg/kg	0.1	<0.1	0%	NA
Benzo(a)pyrene	LB145485	mg/kg	0.1	<0.1	0%	112%
Indeno(1,2,3-cd)pyrene	LB145485	mg/kg	0.1	<0.1	0%	NA
Dibenzo(ah)anthracene	LB145485	mg/kg	0.1	<0.1	0%	NA
Benzo(ghi)perylene	LB145485	mg/kg	0.1	<0.1	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=0	LB145485	TEQ (mg/kg)	0.2	<0.2	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR	LB145485	TEQ (mg/kg)	0.3	<0.3	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	LB145485	TEQ (mg/kg)	0.2	<0.2	0%	NA
Total PAH (18)	LB145485	mg/kg	0.8	<0.8	0%	NA
Total PAH (NEPM/WHO 16)	LB145485	mg/kg	0.8	<0.8		

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB145485	%	-	86%	0%	96%
2-fluorobiphenyl (Surrogate)	LB145485	%	-	92%	4%	88%
d14-p-terphenyl (Surrogate)	LB145485	%	-	100%	0%	86%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PCBs in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arochlor 1016	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1221	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1232	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1242	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1248	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1254	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1260	LB145485	mg/kg	0.2	<0.2	0%	105%
Arochlor 1262	LB145485	mg/kg	0.2	<0.2	0%	NA
Arochlor 1268	LB145485	mg/kg	0.2	<0.2	0%	NA
Total PCBs (Arochlors)	LB145485	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB145485	%	-	97%	14%	92%

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB145473	mg/kg	3	<3	26 - 61%	111%	100%
Cadmium, Cd	LB145473	mg/kg	0.3	<0.3	0 - 18%	112%	111%
Chromium, Cr	LB145473	mg/kg	0.3	<0.3	1 - 14%	100%	101%
Copper, Cu	LB145473	mg/kg	0.5	<0.5	3 - 51%	111%	109%
Nickel, Ni	LB145473	mg/kg	0.5	<0.5	10 - 12%	106%	107%
Lead, Pb	LB145473	mg/kg	1	<1	5 - 13%	103%	5%
Zinc, Zn	LB145473	mg/kg	0.5	<0.5	8 - 23%	108%	34%

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB145485	mg/kg	20	<20	0%	88%	120%
TRH C15-C28	LB145485	mg/kg	45	<45	0%	100%	113%
TRH C29-C36	LB145485	mg/kg	45	<45	0%	75%	113%
TRH C37-C40	LB145485	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB145485	mg/kg	110	<110	0%	NA	NA
TRH C10-C40 Total (F bands)	LB145485	mg/kg	210	<210	0%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16	LB145485	mg/kg	25	<25	0%	75%	120%
TRH >C10-C16 - Naphthalene (F2)	LB145485	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB145485	mg/kg	90	<90	0%	78%	98%
TRH >C34-C40 (F4)	LB145485	mg/kg	120	<120	0%	90%	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOC's in Soil Method: ME-(AU)-[ENV]AN433

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Benzene	LB145431	mg/kg	0.1	<0.1	0%	96%
Toluene	LB145431	mg/kg	0.1	<0.1	0%	113%
Ethylbenzene	LB145431	mg/kg	0.1	<0.1	0%	113%
m/p-xylene	LB145431	mg/kg	0.2	<0.2	0%	122%
o-xylene	LB145431	mg/kg	0.1	<0.1	0%	112%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB145431	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB145431	%	-	104%	5 - 15%	85%
d4-1,2-dichloroethane (Surrogate)	LB145431	%	-	111%	14 - 15%	85%
d8-toluene (Surrogate)	LB145431	%	-	110%	1 - 7%	93%
Bromofluorobenzene (Surrogate)	LB145431	%	-	104%	3 - 6%	105%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Xylenes	LB145431	mg/kg	0.3	<0.3	0%	NA
Total BTEX	LB145431	mg/kg	0.6	<0.6	0%	NA

Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB145431	mg/kg	25	<25	0%	82%	87%
TRH C6-C9	LB145431	mg/kg	20	<20	0%	78%	80%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB145431	%	-	101%	5 - 15%	80%	85%
d4-1,2-dichloroethane (Surrogate)	LB145431	%	-	110%	14 - 15%	79%	85%
d8-toluene (Surrogate)	LB145431	%	-	109%	1 - 7%	80%	108%
Bromofluorobenzene (Surrogate)	LB145431	%	-	88%	3 - 6%	96%	80%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB145431	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB145431	mg/kg	25	<25	0%	92%	120%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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STATEMENT OF QA/QC PERFORMANCE

SE177801 R1

CLIENT DETAILS

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Client	ALLIANCE GEOTECHNICAL PTY LTD
Address	10 Welder Road Seven Hills NSW 2147
Telephone	0407 989 885
Facsimile	02 9675 1888
Email	c.cowper@allgeo.com.au
Project	**7161 Jordan Springs**
Order Number	**P1054**
Samples	17

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE177801 R1**
Date Received	10 Apr 2018
Date Reported	17 Apr 2018

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	2 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	8 Soil, 9 Material
Date documentation received	10/4/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.4°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

HOLDING TIME SUMMARY

SE177801 R1

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018
DUP01	SE177801.017	LB145441	09 Apr 2018	10 Apr 2018	07 May 2018	12 Apr 2018	07 May 2018	13 Apr 2018

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
SP01/02	SE177801.002	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
SP01/03	SE177801.003	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
SP02/01	SE177801.004	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
SP02/02	SE177801.005	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
SP02/03	SE177801.007	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018
DUP01	SE177801.017	LB145459	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	17 Apr 2018	13 Apr 2018

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	17 Apr 2018
SP02/03	SE177801.007	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
SP01/02	SE177801.002	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
SP01/03	SE177801.003	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
SP02/01	SE177801.004	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
SP02/02	SE177801.005	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
SP02/03	SE177801.007	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018
DUP01	SE177801.017	LB145473	09 Apr 2018	10 Apr 2018	06 Oct 2018	12 Apr 2018	06 Oct 2018	13 Apr 2018

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145485	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

HOLDING TIME SUMMARY

SE177801 R1

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SP01/01	SE177801.001	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/02	SE177801.002	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP01/03	SE177801.003	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/01	SE177801.004	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/02	SE177801.005	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018
SP02/03	SE177801.007	LB145431	09 Apr 2018	10 Apr 2018	23 Apr 2018	12 Apr 2018	22 May 2018	13 Apr 2018

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	105
	SP01/02	SE177801.002	%	60 - 130%	105
	SP01/03	SE177801.003	%	60 - 130%	89
	SP02/01	SE177801.004	%	60 - 130%	98
	SP02/02	SE177801.005	%	60 - 130%	104
	SP02/03	SE177801.007	%	60 - 130%	70

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SP01/01	SE177801.001	%	70 - 130%	96
	SP01/02	SE177801.002	%	70 - 130%	104
	SP01/03	SE177801.003	%	70 - 130%	102
	SP02/01	SE177801.004	%	70 - 130%	104
	SP02/02	SE177801.005	%	70 - 130%	106
	SP02/03	SE177801.007	%	70 - 130%	86
d14-p-terphenyl (Surrogate)	SP01/01	SE177801.001	%	70 - 130%	108
	SP01/02	SE177801.002	%	70 - 130%	114
	SP01/03	SE177801.003	%	70 - 130%	114
	SP02/01	SE177801.004	%	70 - 130%	114
	SP02/02	SE177801.005	%	70 - 130%	114
	SP02/03	SE177801.007	%	70 - 130%	98
d5-nitrobenzene (Surrogate)	SP01/01	SE177801.001	%	70 - 130%	78
	SP01/02	SE177801.002	%	70 - 130%	74
	SP01/03	SE177801.003	%	70 - 130%	74
	SP02/01	SE177801.004	%	70 - 130%	72
	SP02/02	SE177801.005	%	70 - 130%	78
	SP02/03	SE177801.007	%	70 - 130%	76

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	105
	SP01/02	SE177801.002	%	60 - 130%	105
	SP01/03	SE177801.003	%	60 - 130%	89
	SP02/01	SE177801.004	%	60 - 130%	98
	SP02/02	SE177801.005	%	60 - 130%	104
	SP02/03	SE177801.007	%	60 - 130%	70

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	76
	SP01/02	SE177801.002	%	60 - 130%	82
	SP01/03	SE177801.003	%	60 - 130%	82
	SP02/01	SE177801.004	%	60 - 130%	72
	SP02/02	SE177801.005	%	60 - 130%	73
	SP02/03	SE177801.007	%	60 - 130%	79
d4-1,2-dichloroethane (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	110
	SP01/02	SE177801.002	%	60 - 130%	108
	SP01/03	SE177801.003	%	60 - 130%	118
	SP02/01	SE177801.004	%	60 - 130%	115
	SP02/02	SE177801.005	%	60 - 130%	103
	SP02/03	SE177801.007	%	60 - 130%	103
d8-toluene (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	126
	SP01/02	SE177801.002	%	60 - 130%	118
	SP01/03	SE177801.003	%	60 - 130%	114
	SP02/01	SE177801.004	%	60 - 130%	109
	SP02/02	SE177801.005	%	60 - 130%	115
	SP02/03	SE177801.007	%	60 - 130%	116
Dibromofluoromethane (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	89
	SP01/02	SE177801.002	%	60 - 130%	81
	SP01/03	SE177801.003	%	60 - 130%	73
	SP02/01	SE177801.004	%	60 - 130%	86
	SP02/02	SE177801.005	%	60 - 130%	83

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued) — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	SP02/03	SE177801.007	%	60 - 130%	72

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	76
	SP01/02	SE177801.002	%	60 - 130%	82
	SP01/03	SE177801.003	%	60 - 130%	82
	SP02/01	SE177801.004	%	60 - 130%	72
	SP02/02	SE177801.005	%	60 - 130%	73
	SP02/03	SE177801.007	%	60 - 130%	79
d4-1,2-dichloroethane (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	110
	SP01/02	SE177801.002	%	60 - 130%	108
	SP01/03	SE177801.003	%	60 - 130%	118
	SP02/01	SE177801.004	%	60 - 130%	115
	SP02/02	SE177801.005	%	60 - 130%	103
	SP02/03	SE177801.007	%	60 - 130%	103
d8-toluene (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	126
	SP01/02	SE177801.002	%	60 - 130%	118
	SP01/03	SE177801.003	%	60 - 130%	114
	SP02/01	SE177801.004	%	60 - 130%	109
	SP02/02	SE177801.005	%	60 - 130%	115
	SP02/03	SE177801.007	%	60 - 130%	116
Dibromofluoromethane (Surrogate)	SP01/01	SE177801.001	%	60 - 130%	89
	SP01/02	SE177801.002	%	60 - 130%	81
	SP01/03	SE177801.003	%	60 - 130%	73
	SP02/01	SE177801.004	%	60 - 130%	86
	SP02/02	SE177801.005	%	60 - 130%	83
	SP02/03	SE177801.007	%	60 - 130%	72

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB145441.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB145485.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB145485.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	86
		2-fluorobiphenyl (Surrogate)	%	-	92
		d14-p-terphenyl (Surrogate)	%	-	100

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB145485.001	Arochlor 1016	mg/kg	0.2	<0.2
	Arochlor 1221	mg/kg	0.2	<0.2
	Arochlor 1232	mg/kg	0.2	<0.2
	Arochlor 1242	mg/kg	0.2	<0.2
	Arochlor 1248	mg/kg	0.2	<0.2
	Arochlor 1254	mg/kg	0.2	<0.2

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB145485.001		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	97

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result
LB145473.001		Arsenic, As	mg/kg	3	<3
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.3	<0.3
		Copper, Cu	mg/kg	0.5	<0.5
		Nickel, Ni	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB145485.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB145431.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	104
		d4-1,2-dichloroethane (Surrogate)	%	-	111
		d8-toluene (Surrogate)	%	-	110
		Bromofluorobenzene (Surrogate)	%	-	104
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB145431.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	101
		d4-1,2-dichloroethane (Surrogate)	%	-	110
		d8-toluene (Surrogate)	%	-	109

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177640.004	LB145441.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE177801.002	LB145441.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177693.004	LB145459.022	% Moisture	%w/w	0.5	2.2	2.2	75	0
SE177801.001	LB145459.033	% Moisture	%w/w	0.5	10	10	40	0
SE177801.017	LB145459.040	% Moisture	%w/w	0.5	8.8	8.8	41	0

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177801.004	LB145485.014		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.17	30	14

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177801.004	LB145485.014	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	197	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177801.004	LB145485.014		Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.6	30	0

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177801.004	LB145485.014		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	14

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177662.015	LB145473.014		Arsenic, As	mg/kg	3	13	7	40	61 ②
			Cadmium, Cd	mg/kg	0.3	0.4	<0.3	134	18
			Chromium, Cr	mg/kg	0.3	13	12	34	14
			Copper, Cu	mg/kg	0.5	67	40	31	51 ②
			Nickel, Ni	mg/kg	0.5	4.7	5.3	40	12
			Lead, Pb	mg/kg	1	16	14	36	13
			Zinc, Zn	mg/kg	0.5	26	21	38	23
SE177801.017	LB145473.024		Arsenic, As	mg/kg	3	4	5	51	26
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
			Chromium, Cr	mg/kg	0.3	13	12	34	1
			Copper, Cu	mg/kg	0.5	22	22	32	3
			Nickel, Ni	mg/kg	0.5	4.2	4.7	41	10
			Lead, Pb	mg/kg	1	15	15	37	5
			Zinc, Zn	mg/kg	0.5	28	26	37	8

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177801.004	LB145485.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177783.009	LB145431.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.3	50	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	4.9	50	15

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177783.009	LB145431.014	Surrogates	d8-toluene (Surrogate)	mg/kg	-	5.4	5.3	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.8	50	6
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE177797.001	LB145431.023	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.8	50	15
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.6	4.9	50	14
			d8-toluene (Surrogate)	mg/kg	-	6.1	5.7	50	7
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.0	4.1	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE177783.009	LB145431.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.3	30	5
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	4.9	30	15
			d8-toluene (Surrogate)	mg/kg	-	5.4	5.3	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.8	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE177797.001	LB145431.023		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.8	30	15
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.6	4.9	30	14
			d8-toluene (Surrogate)	mg/kg	-	6.1	5.7	30	7
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.0	4.1	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145441.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	106

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145485.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	97
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	94
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	90
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	93
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	95
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	89
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	95

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145485.002		Naphthalene	mg/kg	0.1	4.1	4	60 - 140	103
		Acenaphthylene	mg/kg	0.1	3.8	4	60 - 140	96
		Acenaphthene	mg/kg	0.1	4.3	4	60 - 140	107
		Phenanthrene	mg/kg	0.1	4.2	4	60 - 140	104
		Anthracene	mg/kg	0.1	4.0	4	60 - 140	101
		Fluoranthene	mg/kg	0.1	4.2	4	60 - 140	104
		Pyrene	mg/kg	0.1	4.1	4	60 - 140	101
		Benzo(a)pyrene	mg/kg	0.1	4.5	4	60 - 140	112
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145485.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	105

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145473.002	Arsenic, As	mg/kg	3	370	336.32	79 - 120	111
	Cadmium, Cd	mg/kg	0.3	470	416.6	69 - 131	112
	Chromium, Cr	mg/kg	0.3	35	35.2	80 - 120	100
	Copper, Cu	mg/kg	0.5	410	370.46	80 - 120	111
	Nickel, Ni	mg/kg	0.5	220	210.88	79 - 120	106
	Lead, Pb	mg/kg	1	110	107.87	79 - 120	103
	Zinc, Zn	mg/kg	0.5	320	301.27	80 - 121	108

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145485.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	100
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16	mg/kg	25	30	40	60 - 140	75
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	78
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	90

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145431.002	Monocyclic	Benzene	mg/kg	0.1	2.8	2.9	60 - 140	96
	Aromatic	Toluene	mg/kg	0.1	3.3	2.9	60 - 140	113
		Ethylbenzene	mg/kg	0.1	3.3	2.9	60 - 140	113
		m/p-xylene	mg/kg	0.2	7.1	5.8	60 - 140	122
		o-xylene	mg/kg	0.1	3.3	2.9	60 - 140	112
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d8-toluene (Surrogate)	mg/kg	-	4.7	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	5	60 - 140	105

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB145431.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	82
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	78
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	79
		d8-toluene (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	5	60 - 140	96
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	92

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE177783.008	LB145441.004	Mercury	mg/kg	0.05	0.27	0.08	0.2	95

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE177783.004	LB145473.004	Arsenic, As	mg/kg	3	57	7	50	100
		Cadmium, Cd	mg/kg	0.3	56	0.6	50	111
		Chromium, Cr	mg/kg	0.3	69	19	50	101
		Copper, Cu	mg/kg	0.5	110	58	50	109
		Nickel, Ni	mg/kg	0.5	64	11	50	107
		Lead, Pb	mg/kg	1	490	490	50	5 ⑤
		Zinc, Zn	mg/kg	0.5	240	220	50	34 ⑤

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE177720.001	LB145485.018		TRH C10-C14	mg/kg	20	48	0	40	120
			TRH C15-C28	mg/kg	45	53	8	40	113
			TRH C29-C36	mg/kg	45	45	0	40	113
			TRH C37-C40	mg/kg	100	<100	0	-	-
			TRH C10-C36 Total	mg/kg	110	150	0	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	0	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	48	0	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	0	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	14	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE177720.001	LB145431.004		TRH C6-C10	mg/kg	25	<25	0	24.65	87
			TRH C6-C9	mg/kg	20	<20	0	23.2	80
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.2	4.05	-	85
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	4.56	-	85
			d8-toluene (Surrogate)	mg/kg	-	5.4	4.7	-	108
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.0	3.55	-	80
		VPH F	Benzene (F0)	mg/kg	0.1	2.0	0.02	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-0.04	7.25	120

MATRIX SPIKE DUPLICATES

SE177801 R1

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

SAMPLE RECEIPT ADVICE

SE177801

CLIENT DETAILS

Contact	Craig Cowper
Client	ALLIANCE GEOTECHNICAL PTY LTD
Address	10 Welder Road Seven Hills NSW 2147
Telephone	0407 989 885
Facsimile	02 9675 1888
Email	c.cowper@allgeo.com.au
Project	**7161 Jordan Springs**
Order Number	**P1054**
Samples	17

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 10/4/2018
Report Due	Fri 13/4/2018
SGS Reference	**SE177801**

SUBMISSION DETAILS

This is to confirm that 17 samples were received on Tuesday 10/4/2018. Results are expected to be ready by COB Friday 13/4/2018. Please quote SGS reference SE177801 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	8 Soil, 9 Material
Date documentation received	10/4/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.4°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Results for asbestos analysis will be reported in SE177801A, on a standard TAT.
DUP01A has been forwarded to Eurofins.

SAMPLE RECEIPT ADVICE

SE177801

CLIENT DETAILS

Client ALLIANCE GEOTECHNICAL PTY LTD

Project 7161 Jordan Springs

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	SP01/01	29	26	11	7	10	12	8
002	SP01/02	29	26	11	7	10	12	8
003	SP01/03	29	26	11	7	10	12	8
004	SP02/01	29	26	11	7	10	12	8
005	SP02/02	29	26	11	7	10	12	8
007	SP02/03	29	26	11	7	10	12	8
017	DUP01	-	-	-	7	-	-	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE177801

CLIENT DETAILS

Client ALLIANCE GEOTECHNICAL PTY LTD

Project 7161 Jordan Springs

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content
001	SP01/01	1	1
002	SP01/02	1	1
003	SP01/03	1	1
004	SP02/01	1	1
005	SP02/02	1	1
007	SP02/03	1	1
017	DUP01	1	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: Alliance Geotechnical Pty Ltd
Address: 10 Welder Road, Seven Hills NSW
Contact Name: Craig Cowper

Project Name/No: 7161 Jordan Springs
Purchase Order No: SGS – P1054 Eurofins – P1055
Results Required By: 3 day turnaround
Telephone: 0407 989 885
Facsimile:
Email Results: c.cowper@allgeo.com.au

Client Sample ID	Date Sampled	Lab Sample ID	BUILDING MATERIAL	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH / BTEX	PAH	OCP	PCB	Metals (8)	Asbestos (0.001%)	Asbestos ID (Build Mat)
SP01/01	09/04/18	1		X	Ice	2	X	X	X	X	X	X	
SP01/02	09/04/18	2		X	Ice	2	X	X	X	X	X	X	
SP01/03	09/04/18	3		X	Ice	2	X	X	X	X	X	X	
SP02/01	09/04/18	4		X	Ice	2	X	X	X	X	X	X	
SP02/02	09/04/18	5		X	Ice	2	X	X	X	X	X	X	
SP02/02-FRAG	09/04/18	6	X		Ice	1							X
SP02/03	09/04/18	7		X	Ice	2	X	X	X	X	X	X	
SP03/FCS	09/04/18	8	X		Ice	1							X
SP04/FCS	09/04/18	9	X		Ice	1							X
SP05/FCS	09/04/18	10	X		Ice	1							X

SGS EHS Alexandria Laboratory

SE177801 COC
Received: 10 – Apr – 2018

Relinquished By: Craig Cowper — Date/Time: 06/03/18 @ 1300hrs — Received By: A. Odisho — Date/Time 10/4/18 @ 2:05pm
Relinquished By: — Date/Time: — Received By: — Date/Time
Samples Intact: (Yes)/ No — Temperature: Ambient / (Chilled) — Sample Cooler Sealed: Yes/ No — Laboratory Quotation No:
Comments:

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name:	Alliance Geotechnical Pty Ltd	Project Name/No:	7161 Jordan Springs
Address:	10 Welder Road,	Purchase Order No:	SGS – P1054 Eurofins – P1055
	Seven Hills NSW	Results Required By:	3 day turnaround
Contact Name:	Craig Cowper	Telephone:	0407 989 885
		Facsimile:	
		Email Results:	c.cowper@allgeo.com.au

Client Sample ID	Date Sampled	Lab Sample ID	BUILDING MATERIAL	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH / BTEX	PAH	OCP	Metals (8)	Asbestos (0.001%)	Asbestos ID (Build Mat)
SP06/FCS	09/04/18	11	X		Ice	1						X
SP07/FCS	09/04/18	12	X		Ice	1						X
SP08/FCS	09/04/18	13	X		Ice	1						X
SP09/FCS	09/04/18	14	X		Ice	1						X
SP10/FCS	09/04/18	15	X		Ice	2						X
SP11/FCS	09/04/18	16	X		Ice	1						X
DUP01	09/04/18	17		X	Ice	1				X		
DUP01A	09/04/18			X	Ice	1				X		

Send to Eurofins

Relinquished By: Craig Cowper	Date/Time: 10/04/18 @ 12:00pm	Received By: A. Odisho	Date/Time 10/4/18 @ 2:05pm
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments:		

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Craig Cowper
Client	ALLIANCE GEOTECHNICAL PTY LTD
Address	10 Welder Road Seven Hills NSW 2147
Telephone	0407 989 885
Facsimile	02 9675 1888
Email	c.cowper@allgeo.com.au
Project	**7161 Jordan Springs - Asbestos**
Order Number	**P1054**
Samples	17

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE177801A R0**
Date Received	10/4/2018
Date Reported	17/4/2018

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in soil samples using trace analysis technique as per AS 4964-2004.

Asbestos analysed by approved identifiers Ravee Sivasubramaniam.

SIGNATORIES

S. Ravendra.

Ravee Sivasubramaniam
Hygiene Team Leader

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 13/4/2018

PARAMETER	UOM	LOR	SP01/01 SOIL - 9/4/2018 SE177801A.001	SP01/02 SOIL - 9/4/2018 SE177801A.002	SP01/03 SOIL - 9/4/2018 SE177801A.003	SP02/01 SOIL - 9/4/2018 SE177801A.004	SP02/02 SOIL - 9/4/2018 SE177801A.005
Total Sample Weight*	g	1	**576**	**532**	**501**	**537**	**503**
ACM in >7mm Sample*	g	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	ORG,NAD	ORG,NAD	NAD	ORG,NAD	ORG,NAD

PARAMETER	UOM	LOR	SP02/03 SOIL - 9/4/2018 SE177801A.007
Total Sample Weight*	g	1	**426**
ACM in >7mm Sample*	g	0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001
Fibre Type*	No unit	-	ORG,NAD

Fibre ID in bulk materials [AN602] Tested: 17/4/2018

PARAMETER	UOM	LOR	SP02/02-FRAG MATERIAL - 9/4/2018 SE177801A.006	SP03/FCS MATERIAL - 9/4/2018 SE177801A.008	SP04/FCS MATERIAL - 9/4/2018 SE177801A.009	SP05/FCS MATERIAL - 9/4/2018 SE177801A.010	SP06/FCS MATERIAL - 9/4/2018 SE177801A.011
Asbestos Detected	No unit	-	Yes	Yes	Yes	Yes	Yes

PARAMETER	UOM	LOR	SP07/FCS MATERIAL - 9/4/2018 SE177801A.012	SP08/FCS MATERIAL - 9/4/2018 SE177801A.013	SP09/FCS MATERIAL - 9/4/2018 SE177801A.014	SP10/FCS MATERIAL - 9/4/2018 SE177801A.015	SP11/FCS MATERIAL - 9/4/2018 SE177801A.016
Asbestos Detected	No unit	-	Yes	Yes	Yes	Yes	Yes

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf). The fibres detected may or may not be asbestos fibres.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	AMO = Amosite Detected CRY = Chrysotile Detected CRO = Crocidolite Detected ORG = Organic Fibres Detected SMF = Synthetic Mineral Fibres Detected UMF = Unknown Mineral Fibres Detected NAD = No Asbestos Detected
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Craig Cowper
Client	ALLIANCE GEOTECHNICAL PTY LTD
Address	10 Welder Road Seven Hills NSW 2147
Telephone	0407 989 885
Facsimile	02 9675 1888
Email	c.cowper@allgeo.com.au
Project	**7161 Jordan Springs - Asbestos**
Order Number	**P1054**
Samples	10

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE177801A R0**
Date Received	10 Apr 2018
Date Reported	17 Apr 2018

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in soil samples using trace analysis technique as per AS 4964-2004.

Asbestos analysed by approved identifiers Ravee Sivasubramaniam.

SIGNATORIES

S. Ravee Sivasubramaniam
Hygiene Team Leader

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE177801A.006	SP02/02-FRAG	Other	35x30x4mm Cement Sheet Fragment	09 Apr 2018	Chrysotile Asbestos Detected	
SE177801A.008	SP03/FCS	Other	80x65x10mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.009	SP04/FCS	Other	60x50x10mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.010	SP05/FCS	Other	35x20x5mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.011	SP06/FCS	Other	40x30x8mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.012	SP07/FCS	Other	50x40x10mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.013	SP08/FCS	Other	20x20x7mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.014	SP09/FCS	Other	90x50x8mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	
SE177801A.015	SP10/FCS	Other	40x30x10mm Cement Sheet Fragment	09 Apr 2018	Chrysotile Asbestos Detected	
SE177801A.016	SP11/FCS	Other	65x30x10mm Cement Sheet Fragment	09 Apr 2018	Chrysotile & Crocidolite Asbestos Detected	

METHOD SUMMARY

SE177801A R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf). The fibres detected may or may not be asbestos fibres.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

SAMPLE RECEIPT ADVICE

SE177801A

CLIENT DETAILS

Contact	Craig Cowper
Client	ALLIANCE GEOTECHNICAL PTY LTD
Address	10 Welder Road Seven Hills NSW 2147
Telephone	0407 989 885
Facsimile	02 9675 1888
Email	c.cowper@allgeo.com.au
Project	**7161 Jordan Springs - Asbestos**
Order Number	**P1054**
Samples	17

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 10/4/2018
Report Due	Mon 16/4/2018
SGS Reference	**SE177801A**

SUBMISSION DETAILS

This is to confirm that 17 samples were received on Tuesday 10/4/2018. Results are expected to be ready by COB Monday 16/4/2018. Please quote SGS reference SE177801A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	16 Soil
Date documentation received	10/4/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5.4°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

SAMPLE RECEIPT ADVICE

SE177801A

CLIENT DETAILS

Client ALLIANCE GEOTECHNICAL PTY LTD

Project 7161 Jordan Springs - Asbestos

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre ID in bulk materials	Gravimetric Determination of Asbestos in Soil
001	SP01/01	-	9
002	SP01/02	-	9
003	SP01/03	-	9
004	SP02/01	-	9
005	SP02/02	-	9
006	SP02/02-FRAG	1	-
007	SP02/03	-	9
008	SP03/FCS	1	-
009	SP04/FCS	1	-
010	SP05/FCS	1	-
011	SP06/FCS	1	-
012	SP07/FCS	1	-
013	SP08/FCS	1	-
014	SP09/FCS	1	-
015	SP10/FCS	1	-
016	SP11/FCS	1	-

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: Alliance Geotechnical Pty Ltd
Address: 10 Welder Road, Seven Hills NSW
Contact Name: Craig Cowper

Project Name/No: 7161 Jordan Springs
Purchase Order No: SGS – P1054 Eurofins – P1055
Results Required By: 3 day turnaround
Telephone: 0407 989 885
Facsimile:
Email Results: c.cowper@allgeo.com.au

Client Sample ID	Date Sampled	Lab Sample ID	BUILDING MATERIAL	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH / BTEX	PAH	OCP	PCB	Metals (8)	Asbestos (0.001%)	Asbestos ID (Build Mat)
SP01/01	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP01/02	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP01/03	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP02/01	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP02/02	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP02/02-FRAG	09/04/18		X		Ice	1							X
SP02/03	09/04/18			X	Ice	2	X	X	X	X	X	X	
SP03/FCS	09/04/18		X		Ice	1							X
SP04/FCS	09/04/18		X		Ice	1							X
SP05/FCS	09/04/18		X		Ice	1							X

SGS EHS Alexandria Laboratory
SE177801A COC
Received: 10 – Apr – 2018

Relinquished By: Craig Cowper — Date/Time: 06/03/18 @ 1300hrs — Received By: A. Odisho — Date/Time 10/4/18 @ 2:05pm
Relinquished By: — Date/Time: — Received By: — Date/Time
Samples Intact: Yes/ No — Temperature: Ambient / Chilled — Sample Cooler Sealed: Yes/ No — Laboratory Quotation No:
Comments:

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: Alliance Geotechnical Pty Ltd
Address: 10 Welder Road,
Seven Hills NSW

Contact Name: Craig Cowper

Project Name/No: 7161 Jordan Springs
Purchase Order No: SGS – P1054 Eurofins – P1055
Results Required By: 3 day turnaround
Telephone: 0407 989 885
Facsimile:
Email Results: c.cowper@allgeo.com.au

Client Sample ID	Date Sampled	Lab Sample ID	BUILDING MATERIAL	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH / BTEX	PAH	OCP	Metals (8)	Asbestos (0.001%)	Asbestos ID (Build Mat)
SP06/FCS	09/04/18		X		Ice	1						X
SP07/FCS	09/04/18		X		Ice	1						X
SP08/FCS	09/04/18		X		Ice	1						X
SP09/FCS	09/04/18		X		Ice	1						X
SP10/FCS	09/04/18		X		Ice	2						X
SP11/FCS	09/04/18		X		Ice	1						X
DUP01	09/04/18			X	Ice	1				X		
DUP01A	09/04/18			X	Ice	1				X		

Send to Eurofins

Relinquished By: Craig Cowper	Date/Time: 10/04/18 @ 12:00pm	Received By: A. Odisho	Date/Time 6/4/18 @ 2:05pm
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments:		

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

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: **Craig Cowper**

Report **593593-S**
Project name JORDAN SPRINGS
Project ID 7161
Received Date Apr 12, 2018

Client Sample ID			**DUP01A**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S18-Ap12479**
Date Sampled			**Apr 09, 2018**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	7.2
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	14
Copper	5	mg/kg	22
Lead	5	mg/kg	18
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	6.8
Zinc	5	mg/kg	27
% Moisture	1	%	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
Metals M8	Sydney	Apr 13, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Apr 12, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

ABN– 50 005 085 521
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2-5 Kingston Town Close
Oakleigh VIC 3166
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NATA # 1261
Site # 1254 & 14271

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

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

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

Company Name:	Alliance Geotechnical	**Order No.:**	P1055	**Received:**	Apr 12, 2018 2:43 PM
Address:	10 Welder Road Seven Hills NSW 2147	**Report #:**	593593	**Due:**	Apr 17, 2018
		Phone:	1800 288 188	**Priority:**	3 Day
		Fax:	02 9675 1888	**Contact Name:**	Craig Cowper
Project Name:	JORDAN SPRINGS				
Project ID:	7161				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	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	DUP01A	Apr 09, 2018		Soil	S18-Ap12479	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/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. 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	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
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							
Heavy Metals							
Arsenic	%	94			70-130	Pass	
Cadmium	%	101			70-130	Pass	
Chromium	%	107			70-130	Pass	
Copper	%	113			70-130	Pass	
Lead	%	96			70-130	Pass	
Mercury	%	114			70-130	Pass	
Nickel	%	115			70-130	Pass	
Zinc	%	108			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	S18-Ap14616	NCP	%	96			70-130	Pass	
Cadmium	S18-Ap14616	NCP	%	95			70-130	Pass	
Chromium	S18-Ap14616	NCP	%	73			70-130	Pass	
Copper	S18-Ap14616	NCP	%	82			70-130	Pass	
Lead	S18-Ap12327	NCP	%	81			70-130	Pass	
Mercury	S18-Ap14616	NCP	%	100			70-130	Pass	
Nickel	S18-Ap14616	NCP	%	77			70-130	Pass	
Zinc	S18-Ap12327	NCP	%	111			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Ap13016	NCP	mg/kg	7.2	6.8	5.0	30%	Pass	
Cadmium	S18-Ap13016	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Ap13016	NCP	mg/kg	12	11	4.0	30%	Pass	
Copper	S18-Ap13016	NCP	mg/kg	20	22	7.0	30%	Pass	
Lead	S18-Ap13016	NCP	mg/kg	17	17	2.0	30%	Pass	
Mercury	S18-Ap13016	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Ap13016	NCP	mg/kg	5.3	< 5	18	30%	Pass	
Zinc	S18-Ap13016	NCP	mg/kg	23	21	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S18-Ap12479	CP	%	11	9.6	11	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

Nibha Vaidya Analytical Services Manager

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

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

Company Name:	Alliance Geotechnical	**Order No.:**	P1055	**Received:**	Apr 12, 2018 2:43 PM
Address:	10 Welder Road Seven Hills NSW 2147	**Report #:**	593593	**Due:**	Apr 17, 2018
		Phone:	1800 288 188	**Priority:**	3 Day
		Fax:	02 9675 1888	**Contact Name:**	Craig Cowper
Project Name:	JORDAN SPRINGS				
Project ID:	7161				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	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	DUP01A	Apr 09, 2018		Soil	S18-Ap12479	X	X
Test Counts						1	1

eurofins | mgt

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
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Site # 1254 & 14271

Sydney
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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
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Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

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

Sample Receipt Advice

Company name:	**Alliance Geotechnical**
Contact name:	Craig Cowper
Project name:	JORDAN SPRINGS
Project ID:	7161
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	Apr 12, 2018 2:43 PM
Eurofins | mgt reference:	**593593**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

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

Results will be delivered electronically via e.mail to Craig Cowper - c.cowper@allgeo.com.au.

CHAIN OF CUSTODY & ANALYSIS REQUEST

Page __2__ of __2__

SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name:	Alliance Geotechnical Pty Ltd	Project Name/No:	7161 Jordan Springs
Address:	10 Welder Road,	Purchase Order No:	SGS – P1054 Eurofins – P1055
	Seven Hills NSW	Results Required By:	3 day turnaround
		Telephone:	0407 989 885
Contact Name:	Craig Cowper	Facsimile:	
		Email Results:	c.cowper@allgeo.com.au

Client Sample ID	Date Sampled	Lab Sample ID	BUILDING MATERIAL	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH / BTEX	PAH	OCP	Metals (8)	Asbestos (0.001%)	Asbestos ID (Build Mat)										
SP06/FCS	09/04/18		X		Ice	1						X										
SP07/FCS	09/04/18		X		Ice	1						X										
SP08/FCS	09/04/18		X		Ice	1						X										
SP09/FCS	09/04/18		X		Ice	1						X										
SP10/FCS	09/04/18		X		Ice	2						X										
SP11/FCS	09/04/18		X		Ice	1						X										
DUP01	09/04/18			X	Ice	1				X												
DUP01A	09/04/18			X	Ice	1				X												Send to Eurofins

Relinquished By: Craig Cowper	Date/Time: 10/04/18 @ 12:00pm	Received By: A. Odisho	Date/Time 10/4/18 @ 2:05pm
Relinquished By:	Date/Time:	Received By:	Date/Time 12/04/18 2:43pm
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No: #593593.
	Comments:		