GeoEnvironmental Pty Ltd
Geotechnical and Environmental Solutions

PRELIMINARY SITE INVESTIGATION

FOR

AMJ DEMOLITION AND EXCAVATION

55 Martin Road, Badgerys Creek, New South Wales

Report No: 18/0089

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EXECUTIVE SUMMARY

The report describes the methodology and results of a preliminary site investigation (PSI) carried out by STS GeoEnvironmental Pty Ltd (STS) at 55 Martin Road, Badgerys Creek, New South Wales (the 'site'). The assessment was carried out at the request of Claron Consulting Pty Ltd on behalf of AMJ Demolition and Excavation Pty Ltd.

The aim of the PSI is to provide a preliminary assessment of the potential occurrence and extent of contamination at the site and assess any potential risk to human health and environment with respect to a proposed "Waste Resource Recovery Facility" at the site. Further, the results of the investigation will support an Environmental Impact Assessment (EIA) to be carried with respect to the proposed redevelopment the site.

The investigation was performed in accordance with Environment Protection Authority (EPA) and national guidelines for the assessment and management of site contamination.

The site is approximately 2.54ha in area and is currently rural residential land use. Our historical review indicates that that no agricultural activities have occurred since 1940. The only development at the site occurred in the mid 1980s which comprises the construction of a single storey brick residence on the eastern end of the site. Later, a metal shed was constructed west of the residence. No other facilities or installations appear to have been located on the property.

Soil samples were collected in nineteen boreholes at targeted locations across the site as part of the PSI. The soil samples were analysed to screen a range of both organic and inorganic contaminants. The results indicate no exceedances of the site assessment criteria nor the presence of asbestos.

Potential contaminants in the soil at the site are present at low levels and would not present an unacceptable risk to human-health or the environment for a commercial/industrial setting. We consider that no further investigation is required at the site.

Therefore, the site is considered to be suitable for the proposed "Waste Resource Recovery Facility" in its current condition.

1. INTRODUCTION

The report presents the results of a Preliminary Site Investigation (PSI) carried out by STS GeoEnvironmental Pty Ltd (STS) at 55 Martin Road, Badgerys Creek, New South Wales (the 'site'). The assessment was carried out at the request of Claron Consulting Pty Ltd on behalf of AMJ Group.

The objective of the PSI is to provide a preliminary assessment of the potential occurrence and extent of contamination at the site and assess any potential risk to human health and environment with respect to a proposed "Waste Resource Recovery Facility" at the site. Further, the investigation would support an Environmental Impact Assessment (EIA) for the proposed redevelopment.

The investigation was performed in accordance with Environment Protection Authority (EPA) and other national guidelines related to the assessment and management of site contamination.

The scope of the PSI included:

- examination of aerial photographs and satellite imagery to identify historical land uses at the site and its surrounds;
- review records held by EPA;
- site inspection;
- appraisal of the potential for surrounding land uses to cause site contamination;
- appraisal of local geology and hydrogeology;
- soil sampling from nineteen boreholes and laboratory analysis of selected soil samples for a broad range of potential contaminants;
- assessment of analytical data and quality assurance (QA);
- appraisal of the contaminant concentrations in the soil at the site, including an appraisal of potential harm to human-health and the environment, potential contaminant exposure pathways and off-site impacts;
- recommendations for any further investigation or remediation that may be required based on relevant guidelines on the assessment and management of site contamination; and
- preparation of a confidential report on the results of the investigation.

Our scope of work includes a geotechnical investigation of the site. Results are given in our Report Number 17/3905 dated January 2018 and should be read in conjunction with the current report.

2. REDEVELOPMENT AND PROPOSED LAND USE

We understand that the site is proposed to be developed as a "Waste Resource Recovery Facility". Activities at the proposed facility comprise recycling of construction materials for reuse.

Bulk earthworks are anticipated at the site during the construction of the facility. Proposed features at the facility will include a site office/showroom, parking lots, a 1540m^2 colourbond shed, processing and stockpiling areas, hardstand truck turning bays, a weight bridge, site drainage structures and a sedimentation basin. The existing dam on the west of the site will be backfilled with its existing surrounds to be retained. Further, the remaining areas of the proposed compound will be covered with compacted road base or landscaped. The layout plan of the proposed facility is presented on Drawing No.18/0089/5.

Further, the remaining areas of the proposed compound will be covered with compacted road base or landscaped.

3. SITE IDENTIFICATION

The site, which is roughly rectangular and covers an area of approximately 2.54ha, is legally defined as Lot 4 in Deposited Plan (DP) 611519, Parish of Bringelly, County of Cumberland. The property has an approximate 90m frontage to Martin Road to the east. Vacant rural land and rural residential/agricultural land form the boundaries to the north and south respectively. Lawson Road borders the site to the west. The site location is shown on Drawing No. 18/0089/1.

The site is within the Liverpool Council local government area, and is currently zoned 'RU1-Primary Production. Development at the site is managed under "Liverpool LEP 2008".

4. PREVIOUS ENVIRONMENTAL REPORTS

No previous environmental assessment reports are known to have been prepared for the site.

5. SITE FEATURES

The site was inspected on 13 December 2017 to assess its current conditions and to identify potential existing contamination sources at the site and surrounds. A plan showing the current site configuration is shown on Drawing No. 18/0089/2.

The key site features as determined by the site inspection are:

- a fenced area of about 2900m^2 with 42m frontage to Martin Road encompasses a single storey brick residence, a gravel driveway, a metal shed. The soil was grassed covered and with some mature trees located to the south and west of the residence.

- the remaining area of the site is undeveloped and covered with thick grass. Overgrown vegetation was identified along a strip of land along Lawson road.
- a dam with a footprint of about 40m^2 is located on the north-western quadrant.
- levels at the site drops for about 6m westwards from Martin Road.
- identification of site filling not possible because of the thick grass cover.
- olfactory observations indicated no possible source of onsite contamination.

6. GEOLOGY AND HYDROGEOLOGY

Reference to the Geological Map of Penrith (Sheet 9029-9129) shows that the site is underlain by "Bringelly Shake", which comprises shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff.

The natural soils encountered on the site during this investigation consisted of brown/dark-brown/red-brown and grey silty clays with traces of sand. These soils are originated from in-situ weathering of the regional geological formations.

The subsurface conditions generally consist of topsoil overlying silty clays, sandy clays and weathered sandstone and shale. Topsoil materials were encountered across the site in all boreholes to depths of 0.3 to 0.5 metres. Natural silty clays and sandy clays were encountered below the topsoil to depths of 1.3 to 3.6 metres.

A review of the acid sulfate soil (ASS) risk map of Liverpool, sheet number 9030S2 (2ed. 1997), indicates that acid sulphate soil materials are unlikely to be present at the site.

During the advancement of the boreholes, which extended to a maximum depth of 4.3m below the land surface at BH15, no free-flowing groundwater was encountered.

A search of the groundwater database of the "NSW Office of Water" was carried out to substantiate information on the likely hydrogeological conditions at the site. The search confirmed the presence of one registered domestic/stock bore within a 500m radius of the site. The bore is located to the south of the site and was advanced to a depth of 252.5m below the existing land surface.

The aquifer depths in the bore are reported to be between 137.5 m to 1328 m, 155.5m to 155.7m and 207m to 210m. The aquifer lithology is reported to comprise of sandstone.

Based on the observations made during the on-site soil sampling activities, the results of the groundwater database search, the findings of the recent geotechnical investigation at the site (17-3905) and our review of the site geology, a summary of the site hydrogeology is shown in Table 6.1 below.

Table 6.1 – Site Hydrogeology

Aquifer Type and Lithology:	Sandstone[1]
Perched groundwater:	Not expected to be present[1,2]
Depth to Regional Aquifer at Site:	>50 m[1,2]
Local Groundwater Flow Direction:	West, towards key receiving environment[2]
Regional Groundwater Flow Direction:	West, towards key receiving environment[2]
Receiving Environments:	Badgerys Creek 500 m to the west into South Creek then Hawkesbury River, located approximately 12 km to the north of the site[2].

[1] Actual conditions based on observations made during on-site drilling and sampling.
[2] Inferred conditions based on site/regional geology and geomorphology.

7. SITE HISTORY

STS GeoEnvironmental Pty Ltd (STS) researched the following sources of historical information:

- Aerial photographs of the site and surrounding areas held by the NSW Department of Lands;
- Section 149(2) Certificate provided by Liverpool City Council;
- SafeWork NSW
- Historical land titles; and
- NSW EPA records.

7.1 Aerial Photographs

Aerial photographs of the site and surrounds dated; 1947,1961, 1970, 1986, 1994, 2007, 2014, 2016 and 2017 were obtained from Land and Property Information (LPI) NSW. A summary of the observations made from the photographs are presented in Table 7.1 below. Copies of the selected aerial photographs are provided in Appendix A.

Table 7.1 – Aerial Photograph and Satellite Image Observations

Year	Site Features	Surrounding Land Use
1947	The site comprises built structures and a dam on the north-eastern and north-western quadrant respectively. Ground disturbance is visible along Martin Road. The remaining area is vegetation covered.	Surrounding land is predominantly vacant and undeveloped, although structures inferred to be associated with agricultural activities visible to the west and downslope of the site.
1961	Vegetation around built structures cleared and the water level in the dam has decreased considerably.	The surrounding properties remain largely unchanged, although construction of new structures is apparent further north and northeast.
1970	No significant changes identified.	Establishment of new farms further north and redevelopment on properties west and southwest to the site.
1986	Seepage/spill, from a dam from the adjacent property due south, runs north-westerly along a swale towards the dam located on site.	Development on the property immediately north and south of the site. Single storey residences, swimming pool, shed and market garden/orchard visible (inferred). Increased in farming activities apparent on remaining surrounding land.
1994	Site structures removed, and a single storey residence constructed at about the same location. Localised greener patches of vegetation inferred to be eutrophication identified on site.	Extension of the market garden immediately south of the site. Increasing agricultural development apparent on surrounding lands.
2007	The site remains essentially unchanged.	Market gardening ceased on the property immediately south of the site. Considerable ground disturbance further north and an orchard identified two properties south of the site. Site filling identified on neighbouring lands.
2014	No significant changes identified.	More site filling in progress identified on properties in the locality. Junkyards established northeast and southwest of the site.
2016	No significant changes identified.	Built structures associated to farming removed on surrounding lands, except for one property north of the site. Decline of farming activities inferred on surrounding land.
2017	No significant changes identified.	Material stockpiles visible on a property north to the site. A junkyard established southeast of the site.

7.2 Section 149 (2)

A copy of the Planning Certificate for the site issued under section 149(2) obtained from Liverpool Council, is presented in Appendix B. A review of the document indicates that no notice had been issued for the site related to contamination risks under the provisions of the *Contaminated Land Management Act*. Further, the site had never been subjected to a Site Audit.

7.3 Historical Title Search

Copies of the historical land title transfers were obtained from the Land Titles Office, and are provided in Appendix C. Tables 7.2 below summarises the ownership of the site covered under this assessment. The activities of the owners/occupants are given where applicable and are based on the title documentation and/or an internet search.

Table 7.2 – Historical land title summary (Ownership) for lot 4 in DP611519

Period	Registered Owners	Occupation
6 May 1998 to date	Helen Nobbs & Jeffrey Nobbs	N/A
1 June 1981 to 6 May 1998	Kenneth John Nobbs & Jeffrey Nobbs	Famers
15 April 1943 to 1 June 1981	Mervyn Joseph Nobbs	Farmer
6 May 1930 to 15 April 1943	The Sydney City Mission	N/A

7.4 NSW EPA Records

STS GeoEnvironmental Pty Ltd conducted a search of the NSW EPA contaminated land records and the POEO public register on the 5 January 2018. The following was noted:

- no EPA notices have been issued to the site or any other site within a 500m radius under the CLM Act 1997.
- a search for the suburb of "Badgerys Creek" indicates that no site has been subjected to any type of EPA notices issued under CLM Act 1997.

A search of the POEO public register indicates that EPA issued a licence for waste "storage and composting" at a property located at 210 Martin Road, about 1.3km south east of the site.

7.5 SafeWork NSW

Our search of the SafeWork NSW records indicates that no storage of "Hazardous Chemicals" occurred at the site. The notification is given in Appendix D.

7.6 Site History Summary

Based on the historical information review, we believe that the site has been used mostly for residential purposes as there is no evidence of any other activities at least from 1947 onwards.

Built structures initially located on north-eastern quadrant of the property were removed and a single storey brick residence was constructed at about the same location. A shed was later erected to the south of the residence as witnessed by the 2007's aerial photograph. No other facilities or installations have been located on the property

Most of the surrounding land have been vacant until 1961. Development in the vicinity was gradual and involved establishment of farms and/or residences. Farming activities in the area declined past the year 2000. Recent satellite imagery, dated 2016 and 2017, indicates the cessation of agricultural activities on neighbouring lands. Surrounding properties located further from the site share the same site history. However, recent historical data indicates the installation of junkyards in the area.

8. APPRAISAL OF POTENTIAL CONTAMINATION SOURCES

Based on our site history review and site inspection, an appraisal of the potential contamination risks at the site has been performed, the results of which are summarised in Table 8.1.

Table 8.1 – Contamination risk analysis

Source	Location	Contamination Pathway Analysis	Potential for Impacts
Presence weathered construction materials including asbestos	Surface soil across the site	Inadvertent ingestion, direct contact, dust inhalation.	High for soil and low for groundwater.
Contaminated seepage/spill from dam on adjacent site	Soil along drainage line connecting the dam at the site to a dam located on the adjacent site due south.	Inadvertent ingestion, direct contact, dust inhalation.	High for soil and low for groundwater.
Historical use of pesticides on adjacent site	Surface soil across the site/dam sediments	Inadvertent ingestion, direct contact, dust inhalation.	Low to moderate for soil and low for groundwater

Currently potential receptors are mainly the occupant of the residence located at the site, visitors and maintenance workers. Construction workers and visitors will be the only receptors during the implementation of the project.

During the operation of the proposed facility, employees working in the yard and maintenance workers might be the main receptors to potential contaminants.

Pathways to contaminant exposures for all the potential receptors mentioned above would be mostly through inadvertent ingestion and inhalation.

On the other and, ecological receptors at the site are limited to the fauna and flora which live/grow within the site boundary.

9. DATA QUALITY OBJECTIVES

The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM) (updated April 2013) and Australian Standard (AS) 4482.1-2005 recommend that data quality objectives (DQOs) be implemented during the investigation of potentially contaminated sites. The DQO process described in AS 4482.1-2005 outlines seven distinct steps which are designed to ensure an investigation is performed in a structured and efficient manner. The seven steps and the associated processes that were implemented to ensure data, hence decision making is of quality, are outlined below:

Step 1 – State the Problem

The site is proposed to be redeveloped as a "Waste Resource Recovery Facility". Prior to this assessment there was insufficient data to determine whether in its current condition the site is suitable for the intended end use.

Step 2 – Identify the Decision

To determine if the concentrations of contaminants in the soil at the site are likely to present an unacceptable risk to human-health or the environment in the setting specific to the intended use.

Step 3 – Identify Inputs to the Decision

To enable a decision regarding the contamination status of the site to be made, the following inputs were required:

- Soil sampling from nineteen boreholes, positioned randomly across the site;
- Analysis of the samples for a broad screen of potential chemical contaminants; and
- Implementation of a quality assurance/quality control (QA/QC) program.

Step 4 – Define the Study Boundaries

The assessment was undertaken within the boundaries of the site located at 55 Martin Road, Badgerys Creek, NSW. The boundaries of the site are defined in Section 3 and are shown on Drawing No. 18/0089/2.

Step 5 – Develop a Decision Rule

To determine if any soil impacts at the site are significant for the proposed use of the land as a "Waste Resource Recovery Facility", data were compared to relevant EPA endorsed criteria.

Step 6 - Specify Limits on Decision Errors

A field QA program was implemented, and acceptable error limits were defined to ensure the precision, accuracy, completeness and comparability of data. Further details are given in Section 11.

Step 7 – Optimize the Design for Obtaining Data

The following was implemented to ensure data collected are sufficient and reliable to enable the project objectives to be met:

- obtain soil samples from targeted locations across the site, sufficient to reach the main objective of a limited soil contamination assessment.
- collect, store and transport of soil samples in an appropriate manner to ensure sample integrity (refer to Section 10); and
- collect of an appropriate number of samples from each location
- based on our site history review and site inspection, an appropriate suite of chemical analyses was requested to screen the soil samples for contaminants potentially present in the soil at the site.

10. FIELD INVESTIGATION

The field activities for the investigation were undertaken by STS GeoEnvironmental on 12 December 2017. The assessment was performed in accordance with:

- EPA guidelines comprising:

  - *Contaminated Sites: Sampling Design Guidelines (1995)*;
  - *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (1997);
  - *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd Edition)* (2006); and
  - *Managing Asbestos in or on Soil (2014).*

- Guidelines issued under Schedule B of the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), Environment Protection and Heritage Council (EPHC)/National Environment Protection Council (NEPC), December 1999 (and updated NEPM April 2013);
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992 (ANZECC Guidelines);
- *Australian Standard 4482.1-2005: Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil – Part 1: Non-volatile and Semi-Volatile Compounds, Standards Australia* (2 November 2005);
- *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia,* Western Australian Department of Health (WA DOH) (2009); and
- *CRC Care Technical Report No. 10: Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater* (Friebel, E. & Nadebaum, P., 2011).

10.1 Soil Sampling

A drill rig with solid rotary augers was used to advance the boreholes. Soil samples comprising both fill and natural soil were recovered directly from the auger at nominated depths, referenced to the existing ground level at the borehole locations. The borehole locations are shown on Drawing No. 18/0089/3.

The soil samples were placed in new clean glass jars and/or 500 ml plastic zip locked bags provided by Australian Laboratory Services (ALS). All soil samples were recovered by a qualified environmental technician. New disposable latex gloves were used to recover each sample to avoid cross contamination.

Soil sample identifications and the description of the soil profiles encountered at each borehole location are described on the bore log sheets presented in Appendix E.

10.1.1 Soil Sample Handling and Equipment Decontamination

As mentioned above, each sample was recovered using new disposable latex gloves to prevent cross contamination. Sampling equipment was decontaminated before each sample was recovered. Decontamination was carried out using water and DECON 90.

Further, soil samples were recovered in glass jars leaving no headspace. The soil samples were not mixed to minimise the potential loss of volatile compounds from the soil matrix. The samples recovered were then placed in an iced-cooled container and transferred to ALS laboratory for analysis under a “Chain of Custody” (COC). The COC detailed the requested

analyses and was used to record the samples' history. A copy of the COC is presented in Appendix F.

10.1.2 Analytical Program for Soil Samples

The selection of analytes was based on our review of the historical data, site inspection observations, along with EPA NSW and NEPM (2013) contaminated site assessment guidelines. Selected soil samples were analysed for both inorganic and organic contaminants.

The analytes included heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), monocyclic aromatic hydrocarbons (MAHs), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), polychlorinated biphenyls (PCBs), phenolic compounds, and asbestos. The analytical program is illustrated in greater details in the COC in Appendix F.

ALS Sydney and ALS Brisbane, which are both NATA accredited, were selected as the primary and secondary analytical laboratory respectively. ALS Sydney was responsible for the analyses of the primary and intra-lab duplicate samples. Inter-lab duplicate analysis was carried out by ALS Brisbane.

11. QUALITY ASSURANCE PROGRAM

In compliance with the NEPM (2013) and AS 4482.1-2005, data quality assurance (QA) was a key component of this investigation. The QA allows the assessment of the integrity of soil samples recovered during the site investigation and accuracy of the laboratory analyses. The reliability of the analytical results, hence the representativeness of analytical data to characterise the site condition is thus appraised.

The QA procedures, actions and checks implemented during the investigation included:

- the utilisation of appropriate sampling methods in accordance with EPA requirements and NEPM (2013);
- appropriate sample handling and transportation, and analysis of samples within recommended analytical holding times;
- the collection and analysis of quality control (QC) samples;
- implementation of internal laboratory QC analyses; and
- the use of National Association of Testing Authorities (NATA) registered laboratory and analytical methods.

11.1 Quality Control Sampling

Inaccuracies in sampling and analytical programs can result from many causes, including collection of unrepresentative and inhomogeneous samples, cross contamination between

samples, unanticipated interferences between elements during laboratory analyses, equipment malfunctions and operator error. Inappropriate sampling, preservation, handling, storage and analytical techniques can also reduce the precision and accuracy of results.

A field-based QC program was implemented, and the results were compared to accepted criteria to assess its effectiveness. NEPM (2013) has documented procedures for QC sampling and analysis to ensure that the required level of accuracy and precision is obtained. NEPM (2013) and EPA guidelines recommend the use of two analytical laboratories for the implementation of a field QC program in addition to the internal QC procedures that are required to be followed by the laboratories in compliance to their NATA accreditation.

According to the NEPM (2013) the collection of intra- and inter-laboratory duplicate samples is required, along with blank samples. Intra-laboratory and inter-laboratory samples are duplicates of primary samples that are collected in the field. Intra-laboratory samples are analysed by the primary laboratory and are used as a check on the precision of the sampling and analytical procedures. Inter-laboratory samples are analysed by a secondary laboratory and provide a check of the accuracy of the analytical data.

According to the NEPM a split of a minimum of 10% of the primary samples as field duplicate samples (5% inter-laboratory and 5% intra-laboratory) as well as blank samples is required. Where less than 20 samples are to be analysed, a minimum of two field duplicate samples (one inter-laboratory and one intra-laboratory sample) and a blank sample is generally considered sufficient. Blank samples are generally collected daily during the sampling period and analysed where necessary.

For this contamination assessment, the following field quality control samples were collected and analysed:

- three intra-laboratory duplicate soil sample; and
- two inter-laboratory duplicate soil sample.

STS places an emphasis on implementing robust field-based decontamination procedures and sample collection/storage strategies. These are outlined in Section 10. By implementing the documented procedures STS considers that the accuracy and precision of the soil data used in this assessment has not been compromised. In view of this, the analysis of rinsate and trip blank samples was not considered necessary.

11.2 Quality Control Criteria

The analytical results of each duplicate were compared with the results for the primary sample using Relative Percent Difference (RPD). The RPD is defined as the absolute difference between two values divided by their mean.

Reference to AS 4482.1-2005 (and referenced in the NEPM) indicates that RPDs below 50% are considered to demonstrate a good correlation between duplicate sample results for inorganic species.

However, the same standard indicates possible higher RPDs for organics. Based on our experience, RPDs of up to 70% are considered acceptable for organic analytes. RPDs are not calculated when the analytical results for either the primary sample or the duplicate is less than the laboratory limits of reporting (LOR). RPDs of 100% or greater demonstrate a poor correlation, unless results are less than five times the analytical laboratory limits of reporting (LOR).

11.3 Laboratory Quality Control

A laboratory QC program involves the preparation and analysis of their own duplicate samples, reagent blanks and control samples (where the analyte concentration is known) or matrix spikes. Duplicate samples are subjected to the same preparation and analytical procedures as primary samples. The laboratories are required to analyse matrix spikes or control samples at a minimum frequency of 5% of the total number of primary samples in each sample batch.

The results of method blanks, duplicates and control sample analyses are compared by the laboratory to established quality assurance criteria for data precision and accuracy. If the results do not meet the criteria, then the analyses should be repeated. The relevant criteria are:

- method blanks should not return any positives on analysis;
- duplicate samples should not vary by more than 35% from the mean result; and
- control samples should generally give a recovery of 75-125%.

The laboratory QC program implemented for this assessment involved the preparation and analysis of laboratory duplicates, method blanks, laboratory control spike and surrogate samples. The results of the laboratory quality control are documented in Appendix G and indicate that the analytical results of the primary samples can be relied upon for the contamination assessment of the site.

12. ASSESSMENT CRITERIA

The *National Environmental Protection (Assessment of Site Contamination) Measure* (NEPM, *1999*, 2013) is the key national guideline on the assessment and management of site contamination. (NEPM, *1999*, 2013) guidelines are endorsed by the NSW EPA and the equivalent regulatory authorities in other Australian states.

The key NEPM criteria comprise Health-Based Investigation Levels (HILs) and the Ecologically-Based Investigation Levels (EILs)/Environmental Screening Levels (ESLs). The HILs are threshold values that are indicative of potential adverse impacts to human health.

EILs/ESLs are values that indicate potential phytotoxicity to plants and potential harm to other environment compartments.

EILs requires pH and Cation Exchange Capacity (CEC) data and in some cases the clay content of the soil. In the absence of pH and CEC data, EILs from NEPM (1999) are considered as screening levels for the evaluation of potential adverse (phytotoxic) impacts to vegetation.

In addition, the NEPM (2013) outlines criteria for key volatile hydrocarbon compounds which are designed to be protective of human-health via a soil vapour inhalation exposure pathway, the "Health Screening Levels" (HSLs).

Four classes of HIL are described in the NEPM (2013) to appraise the risks posed by site contamination for different land use settings. These include:

HIL Residential A: for a 'standard' residential land use with garden and accessible soil, including children's day care centres, preschools and primary schools;

HIL Residential B: for a residential land use with minimal opportunities for soil access, including properties with fully and permanently paved yard space such as high-rise apartment buildings and flats;

HIL Recreational C: for public open spaces, such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths, but excluding undeveloped public open space; and

HIL Commercial/Industrial D: for a commercial/industrial land use such as shops, offices, factories and industrial sites.

The HSLs outlined in the NEPM also include thresholds for the different land use settings as defined above, however, a combined set of criteria is provided that is to be applied for both Residential A and B land use settings.

Regarding the EILs and ESLs, a three-tiered set of criteria are provided for land uses including a) areas of ecological significance, b) urban residential and public open space, and c) commercial industrial.

The NEPM (2013) also outlines 'management limits' for petroleum hydrocarbons in soil which are designed to be thresholds which minimise the potential for light non-aqueous phase liquids (LNAPL) formation, fire and explosive hazards and penetration/damage to below ground infrastructure by hydrocarbons. These criteria are considered key when evaluating immediate impacts to human-health and the environment and long-term potential impacts associated with the on-site containment of contamination.

It is noted that the NEPM HILs do not include criteria for petroleum hydrocarbons, however, CRC Care's *Technical Report No. 10: Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater* (Friebel and Nadebaum, 2011) does provide health-based screening levels for key petroleum hydrocarbons based on the direct contact with

soil which may be used as alternative screening criteria. The 1999 NEPM also provides threshold HIL values for petroleum hydrocarbon fractions that may be adopted provided that speciation testing is undertaken for specific aromatic and aliphatic components.

Where a proposed land use will include more than one land use category (e.g. mixed residential/commercial development) the criteria which are protective of the most sensitive of the combined land uses should be adopted.

12.1 Criteria for this Assessment

As outlined in Section 2, the site is proposed to be redeveloped for use as a "Waste Resource Recovery Facility". Proposed installations of the facility include a site office/showroom, parking lots, a 1540m^2 colourbond shed, processing and stockpiling areas, concrete paved turning bays, a weight bridge, landscaped areas, site drainage structures and a sedimentation basin.

Reference to the proposed site plan indicates that the existing dam on the west of the site will be backfilled and a retention basin is proposed further east. Further, the existing vegetation surrounding the existing dam will remain. In addition, compacted road base is proposed for the remaining areas facility.

The preliminary plans of the redevelopment and activities to be carried out at the proposed facility indicate a Commercial/Industrial setting. Therefore, "Commercial/Industrial D" criteria are considered the most applicable and are adopted for this investigation. The Commercial/Industrial D criteria are designed to be protective of human-health for commercial/industrial land uses such as shops, offices, factories and industrial sites.

Further, a conservative approach has been adopted to evaluate potential adverse impacts of potential contaminants to all areas of vegetation to be kept to the proposed landscaped zones. To this end, the 2013 NEPM EILs/ESLs and management limits for "Urban Residential and Public Open Space" have been used. In the absence of site specific pH and CEC data for the soils, NEPM (1999) EILs have also been adopted where applicable.

In addition, the background ranges for contaminants in Australian soils outlined in the 1999 NEPM have been considered.

With regards to the HSLs, ESLs and management limits, criteria applicable for clay soils have been used, since materials encountered at the site was predominantly silty clays. The criteria adopted for this investigation are outlined in Table 12.1 below.

Table 12.1 – Site soil assessment criteria (inorganics)

Contaminant	NEPM 1999 Background Ranges [6]	NEPM 2013 HIL D [1] /HSL (Commercial/Industrial) [2]	NEPM 2013 EIL/ ESL (Urban Residential & Public Open Space) [3]
Arsenic	1-50	3 000	100 (e)
Cadmium	1	900	3 (f)
Chromium	5-1000	3 600 (b)	400 (f), (j)
Copper	2-100	240 000	100 (f)
Lead	2-200	1 500	1100 (e)
Manganese	850	60 000	500 (f)
Mercury	0.03 (c)	730 (c)	1 (c), (f)
Nickel	5-500	6 000	60 (f)
Zinc	10-300	400 000	200 (f)
Bonded asbestos		0.01% (w/w) (k)	
Friable Asbestos		0.001% (w/w) (k	
Asbestos fibres		No detectable (k)	

Table 12.1 – Site soil assessment criteria (organics)

Contaminant	NEPM 1999 Background Ranges [6]	NEPM 2013 HIL D [1] /HSL (Commercial/ Industrial) [2]	NEPM 2013 EIL/ ESL (Urban Residential & Public Open Space) [3]	CRC CARE 2011 HIL-D Direct Soil Contact [4]	NEPM 2013 Management. Limits (Urban Residential & Public Open Space) [5)
TPH (C_6-C_{10})				5 100	
TPH (C_{10}-C_{16})				3800	
F1 TPH (C_6-C_{10}) (g)		45 (d)	180 (i)		800 (l)
F2 TPH (C_{10}-C_{16}) (h)		110 (d)	120 (i)		1000 (l)
F3 TPH (C_{16}-C_{34})			1 300 (i)	27 000	3 500 (l)
F4 TPH (C_{34}-C_{40})			5 600 (i)	38 000	10 000 (l)
Benzene	0.05-1 (a)	4 (d)	65 (i)	1 100	
Toluene	0.1-1 (a)	NL	105(i)	99 000	
Ethylbenzene		NL	125 (i)	85 000	
Xylenes		NL	45 (i)	130 000	
Naphthalene		NL	170 (e)	29 000	
Benzo(a)pyrene			0.7 (i)		
Carcinogenic PAHs		40			
Total PAHs	0.95-5 (a)	4000			
Aldrin + Dieldrin		45			
Chlordane		530			
DDT+DDD+ DDE		3 600	180 (e), (m)		
Heptachlor		50			
Phenols	0.03-0.5 (a)	240 000			
PCBs	0.02-0.1 (a)	7			

Notes: *All criteria in mg/kg concentrations unless otherwise specified*

(1) *NEPM (2013) – Schedule B1 – HILs for Soil Contaminants – Commercial/Industrial D - Table 1A (1).*

(2) *NEPM (2013) – Schedule B1 – HSLs for Vapour Intrusion – HSL D Commercial/Industrial -Table 1A (3.)*

(3) *NEPM (2013) – Schedule B1 – Soil EILs and ESLs – Urban Residential and Public Open Space – Tables 1B (5) and 1B (6).*

(4) *CRC CARE (2011) – Technical Report No. 10 – Soil HSLs for Direct Contact – HSL D Commercial/Industrial – Table B4.*

(5) *NEPM (2013) – Schedule B1 – Management Limits for TPH Fractions F1-F4 in Soil – Table 1B (7).*

(6) *NEPM (1999) – Schedule B1 – Soil Investigation Levels – Background Ranges - Table 5-A.*

(a) *ANZECC 1992 background ranges used where no NEPM criteria available.*

(b) *Criterion for chromium VI.*

(c) *Criterion for inorganic mercury.*

(d) *NEPM 2013 HSL criterion for vapour intrusion, 0-1m depth in clay soils.*

(e) *2013 NEPM generic EIL.*

(f) *NEPM 1999 EIL used where no NEPM 2013 criteria are available.*

(g) *F1 TPH = TPH (C6-C10) minus BTEX fraction.*

(h *F2 TPH = TPH (C_{10}-C_{16}) minus naphthalene fraction.*

(i) *NEPM 2013 ESL criterion for fine textured soils.*

(j) *Criterion for chromium III.*

(k) *2009 WA DOH/NEPM 2013 thresholds for asbestos in soil, residential land use setting (NEPM 2013 - Schedule B1 - Table 7).*

(l) *NEPM 2013 NEPM management limit criterion for coarse texture grade soils*

(m) *Criterion for DDT*

NL Contaminant is not considered to pose a risk to human health through vapour inhalation regardless the concentration.

13. ANALYTICAL RESULTS AND INTERPRETATION

The analytical results for the soil samples are presented in the laboratory reports included in Appendix G. The results were compared with the adopted assessment criteria defined in section 12.3 above. A summary is presented in Table A of this report.

13.1 Human-Health Risks

The analytical results show that the concentrations of organic and inorganic chemical contaminants in all samples tested are low and well below the NEPM (2013) HIL-D and HSL-Commercial/industrial criteria. All results are also below the CRC Care HSL-D criteria. Further, no asbestos fibres were detected.

These results indicate that the concentrations of chemical contaminants measured in the soil samples are below criteria that are protective of human-health for a commercial/industrial land use setting.

13.2 Environmental Risks

The concentrations of organic and inorganic contaminants measured in soil samples are also below the NEPM (2013) EIL/ESL criteria for an “urban residential setting and public space” and the NEPM (2013) management limits. Therefore, the contaminant concentrations measured in the soil samples do not present an unacceptable risk to plant health and the environment in general.

13.3 Risk of Groundwater Impacts

In view of the very low concentrations of chemical contaminants detected in the soils at the site and an assumed deep groundwater table, the site in not likely to have contributed to unacceptable groundwater impacts.

13.4 Potential for Off-Site Migration of Contamination

Low levels of contaminants were detected in the soil samples analysed. The contaminants are present at levels comparable to the lower bounds of background concentration ranges. Therefore, even if offsite migration, for instance, via surface runoff or wind action have occurred, unfavourable impacts to off-site receptors are unlikely.

13.5 Duty to Report Site Contamination

Under the provisions of the *Contaminated Land Management Act 1997* (CLM Act), a site owner or occupant has a duty to notify the EPA of any significant contamination that has the potential to cause human-health or environmental harm. The requirements for reporting contamination are set out in the EPA's "*Guidelines on the Duty to Report Contamination Under the Contaminated Land Management Act 1997"*, (2015). The guidelines describe the conditions which trigger notification regarding the contamination of soil, groundwater and soil vapour.

The notification thresholds for soils are the HILs and soil-based HSLs, which are outlined in Schedule B1 of the *National Environment Protection Measure (NEPM)*, 1999 & 2013. Where contaminants in the soils on a site exceed HIL criteria by more than 2.5 times in any one sample or where the average concentrations (i.e. 95% upper confidence limits of the arithmetic mean of the contaminant concentrations) of contaminants in soil exceed the applicable HILs, **and** where persons may have been, or foreseeably will be exposed to the contamination, EPA must be notified.

The Duty to Report Guidelines also applies to asbestos contamination in soil that are provided in NEPM. The guidelines recommend reporting the presence of friable asbestos of anthropogenic sources if present at a weight-based percentage exceeding 0.001%. In addition, EPA must also be notified for source sites responsible for the specified contamination to be realised on adjacent lands. The Duty to Report Guidelines does not define notification thresholds for all contaminants. EPA recommends reliance on advice provided by an environmental consultant for contaminants with no specified criteria.

The results of the soil sampling performed for this investigation show that the concentrations of chemical contaminants measured in the soils on the site are low. No exceedance of adopted NEPM (2013) HIL/HSL criteria occurred. Therefore, based on currently available data there is no need to notify NSW EPA.

13.6 Assessment Outcomes

Based on the results of this investigation, the site does not present an unacceptable risk to human-health or the environment.

14. EVALUATION OF QUALITY ASSURANCE

14.1 Field Duplicate and Triplicate Sample Results

The results of the field intra-laboratory and inter-laboratory duplicate sample analyses are compared to those of the corresponding primary sample in Table B. The results show that for all the analytes, only the Relative Percentage Difference (RPD) for nickel exceeds the allowable criteria. The nickel concentration in the primary sample is smaller than background level and only 5mg/kg higher than the same level in the corresponding duplicate sample. Therefore, we consider this discripinancy to be insignificant and the data are thus reliable to represent the current contamination condition at the site. The same observation and conclusion applies to the RPDs calculated based on analyte concentration detected in the triplicate samples.

14.2 Laboratory Quality Control Program

Our review of the laboratory's internal QC program has shown that the all laboratory blanks, internal duplicate samples, laboratory control samples, matrix spike recoveries, and surrogate recovery standards were generally within the analytical laboratories' recommended range for acceptable reproducibility. Therefore, STS GeoEnvironmental considers the laboratory data obtained in the sampling program to be of acceptable precision, accuracy and reliability and representative of the site conditions encountered.

14.3 Procedure-Based Quality Control

An appraisal of the key procedure-based quality control aspects of the investigation are summarized in Table 14.1 below.

TABLE 14.1 APPRAISAL OF PROCEDURE-BASED QUALITY CONTROL

Item	Compliance	Reference/Comments
Appropriate sampling methods adopted?	Yes	Refer to Section 10
Appropriate sample handling and transportation procedures implemented?	Yes	Refer to Section 10 and COC documentation in Appendix F
Samples analysed within recommended laboratory holding times?	Yes	Refer to COC documentation in Appendix F and laboratory reports in Appendix G
NATA-accredited laboratory testing methods used?	Yes	Refer to laboratory reports in Appendix G

15. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this investigation the following conclusions and recommendations are made:

Based on the results of this preliminary site investigation the following conclusions and recommendations are made:

- the assessment indicates that activities associated with former and current land use at the site and immediate surrounding to be low.
- All measured contaminant concentrations are low and below the NEPM human health and environmental criteria. Further, no asbestos fibres were detected.
- the site is not likely to contain sources of contaminants which would adversely impact groundwater or other offsite receptors.
- there is low potential for contaminants presently located at the site which would adversely affect the proposed development and the site is considered suitable for the proposed commercial/industrial use.
- if during development, potentially contaminated soil is encountered, a contaminated land consultant needs to be contacted.

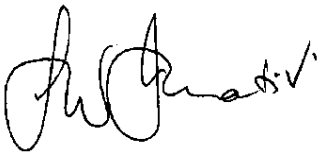
16. LIMITATIONS

STS GeoEnvironmental Pty Ltd has performed its services for this project in accordance with its current professional standards. Laboratory analyses were undertaken as part of this investigation by ALS Environmental in Sydney and in Brisbane, who are NATA-accredited for the analyses performed.

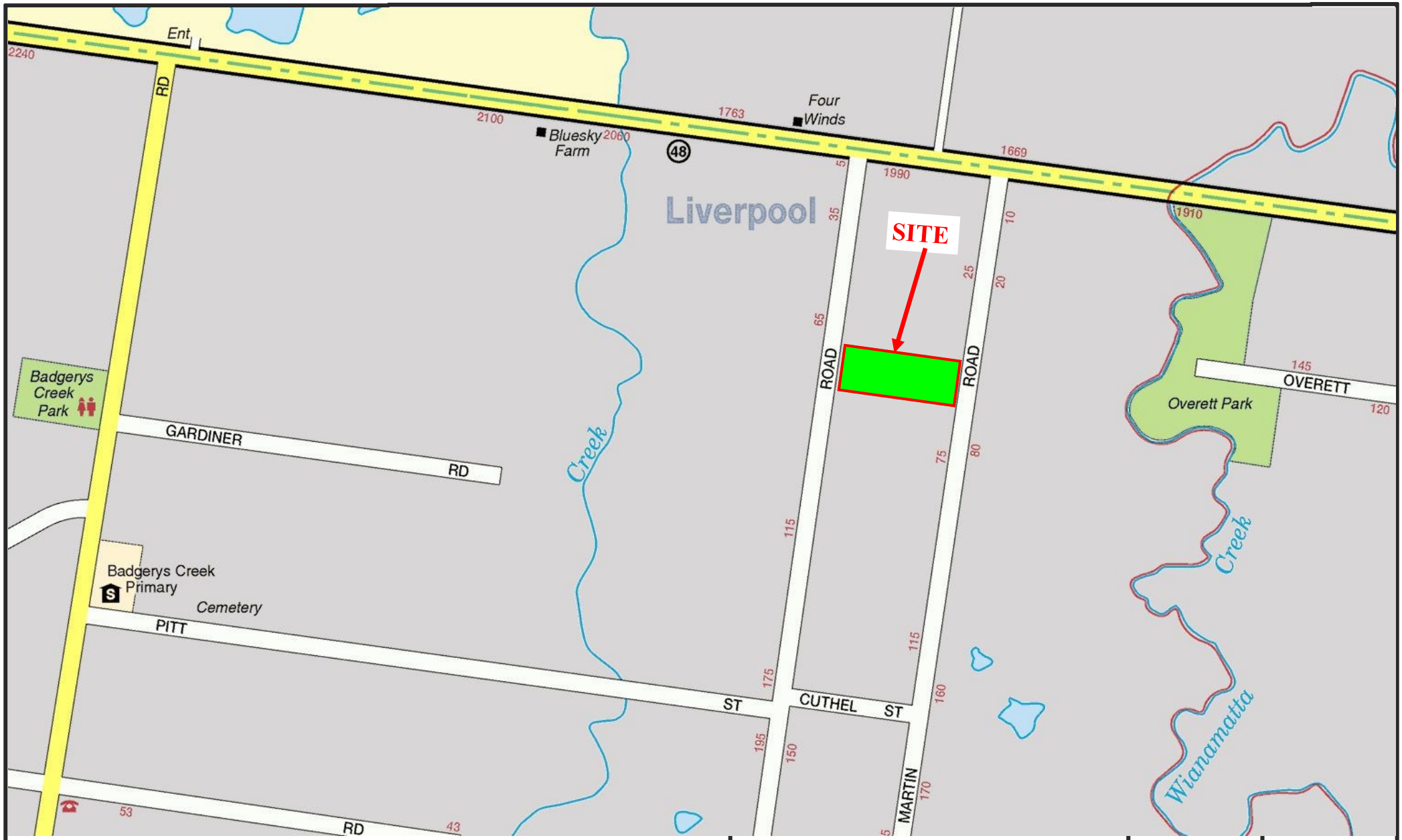
When assessing the extent of contamination across a site from a soil sampling program there is the possibility that variations may occur between sample locations and the actual presence of contaminated material at the site may differ from that referred to herein, since no sampling program, no matter how comprehensive, can reveal all anomalies and hot spots that may be present.

The data collected has been used to form an opinion about land contamination regarding the proposed use of the site, that being as a commercial/industrial use. If the nature of the proposed land use changes, the conclusions given in this report may need to be revised. Also, regulatory evaluation criteria are constantly changing and therefore, concentrations of contaminants presently considered low may, in the future, fall under different regulatory standards that may alter the outcome of this investigation. Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

This document and the information herein have been prepared solely for the use of AMJ Demolition & Excavation Pty Ltd for the purposes nominated in this report. No person or organization other than of AMJ Demolition & Excavation Pty Ltd are entitled to rely on any part of the report without the prior written consent of STS GeoEnvironmental Pty Ltd. Any third party relying on this report shall have no legal recourse against STS GeoEnvironmental Pty Ltd or its parent organizations or subsidiaries and shall indemnify and defend them from all and against all claims arising out of, or in conjunction with such use or reliance.

Report Written By:	Report Reviewed By:
	
J A. Pierre, MEngSc, GradCert Environmental Engineer	Laurie Ihnativ, BE, MEngSc, MBA Principal Geotechnical Engineer

FIGURES



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CLIENT: AMJ DEMOLITION AND EXCAVATION	Drawn by: JAP — Reviewed by:	
LIMITED SITE INVESTIGATION **55, MARTIN ROAD, BADGERYS CREEK, NSW SITE LOCATION** **SITE LOCATION**	Project No. 21649/8652C	
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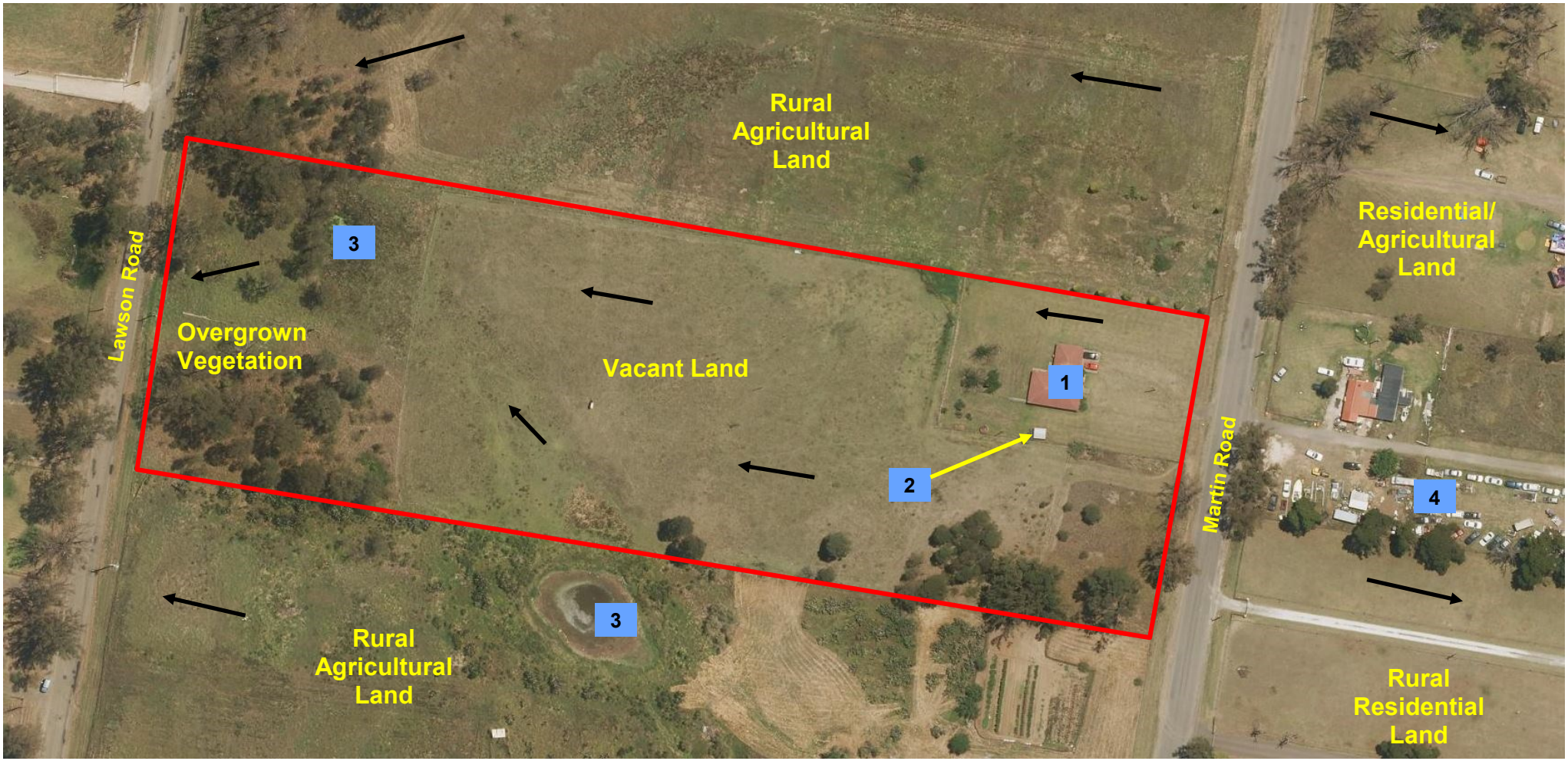

1	One Storey Brick Residence	2	Metal Shed	3	Farm Dam	4	Junkyard

LEGEND

- Site Boundary
- 1 Site Features
- Slope

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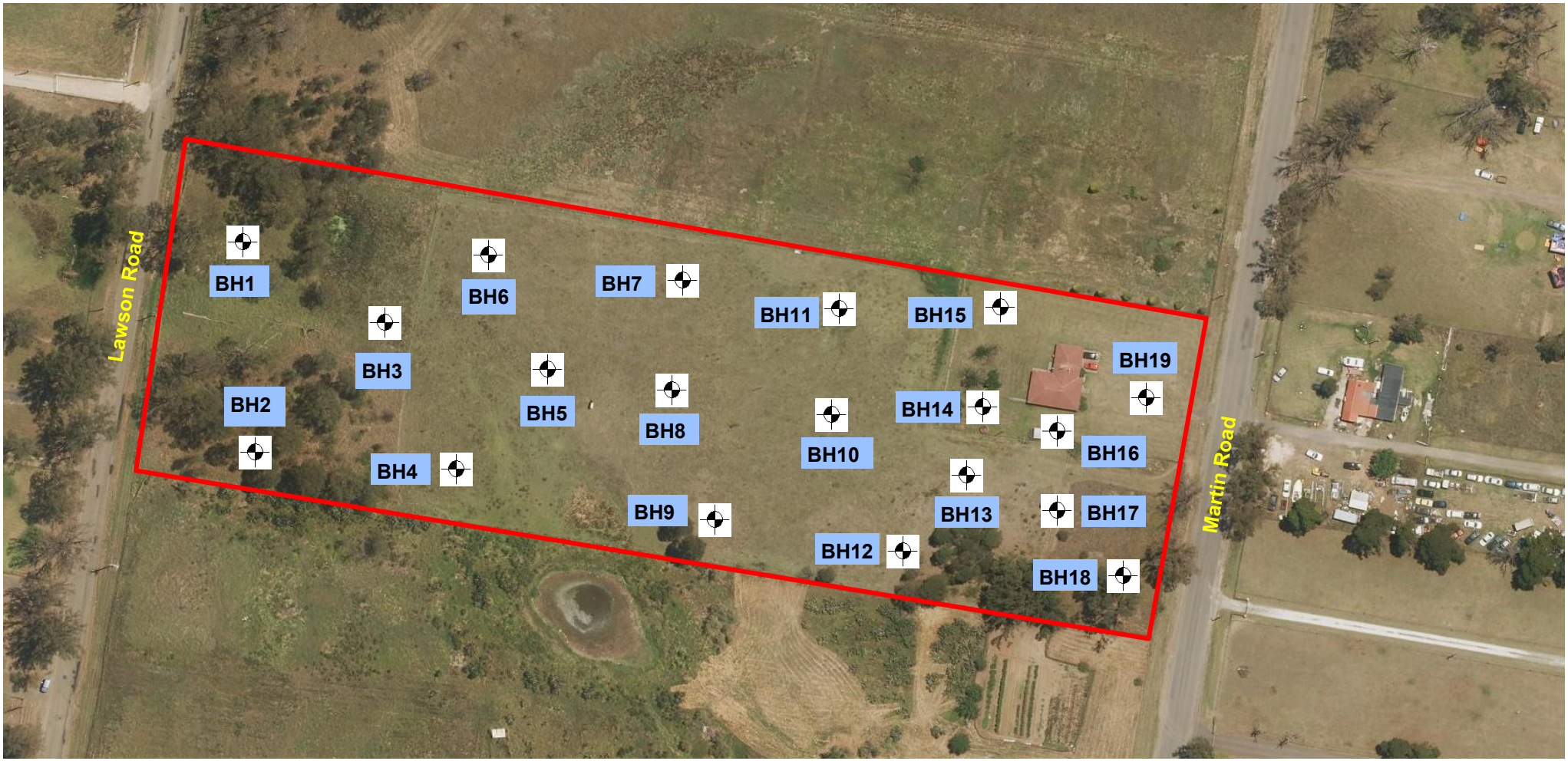
STS GEOENVIRONMENTAL PTY LTD	Scale: 1:1300(at A4)	Date: January 2018
CLIENT: AMJ DEMOLITION AND EXCAVATION	Drawn by: JAP — Reviewed by:	
LIMITED SITE INVESTIGATION 55, MARTIN ROAD, BADGERYS CREEK, NSW SITE LOCATION SITE FEATURES AND VICINNITY	Project No. 21649/8652C	
	Drawing No: 18/0089/2	

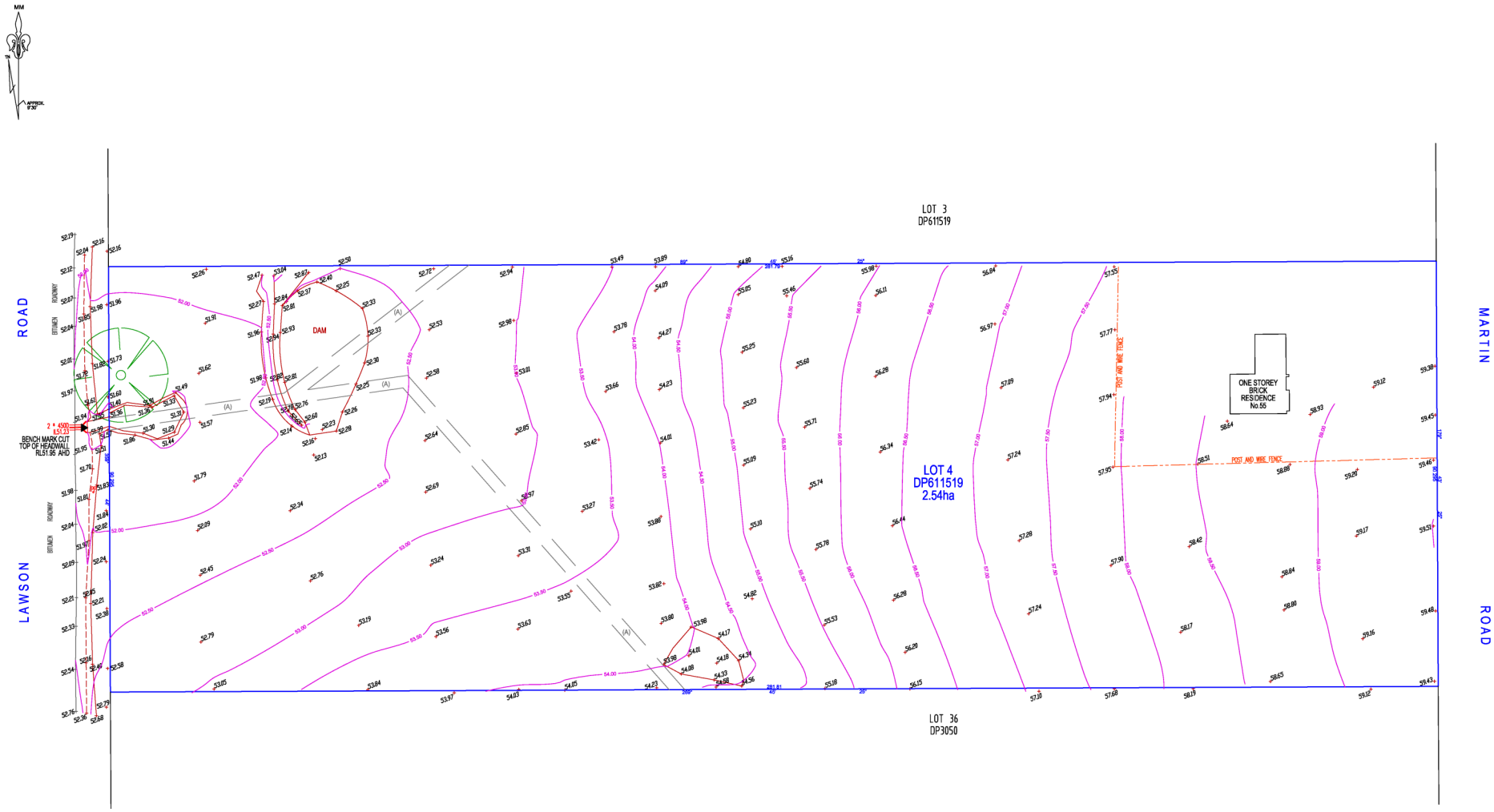


LEGEND

- Site Boundary
- Borehole Locations
- BH1 — Borehole Number
- Slope

STS GEOENVIRONMENTAL PTY LTD

STS GEOENVIRONMENTAL PTY LTD	Scale: 1:1300(at A4)	Date: January 2018
CLIENT: AMJ DEMOLITION AND EXCAVATION	Drawn by: JAP — Reviewed by:	
LIMITED SITE INVESTIGATION 55, MARTIN ROAD, BADGERYS CREEK, NSW SITE LOCATION BOREHOLES (SAMPLING) LOCATIONS	Project No. 21649/8652C	Drawing No: 18/0089/3



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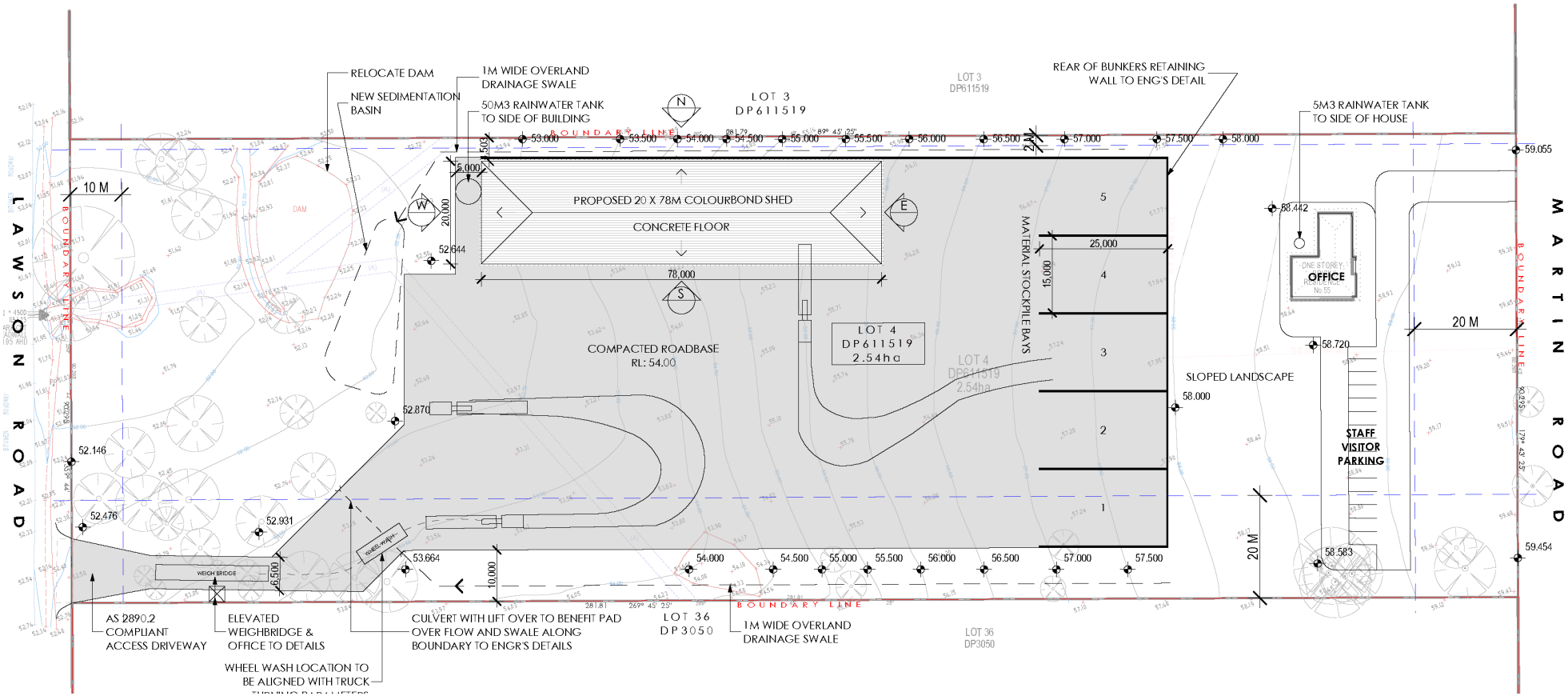
CLIENT: AMJ DEMOLITION AND EXCAVATION	Drawn by: JAP — Reviewed by:	
LIMITED SITE INVESTIGATION **55, MARTIN ROAD, BADGERYS CREEK, NSW SITE LOCATION** **EXISTING SITE PLAN**	Project No. 21649/8652C	
	Drawing No: 18/0089/4 :	

STS GEOENVIRONMENTAL PTY LTD



GEOENVIRONMENTAL PTY LTD

STS GEOENVIRONMENTAL PTY LTD	Scale:1:14400 (at A4)	Date: January 2018
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	Drawing No: 18/0089/5	

TABLES OF RESULTS

Table A Analytical Results for Primary Soil Samples

Analytes	Borehole No.	BH1	BH2	BH2	BH3	BH3	BH4	BH4	BH4	BH4	BH6	BH6	NEPM 1999 Background Ranges	NEPM 2013 HIL D/ HSL D (Commercial/Industrial)	NEPM 2013 EIL/ ESL (Urban Residential & Public Open Space)	CRC CARE 2011 HSL-A Direct Soil Contact	NEPM 2013 Management Limits (Residential, Parkland & Public Open Space)
	Sample No.	S1/1-1	S2-1	S2-2	S3/1-1	S3/2-1	S4/1-1	S4/2-1	S4/5-1	S4/6-1	S6/1-1	S6/2-1					
	Sample Depth	0.2	0.2	0.5	0.2	0.8	0.2	0.7	2.1	3	0.2	0.6					
	Type of Soil	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural					
	Sample Date	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17					
Metals																	
Arsenic		<5	--	12	5	<5	10	10	<5	7	7	10	1-50	3 000	100 (e)		
Cadmium		<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	900	3 (f)		
Chromium		8	--	26	16	13	19	18	13	12	19	16	5-1000	3 600 (b)	400 (f),(g)		
Copper		11	--	15	28	33	14	16	36	31	25	44	2-100	240 000	100 (f)		
Lead		16	--	13	19	19	19	9	14	13	18	17	2-200	1 500	1100 (e)		
Manganese		--	--	--	--	--	--	--	--	--	--	--	850	60 000	500 (f)		
Mercury		<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03 (c)	730 (c)	1 (c),(f)		
Nickel		5	--	3	9	14	8	4	22	21	17	18	5-500	6 000	60 (f)		
Zinc		18	--	7	22	40	32	7	65	47	38	50	10-300	400 000	200 (f)		
Monocyclic Aromatic Hydrocarbons (MAHs)																	
Benzene		--	--	--	--	--	--	--	--	--	--	--	0.05-1 (a)	4 (d)	50 (h)	100	
Toluene		--	--	--	--	--	--	--	--	--	--	--	0.1-1 (a)	NL (d)	85 (h)	14000	
Ethylbenzene		--	--	--	--	--	--	--	--	--	--	--		NL (d)	70 (h)	4500	
Xylenes		--	--	--	--	--	--	--	--	--	--	--		NL (d)	105 (h)	12000	
Napthalene		--	--	--	--	--	--	--	--	--	--	--		NL (d)	170 (e)	1400	
Total MAHs above detection limits		--	--	--	--	--	--	--	--	--	--	--					
Total Petroleum Hydrocarbons (TPHs)																	
Total C_6-C_{10}		--	--	--	--	--	--	--	--	--	--	--				4400	
Total C_{10}-C_{16}		--	--	--	--	--	--	--	--	--	--	--				3300	
F1 C_6-C_{10}[1] (l)		--	--	--	--	--	--	--	--	--	--	--		310 (d)	180 (h)		700 (j)
F2 C_{10}-C_{16}[1] (m)		--	--	--	--	--	--	--	--	--	--	--		NL (d)	120 (h)		1000 (j)
F3 >C_{16}-C_{34}		--	--	--	--	--	--	--	--	--	--	--			300 (h)	4500	2500 (j)
F4 >C_{34}-C_{40}		--	--	--	--	--	--	--	--	--	--	--			2800 (h)	6300	10000 (j)
Total C_{10}-C_{36}		--	--	--	--	--	--	--	--	--	--	--					
Polycyclic Aromatic Hydrocarbons (PAHs)			--	--	--	--	--	--	--	--	--	--					
Benzo(a)pyrene (as BaP TEQ)		--	--	--	--	--	--	--	--	--	--	--			0.7 (h)		
Carcinogenic PAHs[2]		--	--	--	--	--	--	--	--	--	--	--		40			
Total PAHs above detection limits		--	--	--	--	--	--	--	--	--	--	--	0.95-5 (a)	4 000			
Organochlorine Pesticides (OCPs)			--	--	--	--	--	--	--	--	--	--					
Aldrin + Dieldrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	<0.05	--		45			
Chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	<0.05	--		530			
DDT+DDD+ DDE		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	<0.05	--		3 600	180 (e),(i)		
Heptachlor		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	<0.05	--		50			
Total OCPs above detection limits		ND	ND	ND	ND	ND	ND		ND	ND	ND	--					
Organophosphorus Pesticides (OPPs)																	
Total OPPs above detection limits		ND	ND	ND	ND	ND	ND		ND	ND	ND	--					
Phenolic Compounds																	
Total Phenols above detection lim		--	--	--	--	--	--	--	--	--	--	--	0.03-0.5 (a)	240 000			
Polychlorinated Biphenyls (PCBs)																	
Total PCBs above detection limits		--	--	--	--	--	--	--	--	--	--	--	0.02-0.1 (a)	7			
Asbestos																	
Free Fibres		ND	ND	--	ND	--	--	--	ND	ND	--	--		No detectable (k)			
Friable Asbestos (% w/w)		<0.001	<0.001	--	<0.001	--	--	--	<0.001	<0.001	--	--		0.001% (k)			
Bonded Asbestos (% w/w)		<0.01	<0.01	--	<0.01	--	--	--	<0.01	<0.01	--	--		0.01% (k)			

Notes : Results expressed as mg/kg unless otherwise indicated
NA = Not applicable
ND = No individual species detected abovelaboratory detection limits.
[1] Calculated in accordance with Table 1A(3) of NEPM 2013
[2] Combined carcinogenic PAHs with relative potency to benzo(a)pyrene

(a) ANZECC 1992 background ranges used where no NEPM criteria available.
(b) Criterion for chromium VI.
(c) Criterion for inorganic mercury.
(d) NEPM 2013 HSL criterion for vapour intrusion, 0-1m depth in sandy soils.
(e) 2013 NEPM generic EIL.
(f) NEPM 1999 EIL used where no NEPM 2013 criteria are available.
(g) Criterion for chromium III
(h) NEPM ESL criterion for coarse texture grade soils.
(i) Criterion for DDT
(j) Criterion for coarse texture grade soils
(k) 2013 NEPM/WA DOH criteria for asbestos fibres in soil.
(l) F1 TPH = TPH (C6-C10) minus BTEX fraction.
(m) F2 TPH = TPH (C10-C16) minus naphthalene fraction.

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Table A Analytical Results for Primary Soil Samples

Analytes	Borehole No.	BH7	BH7	BH8	BH8	BH9	BH10	BH11	BH12	BH14	BH14	BH15	BH16	NEPM 1999 Background Ranges	NEPM 2013 HIL D/ HSL D (Commercial/Industrial)	NEPM 2013 EIL/ ESL (Urban Residential & Public Open Space)	CRC CARE 2011 HSL-A Direct Soil Contact	NEPM 2013 Management Limits (Residential, Parkland & Public Open Space)
	Sample No.	S7/1-1	S7/2-1	S8-1	S8-2	S9-1	S10-1	S11-1	S12/1-1	S14/1-1	S14/1-2	S15-1	S16-1					
	Sample Depth	0.2	0.7	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.2					
	Type of Soil	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural	Natural					
	Sample Date	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17	18-Jan-17					
Metals																		
Arsenic		8	<5	10	11	--	--	9	8	16	15	12	16	1-50	3 000	100 (e)		
Cadmium		<1	<1	<1	<1	--	--	<1	<1	<1	<1	<1	<1	1	900	3 (f)		
Chromium		16	11	14	18	--	--	13	23	24	19	18	26	5-1000	3 600 (b)	400 (f),(g)		
Copper		15	24	13	14	--	--	16	13	26	31	21	15	2-100	240 000	100 (f)		
Lead		14	14	17	15	--	--	24	21	41	20	68	28	2-200	1 500	1100 (e)		
Manganese		--	--	--	--	--	--	--	--	--	--	--	--	850	60 000	500 (f)		
Mercury		<0.1	<0.1	<0.1	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03 (c)	730 (c)	1 (c),(f)		
Nickel		17	11	7	8	--	--	6	7	12	52	14	8	5-500	6 000	60 (f)		
Zinc		38	29	22	18	--	--	39	37	110	124	55	40	10-300	400 000	200 (f)		
Monocyclic Aromatic Hydrocarbons (MAHs)																		
Benzene		--	--	--	--	--	--	--	--	--	--	--	<0.2	0.05-1 (a)	4 (d)	50 (h)	100	
Toluene		--	--	--	--	--	--	--	--	--	--	--	<0.5	0.1-1 (a)	NL (d)	85 (h)	14000	
Ethylbenzene		--	--	--	--	--	--	--	--	--	--	--	<0.5		NL (d)	70 (h)	4500	
Xylenes		--	--	--	--	--	--	--	--	--	--	--	<0.5		NL (d)	105 (h)	12000	
Napthalene		--	--	--	--	--	--	--	--	--	--	--	<1		NL (d)	170 (e)	1400	
Total MAHs above detectic		--	--	--	--	--	--	--	--	--	--	--	ND					
Total Petroleum Hydrocarbons (TPHs)																		
Total C_6-C_{10}		--	--	--	--	--	--	--	--	--	--	--	<10				4400	
Total C_{10}-C_{16}		--	--	--	--	--	--	--	--	--	--	--	<50				3300	
F1 C_6-C_{10} [1] (l)		--	--	--	--	--	--	--	--	--	--	--	<10		310 (d)	180 (h)		700 (j)
F2 C_{10}-C_{16} (m)		--	--	--	--	--	--	--	--	--	--	--	<50		NL (d)	120 (h)		1000 (j)
F3 >C_{16}-C_{34}		--	--	--	--	--	--	--	--	--	--	--	<100			300 (h)	4500	2500 (j)
F4 >C_{34}-C_{40}		--	--	--	--	--	--	--	--	--	--	--	<100			2800 (h)	6300	10000 (j)
Total C_{10}-C_{36}		--	--	--	--	--	--	--	--	--	--	--	<50					
Polycyclic Aromatic Hydrocarbons (PAHs)																		
Benzo(a)pyrene (as BaP T		--	--	--	--	--	--	--	--	--	--	--	<0.5			0.7 (h)		
Carcinogenic PAHs [2]		--	--	--	--	--	--	--	--	--	--	--	<0.5		40			
Total PAHs above detectio		ND	--	--	--	--	--	--	--	--	--	--	ND	0.95-5 (a)	4 000			
Organochlorine Pesticides (OCPs)																		
Aldrin + Dieldrin		<0.05	<0.05	<0.05	--	<0.05	<0.05	--	--	--	--	--	<0.05		45			
Chlordane		<0.05	<0.05	<0.05	--	<0.05	<0.05	--	--	--	--	--	<0.05		530			
DDT+DDD+ DDE		<0.05	<0.05	<0.05	--	<0.05	<0.05	--	--	--	--	--	<0.05		3 600	180 (e),(i)		
Heptachlor		<0.05	<0.05	<0.05	--	<0.05	<0.05	--	--	--	--	--	<0.05		50			
Total OCPs above detectic		ND	ND	ND	--	ND	ND	--	--	--	--	--	ND					
Organophosphorus Pesticides (OPPs)																		
Total OPPs above detectio		ND	ND	ND	--	ND	ND	ND	--	ND	--	--	ND					
Phenolic Compounds																		
Total Phenols above detec		--	--	--	--	--	--	ND	--	ND	--	--	ND	0.03-0.5 (a)	240 000			
Polychlorinated Biphenyls (PCBs)																		
Total PCBs above detectio		--	--	--	--	--	--	<0.1	--	<0.1	--	--	<0.1	0.02-0.1 (a)	7			
Asbestos																		
Type																		
Free Fibres		ND	--	ND	--	--	--	ND	--	ND	--	ND	ND		No detectable (k)			
Friable Asbestos (% w/w)		<0.001	--	<0.001	--	--	--	<0.001	--	<0.001	--	<0.001	<0.001		0.001% (k)			
Bonded Asbestos (% w/w)		<0.01	--	<0.01	--	--	--	<0.01	--	<0.01	--	<0.01	<0.01		0.01% (k)			

Notes : Results expressed as mg/kg unless otherwise indicated
NA = Not applicable
ND = No individual species detected abovelaboratory detection limits.
[1] Calculated in accordance with Table 1A(3) of NEPM 2013
[2] Combined carcinogenic PAHs with relative potency to benzo(a)pyrene

(a) ANZECC 1992 background ranges used where no NEPM criteria available.
(b) Criterion for chromium VI.
(c) Criterion for inorganic mercury.
(d) NEPM 2013 HSL criterion for vapour intrusion, 0-1m depth in sandy soils.
(e) 2013 NEPM generic EIL.
(f) NEPM 1999 EIL used where no NEPM 2013 criteria are available.
(g) Criterion for chromium III
(h) NEPM ESL criterion for coarse texture grade soils.
(i) Criterion for DDT
(j) Criterion for coarse texture grade soils
(k) 2013 NEPM/WA DOH criteria for asbestos fibres in soil.
(l) F1 TPH = TPH (C6-C10) minus BTEX fraction.
(m) F2 TPH = TPH (C10-C16) minus naphthalene fraction.

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Table A Analytical Results for Primary Soil Samples

Analytes	Borehole No. / Sample No. / Sample Depth / Type of Soil / Sample Date	NEPM 1999 Background Ranges	NEPM 2013 HIL D/ HSL D (Commercial/Industrial)	NEPM 2013 EIL/ ESL (Urban Residential & Public Open Space)	CRC CARE 2011 HSL-A Direct Soil Contact	CRC CARE 2011 HSL-B Direct Soil Contact	NEPM 2013 Management Limits (Residential, Parkland & Public Open Space)
	BH18 / S18-1 / 0.2 / Natural / 18-Jan-17						
Metals							
Arsenic	11	1-50	3 000	100 (e)			
Cadmium	<1	1	900	3 (f)			
Chromium	28	5-1000	3 600 (b)	400 (f),(g)			
Copper	15	2-100	240 000	100 (f)			
Lead	26	2-200	1 500	1100 (e)			
Manganese	--	850	60 000	500 (f)			
Mercury	<0.1	0.03 (c)	730 (c)	1 (c),(f)			
Nickel	7	5-500	6 000	60 (f)			
Zinc	38	10-300	400 000	200 (f)			
Monocyclic Aromatic Hydrocarbons (MAHs)							
Benzene	--	0.05-1 (a)	4 (d)	50 (h)	100	140	
Toluene	--	0.1-1 (a)	NL (d)	85 (h)	14000	21000	
Ethylbenzene	--		NL (d)	70 (h)	4500	5900	
Xylenes	--		NL (d)	105 (h)	12000	17000	
Napthalene	--		NL (d)	170 (e)	1400	2200	
Total MAHs above detection limits	--						
Total Petroleum Hydrocarbons (TPHs)							
Total C_6-C_{10}	--				4400	5600	
Total C_{10}-C_{16}	--				3300	4200	
F1 C_6-C_{10}[1] (l)	--		310 (d)	180 (h)			700 (j)
F2 C_{10}-C_{16}[1] (m)	--		NL (d)	120 (h)			1000 (j)
F3 >C_{16}-C_{34}	--			300 (h)	4500	5800	2500 (j)
F4 >C_{34}-C_{40}	--			2800 (h)	6300	8100	10000 (j)
Total C_{10}-C_{36}	--						
Polycyclic Aromatic Hydrocarbons (PAHs)							
Benzo(a)pyrene (as BaP TEQ)	--			0.7 (h)			
Carcinogenic PAHs[2]	--		40				
Total PAHs above detection limits	ND	0.95-5 (a)	4 000				
Organochlorine Pesticides (OCPs)							
Aldrin + Dieldrin	<0.05		45				
Chlordane	<0.05		530				
DDT+DDD+ DDE	<0.05		3 600	180 (e),(i)			
Heptachlor	<0.05		50				
Total OCPs above detection limits	ND						
Organophosphorus Pesticides (OPPs)							
Total OPPs above detection limits	ND						
Phenolic Compounds							
Total Phenols above detection limits	--	0.03-0.5 (a)	240 000				
Polychlorinated Biphenyls (PCBs)							
Total PCBs above detection limits	--	0.02-0.1 (a)	7				
Asbestos							
Type							
Free Fibres	ND		No detectable (k)				
Friable Asbestos (% w/w)	<0.001		0.001% (k)				
Bonded Asbestos (% w/w)	<0.01		0.01% (k)				

Notes : Results expressed as mg/kg unless otherwise indicated
NA = Not applicable
ND = No individual species detected abovelaboratory detection limits.
[1] Calculated in accordance with Table 1A(3) of NEPM 2013
[2] Combined carcinogenic PAHs with relative potency to benzo(a)pyrene

(a) ANZECC 1992 background ranges used where no NEPM criteria available.
(b) Criterion for chromium VI.
(c) Criterion for inorganic mercury.
(d) NEPM 2013 HSL criterion for vapour intrusion, 0-1m depth in sandy soils.
(e) 2013 NEPM generic EIL.
(f) NEPM 1999 EIL used where no NEPM 2013 criteria are available.
(g) Criterion for chromium III
(h) NEPM ESL criterion for coarse texture grade soils.
(i) Criterion for DDT
(j) Criterion for coarse texture grade soils
(k) 2013 NEPM/WA DOH criteria for asbestos fibres in soil.
(l) F1 TPH = TPH (C6-C10) minus BTEX fraction.
(m) F2 TPH = TPH (C10-C16) minus naphthalene fraction.
(n) 2013 NEPM generic EIL for DDT.

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Table B Results of Quality Control - Intra and Inter Laboratory Duplicate Samples

Analyte	Sample Numbers								
	S2-1	Dup1	RPD (%)	S8-1	Dup2	RPD (%)	S11-1	Dup3	RPD (%)
Metals									
Arsenic	--	--	--	10	10	0	9	13	36
Cadmium	--	--	--	<1	<1	<50	<1	<1	<50
Chromium	--	--	--	14	21	40	13	20	42
Copper	--	--	--	13	18	32	16	18	12
Lead	--	--	--	17	20	16	24	18	29
Manganese	--	--	--	--	--	--	--	--	--
Mercury	--	--	--	<0.1	<0.1	<50	<0.1	<0.1	<50
Nickel	--	--	--	2	10	133	6	9	40
Zinc	--	--	--	22	43	65	39	44	12
Organochlorine Pesticides (OCPs)									
alpha-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Hexachlorobenzene (HCB)	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
beta-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
gamma-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
delta-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Heptachlor	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Aldrin	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Heptachlor epoxide	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Total Chlordane (sum)	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
trans-Chlordane	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
alpha-Endosulfan	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
cis-Chlordane	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Dieldrin	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
4.4`-DDE	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Endrin	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Endosulfan (sum)	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
beta-Endosulfan	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
4.4`-DDD	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Endrin aldehyde	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Endosulfan sulfate	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
4.4`-DDT	<0.2	<0.2	<70	<0.2	<0.2	<70	--	--	--
Endrin ketone	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Methoxychlor	<0.2	<0.2	<70	<0.2	<0.2	<70	--	--	--
Sum of DDD + DDE + DDT	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Sum of Aldrin + Dieldrin	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Organophosphorus Pesticides (OP)									
Dichlorvos	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Demeton-S-methyl	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Monocrotophos	<0.2	<0.2	<70	<0.2	<0.2	<70	--	--	--
Dimethoate	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Diazinon	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Chlorpyrifos-methyl	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Parathion-methyl	<0.2	<0.2	<70	<0.2	<0.2	<70	--	--	--
Malathion	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Fenthion	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Chlorpyrifos	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Parathion	<0.2	<0.2	<70	<0.2	<0.2	<70	--	--	--
Pirimphos-ethyl	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Chlorfenvinphos	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Bromophos-ethyl	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Fenamiphos	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Prothiofos	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Ethion	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Carbophenothion	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--
Azinphos Methyl	<0.05	<0.05	<70	<0.05	<0.05	<70	--	--	--

Note: Results expressed as mg/kg dry weight unless otherwise specified.

RPDs that have been shaded exceed the acceptance criteria

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Table B Results of Quality Control - Intra and Inter Laboratory Duplicate Samples

Analyte	Sample Numbers					
	S2-1	Trip1	RPD (%)	S8-1	Trip2	RPD (%)
Metals						
Arsenic	--	--	--	10	11	-10
Cadmium	--	--	--	<1	<1	<50
Chromium	--	--	--	14	17	19
Copper	--	--	--	13	16	21
Lead	--	--	--	17	22	26
Manganese	--	--	--	--	--	--
Mercury	--	--	--	<0.1	<0.1	<50
Nickel	--	--	--	2	10	133
Zinc	--	--	--	22	35	46
Organochlorine Pesticides (OCPs)						
alpha-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70
Hexachlorobenzene (HCB)	<0.05	<0.05	<70	<0.05	<0.05	<70
beta-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70
gamma-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70
delta-BHC	<0.05	<0.05	<70	<0.05	<0.05	<70
Heptachlor	<0.05	<0.05	<70	<0.05	<0.05	<70
Aldrin	<0.05	<0.05	<70	<0.05	<0.05	<70
Heptachlor epoxide	<0.05	<0.05	<70	<0.05	<0.05	<70
Total Chlordane (sum)	<0.05	<0.05	<70	<0.05	<0.05	<70
trans-Chlordane	<0.05	<0.05	<70	<0.05	<0.05	<70
alpha-Endosulfan	<0.05	<0.05	<70	<0.05	<0.05	<70
cis-Chlordane	<0.05	<0.05	<70	<0.05	<0.05	<70
Dieldrin	<0.05	<0.05	<70	<0.05	<0.05	<70
4.4`-DDE	<0.05	<0.05	<70	<0.05	<0.05	<70
Endrin	<0.05	<0.05	<70	<0.05	<0.05	<70
Endosulfan (sum)	<0.05	<0.05	<70	<0.05	<0.05	<70
beta-Endosulfan	<0.05	<0.05	<70	<0.05	<0.05	<70
4.4`-DDD	<0.05	<0.05	<70	<0.05	<0.05	<70
Endrin aldehyde	<0.05	<0.05	<70	<0.05	<0.05	<70
Endosulfan sulfate	<0.05	<0.05	<70	<0.05	<0.05	<70
4.4`-DDT	<0.2	<0.2	<70	<0.2	<0.2	<70
Endrin ketone	<0.05	<0.05	<70	<0.05	<0.05	<70
Methoxychlor	<0.2	<0.2	<70	<0.2	<0.2	<70
Sum of DDD + DDE + DDT	<0.05	<0.05	<70	<0.05	<0.05	<70
Sum of Aldrin + Dieldrin	<0.05	<0.05	<70	<0.05	<0.05	<70
Organophosphorus Pesticides (OP)						
Dichlorvos	<0.05	<0.05	<70	<0.05	<0.05	<70
Demeton-S-methyl	<0.05	<0.05	<70	<0.05	<0.05	<70
Monocrotophos	<0.2	<0.2	<70	<0.2	<0.2	<70
Dimethoate	<0.05	<0.05	<70	<0.05	<0.05	<70
Diazinon	<0.05	<0.05	<70	<0.05	<0.05	<70
Chlorpyrifos-methyl	<0.05	<0.05	<70	<0.05	<0.05	<70
Parathion-methyl	<0.2	<0.2	<70	<0.2	<0.2	<70
Malathion	<0.05	<0.05	<70	<0.05	<0.05	<70
Fenthion	<0.05	<0.05	<70	<0.05	<0.05	<70
Chlorpyrifos	<0.05	<0.05	<70	<0.05	<0.05	<70
Parathion	<0.2	<0.2	<70	<0.2	<0.2	<70
Pirimphos-ethyl	<0.05	<0.05	<70	<0.05	<0.05	<70
Chlorfenvinphos	<0.05	<0.05	<70	<0.05	<0.05	<70
Bromophos-ethyl	<0.05	<0.05	<70	<0.05	<0.05	<70
Fenamiphos	<0.05	<0.05	<70	<0.05	<0.05	<70
Prothiofos	<0.05	<0.05	<70	<0.05	<0.05	<70
Ethion	<0.05	<0.05	<70	<0.05	<0.05	<70
Carbophenothion	<0.05	<0.05	<70	<0.05	<0.05	<70
Azinphos Methyl	<0.05	<0.05	<70	<0.05	<0.05	<70

Note: Results expressed as mg/kg dry weight unless otherwise specified.

RPDs that have been shaded exceed the acceptance criteria

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APPENDIX A – AERIAL PHOTOGRAPHS AND SATELLITE IMAGERY

1947 Aerial Photograph Showing the Site and Surrounds

1961 Aerial Photograph Showing the Site and Surrounds

1970 Aerial Photograph Showing the Site and Surrounds

1986 Aerial Photograph Showing the Site and Surrounds

1994 Aerial Photograph Showing the Site and Surrounds

2007 Aerial Photograph Showing the Site and Surrounds

2014 Aerial Photograph Showing the Site and Surrounds

2016 Aerial Photograph Showing the Site and Surrounds

2017 Aerial Photograph Showing the Site and Surrounds

APPENDIX B – SECTION 149 (2) CERTIFRICATE

LIVERPOOL CITY COUNCIL

PLANNING CERTIFICATE UNDER SECTION 149
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Ref.: 46135867:54156
Ppty: 16795

Cert. No.: 1044

Applicant:
SAI GLOBAL PROPERTY
PO BOX 447
SOUTH MELBOURNE VIC 3205

Receipt No.: 3703110
Receipt Amt.: 53.00
Date: 23-Aug-2017

The information in this certificate is provided pursuant to Section 149(2) of the Environmental Planning and Assessment Act (EP&A Act) 1979, as prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation (EP&A Regulation) 2000. The information has been extracted from Council's records, as they existed at the date listed on the certificate. Please note that the accuracy of the information contained within the certificate may change after the date of this certificate due to changes in Legislation, planning controls or the environment of the land.

The information in this certificate is applicable to the land described below.

Legal Description: **LOT 4 DP 611519**
Street Address: **55 MARTIN ROAD, BADGERYS CREEK NSW 2555**

Note: Items marked with an asterisk (*) may be reliant upon information transmitted to Council by a third party public authority. The accuracy of this information cannot be verified by Council and may be out-of-date. If such information is vital for the proposed land use or development, applicants should instead verify the information with the appropriate authority.

Note: Commonly Used Abbreviations:
LEP: Local Environmental Plan
DCP: Development Control Plan
SEPP: State Environmental Planning Policy
EPI: Environmental Planning Instrument

1. Names of relevant planning instruments and DCPs

(a) The name of each EPI that applies to the carrying out of development on the land is/are listed below:

LEPs:

Liverpool LEP 2008

SEPPs*:

SEPP No. 33 – Hazardous and Offensive Development
SEPP No. 50 – Canal Estate Development
SEPP No. 55 – Remediation of Land
SEPP No. 62 – Sustainable Aquaculture
SEPP No. 65 – Design Quality of Residential Flat Development
SEPP (Building Sustainability Index: BASIX) 2004
SEPP No. 70 – Affordable Housing (Revised Schemes)
SEPP (Infrastructure) 2007
SEPP (Mining, Petroleum Production and Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (State and Regional Development) 2011
SEPP No 19 – Bushland in Urban Areas
SEPP No 21 – Caravan Parks
SEPP No 30 – Intensive Agriculture
SEPP No 44 – Koala Habitat Protection
SEPP (Exempt and Complying Development Codes) 2008
SEPP No 64 – Advertising and Signage
SEPP (Affordable Rental Housing) 2009
SEPP (Sydney Region Growth Centres) 2006

Deemed SEPPs*:

SREP No 20 – Hawkesbury – Nepean River (No. 2 – 1997)

(b) The name of each draft EPI, or Planning Proposal (which has been subject to community consultation).

Draft LEPs:

N/A

Draft SEPPs*:

Draft SEPP (Competition) 2010

(c) The name of each DCP that applies to the carrying out of development on the land.

Liverpool DCP 2008

2. Zoning and land use under relevant LEPs and /or SEPPs

This section contains information required under subclauses 2 and 2A of Schedule 4 of the EP&A Regulation 2000. Subclause 2 of the regulation requires Council to provide information with respect to zoning and land-use in areas zoned by, or proposed to be zoned by, a LEP. Subclause 2A of Schedule 4 of the regulation requires Council to provide information with respect to zoning and land-use in areas which are zoned by, or proposed to be zoned by, the SEPP (Sydney Region Growth Centres) 2006. The land use and zoning information under any EPI applying to the land is given below.

(a) Name of zone, and the EPI from which the land zoning information is derived.

RU1 Primary Production - Liverpool LEP 2008

(b) The purposes for which development may be carried out within the zone without the need for development consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations

(c) The purposes for which development may not be carried out within the zone except with development consent

Agriculture; Airstrips; Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cemeteries; Community facilities; Crematoria; Dual occupancies; Dwelling houses; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Hazardous storage establishments; Health consulting rooms; Helipads; Heliports; Home businesses; Home industries; Landscaping material supplies; Offensive storage establishments; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (outdoor); Roads; Roadside stalls; Rural industries; Rural supplies; Rural workers' dwellings; Secondary dwellings; Veterinary hospitals; Water recreation structures

(d) The purposes for which the instrument provides that development is prohibited within the zone

Any development not specified in item (b) or (c)

(e) If a dwelling house is a permitted use, are there any principal development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house?

No

(f) Does the land include or comprise critical habitat?

No

(g) Is the land is in a conservation area (however described):

No

(h) Is there an item of environmental heritage (however described) situated on the land

No

3. Complying development

The information below outlines whether complying development is permitted on the land as per the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1) (c3) and 1.19 SEPP of the (Exempt and Complying Development Codes) 2008.

The first column identifies the code(s). The second column describes the extent of the land in which exempt and complying development is permitted for the code(s) given to the immediate left. The third column indicates the reason as to why exempt and complying development is prohibited on some or all of the land, and will be blank if such development is permitted on all of the land.

Code	Extent of the land for which development is permitted:	The reason(s) as to why development is prohibited:
General Housing Code and Rural Housing Code	**None**	All of the land is identified as being within an **ANEF** contour of greater than or equal to 25, unless the development is only for the erection of ancillary development, the alteration of or an addition to ancillary development or the alteration of a dwelling house (Clause 1.19(1)(h)

Code	Extent of the land for which development is permitted:	The reason(s) as to why development is prohibited:
Commercial and Industrial (New Buildings and Additions) Code	**All**	
General Development Code, Fire Safety Code, Housing Alterations Code, Commercial and Industrial Alterations Code, Subdivisions Code, and Demolition Code	**All**	

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

Nil

4. Coastal protection*

Has the Department of Finance, Services and Innovation notified Council of the land being affected by 38 or 39 of the Coastal Protection Act, 1979?

No

4A. Certain information relating to beaches and coasts*

(a) Has an order has been made under Part 4D of the Coastal Protection Act 1979 on the land (or on public land adjacent to that land)?

No

(b) Has Council been notified under section 55X of the Coastal Protection Act 1979 that temporary coastal protection works have been placed on the land (or on public land adjacent to that land), and if works have been so placed, is council is satisfied that the works have been removed and the land restored in accordance with that Act?

Not applicable

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

Has the owner (or any previous owner) of the land consented, in writing, that the land is subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act)?

No

5. Mine subsidence*

Is the land a proclaimed to mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

No

6. Road widening and road realignment

Is the land is affected by any road widening or road realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993?*

No

(b) An EPI?

No

(c) A resolution of the council?

No

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

The following table lists hazard/risk policies that have been adopted by Council (or prepared by another public authority and subsequently adopted by Council). The right-most column indicates whether the land is subject to those policies.

Hazard/Risk	Adopted Policy	Does this hazard/risk policy apply to the land?
Landslip hazard	Nil	**No**
Bushfire hazard	Liverpool DCP 2008	**No**

Hazard/Risk	Adopted Policy	Does this hazard/risk policy apply to the land?
	Liverpool Growth Centre Precincts DCP*	**No**
	Edmondson Park South DCP 2012	**No**
	Planning for Bushfire Protection (Rural Fire Services, 2006)*	**No**
	Pleasure Point Bushfire Management Plan	**No**
Tidal inundation	Nil	**No**
Subsidence	Nil	**No**
Acid Sulphate Soils	Liverpool LEP 2008	**No**
	Liverpool DCP 2008	**No**
Potentially Contaminated Land	Liverpool DCP 2008	**Yes**, see section 10 of Part 1 of the Liverpool DCP 2008
	Liverpool Growth Centre Precincts DCP*	**No**
Potentially Saline Soils	Liverpool DCP 2008	**Yes**
	Liverpool Growth Centre Precincts DCP*	**No**

Note: Land for which a policy applies does not confirm that the land is affected by that hazard/risk. For example, all land for which the Liverpool DCP applies is subject to controls relating to contaminated land, as this policy contains triggers and procedures for identifying potential contamination. Applicants are encouraged to review the relevant policy, and other sections of this certificate, to determine what effect, if any, the policy may have on the land.

7A. Flood related development controls information

(a) For the purpose of residential accommodation (excluding group homes or seniors housing), is the land, or part of the land, within the flood planning area and subject to flood planning controls?

No

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

(b) Is development on that land, or part of the land, for any other purpose subject to flood related development controls?

No

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

Note: Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

8. Land reserved for acquisition

Does a LEP, draft LEP, SEPP or draft SEPP identify the acquisition of the land, or part of the land, by a public authority, as referred to in section 27 of the Act?

No

9. Contribution Plans

Liverpool Contributions Plan 2009

9A. Biodiversity certified land*

Is the land, or part of the land, biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995)?

Yes, part/all of the land is bio-diversity certified land

10. Biobanking agreements*

Is the land subject to a bio-banking agreement under Part 7A of the Threatened Species Conservation Act 1995, as notified to Council by the Chief Executive of the Office of Environment and Heritage?

No

11. Bushfire prone land

Is the land or part of the land, bushfire prone land as defined by the EP&A Act 1979?

No

12. Property vegetation plans*

Is Council aware of the land being subject to a Property Vegetation Plan under the Native Vegetation Act 2003?

No, Liverpool is excluded from the operation of the Native Vegetation Act 2003

13. Orders under Trees (Disputes between Neighbours) Act 2006*

Does an order, made under the Trees (Disputes Between Neighbours) Act 2006 in relation to carrying out of work in relation to a tree on the land, apply?

No, Council has not been notified of an order

14. Directions under Part 3A*

Is there a direction (made by the Minister) that a provision of an EPI in relation to a development does not have effect?

No

15. Site compatibility certificates and conditions for seniors housing*

(a) Is there is a current site compatibility certificate (seniors housing), in respect of proposed development on the land?

No, Council has not been notified of an order.

16. Site compatibility certificates for infrastructure*

(a) Is there is a current site compatibility certificate (infrastructure), in respect of proposed development on the land?

No, Council has not been notified of an order

17. Site compatibility certificates and conditions for affordable rental housing*

Is there is a current site compatibility certificate (Affordable housing), in respect of proposed development on the land?

No, Council has not been notified of an order.

18. Paper subdivision information*

Does any development plan adopted by a relevant authority (or proposed plan subject to a consent ballot) apply to the land? If so the date of the subdivision order that applies to the land.

No

19. Site verification certificates*

Does a current site verification certificate, apply to the land?

No, Council is not aware of a site verification certificate

20. Loose-fill asbestos insulation *

Is a dwelling on the land listed on the register (maintained by the NSW Department of Fair Trading) as containing loose-fill asbestos insulation?

No

Note: despite any listing on the register, any buildings constructed before 1980 may contain loose-fill asbestos insulation or other asbestos products.

21. Contaminated land

Is the land:

(a) Significantly contaminated land within the meaning of that Act?

No

(b) Subject to a management order within the meaning of that Act?

No

(c) Subject of an approved voluntary management proposal within the meaning of that Act?

No

(d) Subject to an ongoing maintenance order within the meaning of that Act?

No

(e) Subject of a site audit statement within the meaning of that Act? *

No

Note: in this clause 'the Act' refers to the Contaminated Land Management Act 1997.

Luke West
Administration Services Coordinator
Liverpool City Council

For further information, please contact
CALL CENTRE – 1300 36 2170

APPENDIX C – HISTORICAL TITLES

SEARCH REPORT

LPI RECORDS BRANCH

SUBJECT LAND: Lot 4 in DP 611519

55 Martin Road, Badgerys Creek

OWNERSHIP:

From 17/2/1930 to 15/4/1943 - The Sydney City Mission

From 15/4/1943 to 1/6/1981 - Mervyn Joseph Nobbs of Badgerys Creek, Farmer

From 1/6/1981 to 6/5/1998 - Kenneth John Nobbs & Jeffrey Nobbs

From 6/5/1998 to date - Helen Nobbs & Jeffrey Nobbs

LEASES – NIL

24th August 2107

SAI Global

per R Williamson

[redacted]RTIFICATE OF TITLE

NEW SOUTH WALES [redacted]ROPERTY ACT, 1900, as amended.

10483103

Vol. 10483 Fol. 103

Appln. No.8474

Prior Title Vol.1565 Fol. 58

Edition issued 20-1-1967

AS K526490

CANCELLED

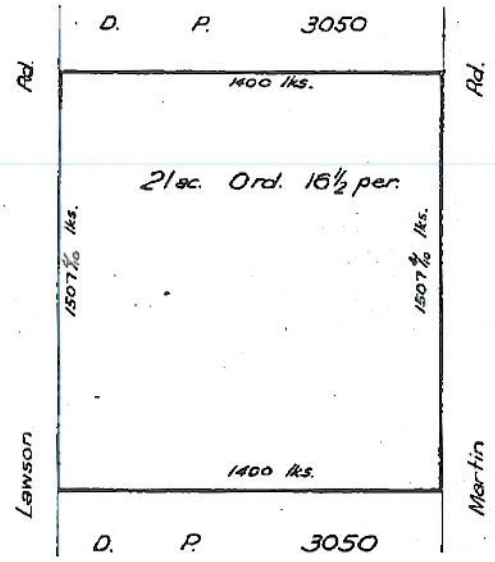
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness S. Vandine

Registrar General.

(Page 1) Vol. 10483 Fol. 103

PLAN SHOWING LOCATION OF LAND



K526490

Scale : 5 chains to one inch.

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in the land shown in plan lodged with Transfer No.394029 (Filed as F.P.105559) in the City of Liverpool Parish of Bringelly and County of Cumberland, being part of Lot 37 in Deposited Plan 3050 shown in the plan hereon being part of Portion 31 granted to Thomas Matcham Pitt on 1-1-1810 and part of Portion 32 granted to Edward Powell on 1-1-1810.

FIRST SCHEDULE (Continued overleaf)

MERVYN JOSEPH NOBBS of Badgerys Creek, Farmer.

Registrar General

SECOND SCHEDULE (Continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grants above referred to.

Registrar General

Vol. 10483 Fol 103

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar-General
This deed is cancelled as to the whole New certificates of Title have issued on 23-9-1980 for lots in superseded Plan No 611519 as follows: Lots 1 to 4 Vol 14139 Fol 201 to 204 respectively. REGISTRAR GENERAL NEW CERTIFICATE(S) OF TITLE ISSUING ON DP 611519 NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH.					

D.P. 611519
4/2/9/80

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar-General	CANCELLATION		
	DP 611519		Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan 611519	1-9-1980.				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR-GENERAL ARE CANCELLED

(Page 2 of 2 pages)

[redacted]IFICATE OF TITLE

NEW SOUTH WALES [redacted]REAL PROPERTY ACT, 1900

14239-204

Appln. No. 8474

Prior Title Vol. 10483 Fol. 103

Vol. 14239 Fol. 204

EDITION ISSUED

24 9 1980

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

14239 Fol. 204

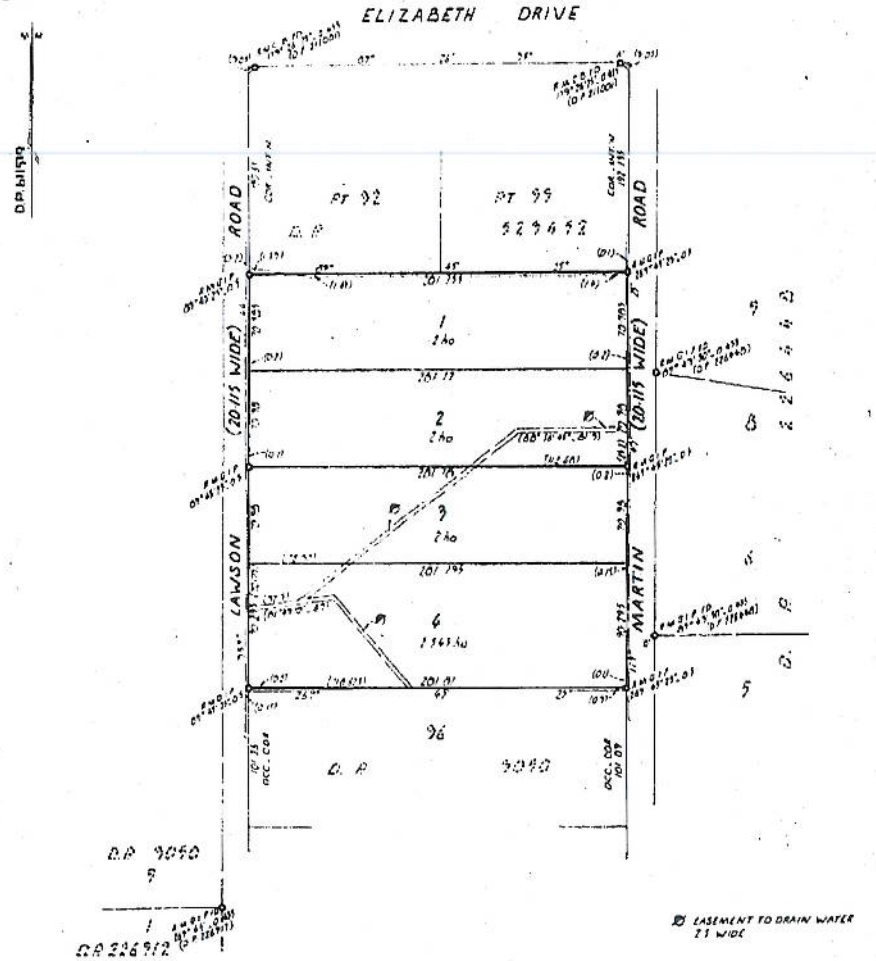
(Page 1) Vol.

CANCELLED

SEE AUTO FOLIO

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 4 in Deposited Plan 611519 at Badgerys Creek in the City of Liverpool Parish of Bringelly and County of Cumberland being part of Portion 31 granted to Thomas Mactcham Pitt on 1-1-1810.

FIRST SCHEDULE

~~MERVYN JOSEPH NOBBS~~ [redacted] ~~Badgerys Creek, Farmer.~~

SECOND SCHEDULE

GRY

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. DP611519 Easement to drain water affecting the land shown so burdened in Deposited Plan 611519.

EW (SB)

S486941 T & R
W715577M

Vol. 14239 Fol. 204

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
Kenneth John Nobbs in ½ share and Jeffrey Nobbs in ½ share as tenants in common by Transfer S486941. Registered 1-6-1981.				

CANCELLED

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
MC W715577P		Mortgage to Commonwealth Savings Bank of Australia. Registered 2-2-1987				

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
24/8/2017 7:36PM

FOLIO: 4/611519

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 14239 FOL 204

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
8/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
10/11/1993		AMENDMENT: LOCAL GOVT AREA	
16/11/1993		AMENDMENT: LOCAL GOVT AREA	
3/2/1994	I994268	DISCHARGE OF MORTGAGE	EDITION 1
6/5/1998	3965120	TRANSFER	EDITION 2

*** END OF SEARCH ***

jennfib PRINTED ON 24/8/2017

Form: 97-01T
Licence: AUS/0634/96

(1)

TRANSFER

New South Wales
Real Property Act 1900

3965120 D

Instructions for filling out this form are available from the Land Titles Office

Office of State Revenue use only

270198 8307 04 00221754O/01
N.S.W. STAMP DUTY $2690.00

(A) **LAND TRANSFERRED**
If appropriate, specify the share or part transferred.

FOLIO IDENTIFIER 4/611519

(B) **LODGED BY**

LTO Box	Name, Address or DX and Telephone
28A	GALLOWAY & CO. Phone: (02) 9233 1011 Fax: (02) 9232 6491 DX 340, SYDNEY L.T.O. Delivery 28A Reference (15 character maximum): Blumon - Nobbs

(C) **TRANSFEROR** KENNETH JOHN NOBBS and JEFFREY NOBBS

(D) acknowledges receipt of the consideration of EIGHT FIVE THOUSAND DOLLARS ($85,000.00) paid to KENNETH JOHN NOBBS and as regards the land specified above transfers to the transferee an estate in fee simple. ~~as to the my half interest as~~

OFFICE OF STATE REVENUE (N.S.W. TREASURY) T1 ALTERATION NOTED 1996/97

(E) Encumbrances (if applicable): 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T
TS (s713 L
TW (Sheriff)

HELEN NOBBS and JEFFREY NOBBS

(G) TENANCY: ~~TO HOLD AS JOINT TENANT WITH JEFFREY NOBBS~~ JOINT TENANTS

OFFICE OF STATE REVENUE (N.S.W. TREASURY) T1 ALTERATION NOTED 1996/97

(H) We certify this dealing correct for the purposes of the Real Property Act 1900. **DATE** 22nd JANUARY 1998

Signed in my presence by the transferor who is personally known to me.

Signature of Witness

JOHN MONTGOMERY
Name of Witness (BLOCK LETTERS)

85-87 MOORE ST. LIVERPOOL
Address of Witness

J. Nobbs.
K.J. Nobbs.
Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Signature of Witness

JOHN MONTGOMERY
Name of Witness (BLOCK LETTERS)

85-87 MOORE ST. LIVERPOOL
Address of Witness

J. Nobbs.
Helen Nobbs
Signature of Transferee

If signed on the transferee's behalf by a solicitor or licensed conveyancer, show the signatory's full name in block letters.

Checked by (LTO use) .....

APPENDIX D – SAFEWORK NSW NOTICE

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D17/200628
Your Ref: David Yonge

1 September 2017

Attention: David Yonge
STS Geoenvironmental Pty Ltd
PO BOX 6989
Wetherill Park NSW 2164

Dear Mr Yonge

RE SITE: 55 Martin Rd Badgerys Creek NSW

I refer to your site search request received by SafeWork NSW on 28 August 2017 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

APPENDIX E – SOIL PROFILE LOGS

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 1**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S1/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D-M
			BOREHOLE DISCONTINUED AT 0.3 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 2**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S2-1/DUP/TRI @ 0.2 m S2-2 @ 0.5 m		SILTY CLAY: dark brown, medium plasticity TOPSOIL	CL	FIRM TO STIFF	D
	U50 0.5-0.8 m S2-3 @ 1.0 m B @ 0.5- 1.1 m	1.0	SILTY CLAY: red brown with orange brown and light grey, medium to high plasticity	CL/CH	STIFF	D-M M
WT 18/12/17	S2-4 @ 1.5 m S2-5 @ 2.0 m S2-6 @ 2.5 m S2-7 @ 3.0 m	2.0 3.0	SILTY CLAY: light grey with yellow brown/orange brown, medium to high plasticity	CL/CH	VERY STIFF	M M-D
	S2-8 @ 4.0 m	4.0 5.0	WEATHERED SHALE: dark grey with light grey, clay seams, trace of fine grained sand STANDPIPE PIEZOMETER INSTALLED BOREHOLE DISCONTINUED AT 6.0 M ON WEATHERED SHALE		EXTREMELY LOW STRENGTH	D D-M

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS

Equipment: Edson RP70

Hole Diameter (mm): 100

Angle from Vertical (^{o}):

Drill Bit: Spiral

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 3**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S3/1 @ 0.2 m		SILTY CLAY: brown with light brown, low to medium plasticity, trace of gravel	CL	FIRM TO STIFF	D-M
			TOPSOIL			
	S3/2 @ 0.8 m		SILTY CLAY: light brown with light grey and some light orange, medium to high plasticity, trace of grave	CL/CH	STIFF	M
		1.0				
	S3/3 @ 1.6 m		SILTY CLAY: grey with light grey and some light brown, low to medium plasticity, trace of gravel	CL	VERY STIFF	D-M
		2.0				
		3.0				
			WEATHERED SHALE: grey with light grey		EXTREMELY LOW STRENGTH	
			AUGER REFUSAL AT 3.2 M ON WEATHERED SHALE			
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 4**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S4/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel	CL	STIFF	D-M
			TOPSOIL			
	S4/2 @ 0.7 m		SILTY CLAY: light brown with orange brown, low to medium plasticity, trace of gravel, trace of fine grained sand	CL	STIFF	M
	S4/3 @ 0.9 m					
	B 1.0-1.4 m	1.0	SILTY CLAY: orange brown with light grey and some light brown, medium to high plasticity, trace of gravel	CL/CH	VERY STIFF	M
	S4/4 @ 1.4 m		SILTY CLAY: light grey with light brown, medium to high plasticity, trace of gravel	CL/CH	VERY STIFF	M
	S4/5 @ 2.1 m	2.0	SILTY CLAY: light brown with grey and some light grey, low to medium plasticity, trace of shale	CL	VERY STIFF	M
	S4/6 @ 3.0 m	3.0	SILTY CLAY: grey with light grey, low to medium plasticity, trace of shale	CL	VERY STIFF	M
			WEATHERED SHALE: grey with dark grey		EXTREMELY LOW STRENGTH	
		4.0	AUGER REFUSAL AT 3.8 M ON WEATHERED SHALE			
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 5**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S5/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
			BOREHOLE DISCONTINUED AT 0.3 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 6**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S6/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel	CL	STIFF	D
	S6/2 @ 0.6 m		TOPSOIL SILTY CLAY: light brown with light grey, low to medium plasticity, trace of gravel	CL	VERY STIFF	D-M
	U50	1.0				
	S6/3 @ 1.6 m		SILTY CLAY: light grey with grey, medium to high plasticity, trace of gravel	CL/CH	VERY STIFF	M
	S6/4 @ 2.4 m	2.0	SILTY CLAY: light brown with light grey, low to medium plasticity, trace of gravel	CL	VERY STIFF	D-M
		3.0	WEATHERED SHALE: light brown with brown		EXTREMELY LOW STRENGTH	
			AUGER REFUSAL AT 3.3 M ON WEATHERED SHALE			
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 7**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S7/1 @ 0.2 m		SILTY CLAY: brown with light brown, low to medium plasticity, trace of gravel	CL	STIFF	D-M
	S7/2 @ 0.7 m		TOPSOIL SILTY CLAY: light brown with light grey, low to medium plasticity, trace of gravel	CL	VERY STIFF	D-M
	U50	1.0				
	S7/3 @ 1.6 m	2.0	SILTY CLAY: light grey with light brown, medium to high plasticity, trace of gravel	CL/CH	VERY STIFF	M
	S7/4 @ 2.8 m	3.0	SILTY CLAY: grey with light grey and some orange brown, low to medium plasticity, trace of shale	CL	VERY STIFF	M
			WEATHERED SHALE: grey with dark grey		EXTREMELY LOW STRENGTH	
		4.0	AUGER REFUSAL AT 3.6 M ON WEATHERED SHALE			
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 8**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S1/DUP/TRI @ 0.2 m		SILTY CLAY: dark brown, low plasticity	CL	FIRM TO STIFF	D
	S8/2 @ 0.5 m		TOPSOIL			
	B @0.3-0.9m		SILTY CLAY: orange brown with light grey, medium to high plasticity	CL/CH	STIFF	M
	S8/3 @ 1.0m	1.0	SILTY CLAY: light grey with yellow brown/orange brown, medium to high plasticity	CL/CH	STIFF	M
	S8/4 @ 1.5 m					
	S8/5 @ 2.0 m	2.0			VERY STIFF	
	S8/6 @ 2.5 m					
WT 18/12/17			WEATHERED SHALE: dark grey with occasional light grey, trace of fine grained sand		EXTREMELY LOW STRENGTH	D
	S8/7 @ 3.0 m	3.0				
	S8/8 @ 4.0 m	4.0				
		5.0				
			STANDPIPE PIEZOMETER INSTALLED			
			BOREHOLE DISCONTINUED AT 6.0 M			

D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)
S - jar sample

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (^{o}):
Drill Bit: Spiral

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 9**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S9/1 @ 0.2 m		SILTY CLAY: dark brown, low plasticity TOPSOIL	CL	FIRM TO STIFF	D
			SILTY CLAY: orange brown with light grey, medium to high plasticity	CL/CH	STIFF	M-D
		1.0				
			SILTY CLAY: light grey with orange brown, medium to high plasticity	CL/CH	VERY STIFF	M
		2.0	WEATHERED SHALE: light grey with dark grey, fine grained, clay seams		EXTREMELY LOW STRENGTH	D
		3.0				
		4.0	AUGER REFUSAL AT 4.0 M ON WEATHERED SHALE			
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Edson RP70

Hole Diameter (mm): 100/200/300

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 10**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S10/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
			BOREHOLE DISCONTINUED AT 0.3 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 11**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S1/DUP/TRI @ 0.2 m		SILTY CLAY: dark brown/orange brown, medium plasticity TOPSOIL	CL	FIRM TO STIFF	D-M
		1.0	SILTY CLAY: orange brown with light grey, medium to high plasticity	CL/CH	STIFF	M
		2.0	SILTY CLAY: light grey with orange brown and yellow brown, medium plasticity, trace of fine grained sand	CL	VERY STIFF	M-D
		3.0				
		4.0	WEATHERED SHALE: light brown with orange brown and dark grey, fine grained, clay seams		EXTREMELY LOW STRENGTH	D
		5.0	AUGER REFUSAL AT 4.5 M ON WEATHERED SHALE			

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS

Equipment: Edson RP70

Hole Diameter (mm): 100

Angle from Vertical (^{o}):

Drill Bit: Spiral

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 12**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S12/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
			BOREHOLE DISCONTINUED AT 0.3 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 13**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S12/1 @ 0.2 m B1 @ 0.4 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
		1.0	SILTY CLAY: light brown with orange brown, low to medium plasticity, trace of gravel	CL		D
		2.0	BOREHOLE DISCONTINUED AT 1.5 M			
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 14**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S14/1 @ 0.2 m B2 @ 0.4 m		SILTY CLAY: dark brown with brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
	S14/2 @ 0.9 m	1.0	SILTY CLAY: light brown with orange brown, low to medium plasticity, trace of gravel	CL		D
		2.0	BOREHOLE DISCONTINUED AT 1.5 M			
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 15**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	B4/S15-1 @ 0.2 m		SILTY CLAY: dark brown, low plasticity TOPSOIL	CL	FIRM	D
	S15/2 @ 0.5 m		SILTY CLAY: orange brown with light grey, medium to high plasticity	CL/CH	FIRM TO STIFF	D-M
	U50				STIFF	
	S15/3 @ 1.0 m	1.0			VERY STIFF	
	S15/4 @ 1.5 m		WEATHERED SANDSTONE: dark grey with light grey and orange brown, fine grained, clay seams			D
	S15/5 @ 2.0 m	2.0				
	S15/6 @ 2.5 m					
	S15/7 @ 3.0 m	3.0				D-M
	S15/8 @ 4.0 m	4.0				D
			AUGER REFUSAL AT 4.3 M ON WEATHERD SANDSTONE STANDPIPE PIEZOMETER INSTALLED			
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)
S - jar sample

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (^{o}):
Drill Bit: Spiral

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 16**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S16/1 @ 0.2 m		SILTY CLAY: dark brown, low plasticity TOPSOIL			
			BOREHOLE DISCONTINUED AT 0.2 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Edson RP70

Hole Diameter (mm): 100

Angle from Vertical (^{o}):

Drill Bit: Spiral

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 17**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: JK Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S17/1 @ 0.2 m B 0.4-1.0		SILTY CLAY: dark brown, low plasticity TOPSOIL	CL	FIRM TO STIFF	D
			SILTY CLAY: orange brown with light grey, medium to high plasticity	CL/CH	STIFF	M
		1.0	SANDY CLAY: light grey with orange brown, fine grained sand, medium plasticity	CL	STIFF VERY STIFF	M-D
		2.0				M
		3.0				
			WEATHERED SHALE: light grey with orange brown and yellow brown, trace of fined grained sand		EXTREMELY LOW STRENGTH	D
		4.0				
		5.0	AUGER REFUSAL AT 5.0 M ON WEATHERED SHALE			

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS

Equipment: Edson RP70

Hole Diameter (mm): 100

Angle from Vertical (^{o}):

Drill Bit: Spiral

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 18**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S18/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL			
			BOREHOLE DISCONTINUED AT 0.3 M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

STS GeoEnvironmental Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: AMJ Demolition and Excavation P/L	Project / STS No.: 21649/8652C	**BOREHOLE NO.: BH 19**
Project: 55 Martin Road, Badgerys Creek	Date: December 12, 2017	
Location: Refer to Drawing No. 18/0089/3	Logged: DL Checked By: MG	Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S19/1 @ 0.2 m		SILTY CLAY: brown with dark brown, low to medium plasticity, trace of gravel TOPSOIL	CL		D
			BOREHOLE DISCONTINUED AT 0.3M			
		1.0				
		2.0				
		3.0				
		4.0				
		5.0				

D - disturbed sample U - undisturbed tube sample B - bulk sample

WT - level of water table or free water N - Standard Penetration Test (SPT)

S - jar sample

Contractor: STS

Equipment: Christie

Hole Diameter (mm): 100/200/300

Angle from Vertical (^{o}):

Drill Bit: V/Spiral/Two Prong

NOTES: See explanation sheets for meaning of all descriptive terms and symbols

APPENDIX F – CHAIN OF CUSTODY DOCUMENTATION

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)** custody seal intact? Yes No N/A
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT **(List due date):**	temp of cooler on receipt? Yes No N/A
PROJECT: 21649	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)** COC: 3	receipt sample temperature on receipt: °C
ORDER NUMBER: E-2017-713		OF:	other comment:
ORDER NUMBER: E-2017-713	**CONTACT PH:**		
SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:** DATE/TIME: 14/12/2017 1600	**RECEIVED BY:** ANDREW DATE/TIME: 14/12/17 4pm	**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** DATE/TIME:
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**				
Email Reports to (will default to PM if no other addresses are listed):					
Email Invoice to (will default to PM if no other addresses are listed):					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	21649/S7/2-1	14/12/2017	S	JAR + ICE	1		x	x						
2	21649/S7/3-1	14/12/2017	S	JAR + ICE	1									
3	21649/S7/4-1	14/12/2017	S	JAR + ICE	1									
4	21649/S8-1	14/12/2017			1	x	x	x	x		Outbox / Envirolab Lab / Dpat WO			
5	21649/S8-2	14/12/2017			1			x	x	x	Lab / Address:			Asbestos
6	21649/S8-3	14/12/2017			1				x		Organised By / Date:			
7	21649/S8-4	14/12/2017			1				x	x	Relinquished By / Date:			Neveah
8	21649/S8-5	14/12/2017			1				x	x	Courier:			
9	21649/S8-6	14/12/2017			1				x		WO No:			
10	21649/S8-7	14/12/2017			1				x	x	Attach By PO / Internal Sheet:			
11	21649/S8-8	14/12/2017			1				x					
12	21649/S9-1	14/12/2017	S	JAR + ICE, B	1		x		x					
				TOTAL	12	1	3	3	9	4	4	0	0	

Environmental Division Sydney
Work Order Reference
ES1731925

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

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☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	**TURNAROUND REQUIREMENTS :** ☐ Standard TAT **(List due date):** ######	**FOR LABORATORY USE ONLY (Circle)**	
OFFICE: 14/1 Cowpasture Place Wetherill Park	(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) ☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact?	Yes / No / N/A
PROJECT: 21649	**ALS QUOTE NO.:**	Cooling Medium Present?	Yes / No / N/A
ORDER NUMBER: E-2017-713		Cooling Medium Type: Ice / Ice Pack / None	
PROJECT MANAGER:	**CONTACT PH:**	Samples Received at: °C	
		Other Comments:	

COC SEQUENCE NUMBER (Circle) — COC: 4 OF: 5

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:** RC	**RECEIVED BY:** ANDREW
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	DATE/TIME: 14/12/2017 1600	DATE/TIME: 14/12/17 4:02pm
Email Reports to (will default to PM if no other addresses are listed):		**RELINQUISHED BY:**	**RECEIVED BY:**
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	21649/S10/1-1	14/12/2017	S	JAR + ICE, B	1		x							
14	21649/S11-1	14/12/2017	S	JAR + ICE, B	1	x		x	x					
15	21649/S12/1-1	14/12/2017	S	JAR + ICE, B	1			x	x					
16	21649/S13/1-1	14/12/2017	S	JAR + ICE	1				x		x	x		
17	21649/S13/1-2	14/12/2017	S	JAR + ICE	1									
18	21649/S14/1-1	14/12/2017	S	JAR + ICE, B	1	x		x						
19	21649/S14/1-2	14/12/2017	S	JAR + ICE	1			x	x		x	x		
20	21649/S15-1	14/12/2017	S	JAR + ICE, B	1	x		x	x					
21	21649/S15-2	14/12/2017	S	JAR + ICE	1				x	x	x			
22	21649/S15-3	14/12/2017	S	JAR + ICE	1				x	x	x			
23	21649/S15-4	14/12/2017	S	JAR + ICE	1				x					
24	21649/S15-5	14/12/2017	S	JAR + ICE	1				x	x	x			
				TOTAL	12	3	1	5	9	3	5	2	0	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
PROJECT: 21649	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Cooler Temperature on Receipt (°C): Yes No N/A
ORDER NUMBER: E-2017-713		COC: 5	Random Sample Temperature on Receipt (°C):
PROJECT MANAGER:	**CONTACT PH:**	OF: 5	Other Comments:

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:**	**RECEIVED BY:** ANDREW
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	DATE/TIME: 14/12/17 1600	DATE/TIME: 14/12/17 4:02pm
Email Reports to (will default to PM if no other addresses are listed):		**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOLID (S) WATER (W))			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EA200F	S12	S2	S19	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	21649/S15-6	14/12/2017	S	JAR + ICE	1					x	x	x		
26	21649/S15-7	14/12/2017	S	JAR + ICE	1					x				
27	21649/S15-8	14/12/2017	S	JAR + ICE	1					x				
28	21649/S16/1-1	14/12/2017	S	JAR + ICE, B	1	x	x		x					
29	21649/S17-1	14/12/2017	S	JAR + ICE, B	1					x				
30	21649/S18/1-1	14/12/2017	S	JAR + ICE, B	1	x		x						
31	21649/S19/1-1	14/12/2017	S	JAR + ICE, B	1					x				
					1									
					1									
					1									
					1									
					1									
				TOTAL	12	2	1	1	1	5	1	1	0	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services

OFFICE: 14/1 Cowpasture Place Wetherill Park

PROJECT: 21649

ORDER NUMBER:E-2017-713

ORDER NUMBER:E-2017-713

CONTACT PH:

SAMPLER:

SAMPLER MOBILE:

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)

☐ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC: 3

OF:

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt: °C

Other comment:

RELINQUISHED BY: [signature]

DATE/TIME: 14/12/2017 1600

RECEIVED BY: ANDREW

DATE/TIME: 14/12/17 4:02pm

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	21649/S7/2-1	14/12/2017	S	JAR + ICE	1		x	x						
2	21649/S7/3-1	14/12/2017	S	JAR + ICE	1									
3	21649/S7/4-1	14/12/2017	S	JAR + ICE	1									
4	21649/S8-1	14/12/2017			1	x	x	x	x					
5	21649/S8-2	14/12/2017			1			x	x	x	x			
6	21649/S8-3	14/12/2017			1				x					
7	21649/S8-4	14/12/2017			1				x	x	x			
8	21649/S8-5	14/12/2017			1				x	x	x			
9	21649/S8-6	14/12/2017			1				x					
10	21649/S8-7	14/12/2017			1				x	x	x			
11	21649/S8-8	14/12/2017			1				x					
12	21649/S9-1	14/12/2017	S	JAR + ICE, B	1		x		x					
				TOTAL	12	1	3	3	9	4	4	0	0	

Subcon / Forward Lab / Split WO
Lab / Analysis: Asbestos
Organised By / Date:
Relinquished By / Date: Newcastle
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES1731925

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: SMEC Testing Services	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT **(List due date):** ######	**FOR LABORATORY USE ONLY (Circle)** Security Seal Intact: Yes / No / N/A
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT **(List due date):**	Free ice / Frozen ice bricks present upon arrival: Yes / No / N/A
PROJECT: 21649	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Cooling:
ORDER NUMBER: E-2017-713		COC: 4	Random Sample Temperature on Receipt: °C
PROJECT MANAGER:	**CONTACT PH:**	OF: 5	Other Comments:

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:** RK	**RECEIVED BY:** ANDREW	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**	DATE/TIME: 14/12/2017 10am	DATE/TIME: 14/12/17 4:02pm	DATE/TIME:	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed):					
Email Invoice to (will default to PM if no other addresses are listed):					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOIL (S) WATER (W))			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	21649/S10/1-1	14/12/2017	S	JAR + ICE, B	1		x							
14	21649/S11-1	14/12/2017	S	JAR + ICE, B	1	x		x	x					
15	21649/S12/1-1	14/12/2017	S	JAR + ICE, B	1			x	x					
16	21649/S13/1-1	14/12/2017	S	JAR + ICE	1				x		x	x		
SWR 17	21649/S13/1-2	14/12/2017	S	JAR + ICE	1									
18	21649/S14/1-1	14/12/2017	S	JAR + ICE, B	1	x		x						
19	21649/S14/1-2	14/12/2017	S	JAR + ICE	1			x	x		x	x		
20	21649/S15-1	14/12/2017	S	JAR + ICE, B	1	x		x	x					
21	21649/S15-2	14/12/2017	S	JAR + ICE	1				x	x	x			
22	21649/S15-3	14/12/2017	S	JAR + ICE	1				x	x	x			
23	21649/S15-4	14/12/2017	S	JAR + ICE	1				x					
24	21649/S15-5	14/12/2017	S	JAR + ICE	1				x	x	x			
				TOTAL	12	3	1	5	9	3	5	2	0	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: SMEC Testing Services	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: 21649	**ALS QUOTE NO.:**	**COC SEQUENCE NUMBER (Circle)**	Free ice / ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: E-2017-713		COC: 5	Cooling Method:
PROJECT MANAGER:	**CONTACT PH:**	OF: 5	Random Sample Temperature on Receipt: °C
			Shipping Information:

SAMPLER:	**SAMPLER MOBILE:**	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:** / **RECEIVED BY:**
COC emailed to ALS? (YES / NO)	**EDD FORMAT (or default):**			
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 14/12/17 1600	DATE/TIME: 14/12/17 4:02pm	DATE/TIME: / DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOLID (S) WATER (W))			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	EA200F	S12	S2	S19	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	21649/S15-6	14/12/2017	S	JAR + ICE	1					x	x	x		
26	21649/S15-7	14/12/2017	S	JAR + ICE	1					x				
27	21649/S15-8	14/12/2017	S	JAR + ICE	1					x				
28	21649/S16/1-1	14/12/2017	S	JAR + ICE, B	1	x	x		x					
29	21649/S17-1	14/12/2017	S	JAR + ICE, B	1					x				
30	21649/S18/1-1	14/12/2017	S	JAR + ICE, B	1	x		x						
31	21649/S19/1-1	14/12/2017	S	JAR + ICE, B	1					x				
	Received Extra Sample				1									
32	TRip 1	35 Dup1			1									
33	TRip2	36 Dup2			1									
34	TRip3	37 Dup3			1									
					1									
				TOTAL	12	2	1	1	1	5	1	1	0	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: 21649	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: E-2017-713		COC: 1	Random Sample Temperature on Receipt: °C
PROJECT MANAGER:	CONTACT PH:	OF: 5	Other comments:
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 14/12/2017 1600	DATE/TIME: 14/12/17 4:02pm
Email Reports to (will default to PM if no other addresses are listed):		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed):		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOLID (S) WATER (W))			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	21649/S1/1-1	14/12/2017			1	x	x	x	x					
2	21649/S2-1	14/12/2017			1	x	x							
3	21649/S2-2	14/12/2017			1		x	x	x					
4	21649/S2-3	14/12/2017			1				x	x	x			
5	21649/S2-4	14/12/2017			1				x					
6	21649/S2-5	14/12/2017			1				x	x	x			
7	21649/S2-6	14/12/2017			1				x	x				
8	21649/S2-7	14/12/2017			1				x					
9	21649/S2-8	14/12/2017	S	JAR + ICE	1				x	x	x			
10	21649/S3/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x						
11	21649/S3/2-1	14/12/2017	S	JAR + ICE	1		x	x						
12	21649/S3/3-1	14/12/2017	S	JAR + ICE	1									
				TOTAL	12	3	5	4	8	4	4	0	0	

Environmental Division Sydney
Work Order Reference
ES1731937

Telephone : + 61-2-8784 8555

Received / Date / Time: Neveal
Released By / Date: Asbestos
Organised By / Date:
Relinquished By / Date:
Courier / Carrier:
WO No:
Attach By PO / Internal Sheet:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

☐BRISBANE 32 Stand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: 14/1 Cowpasture Place Wetherill Park		
PROJECT: 21649	ALS QUOTE NO.:	
ORDER NUMBER:E-2017-713		
PROJECT MANAGER:	CONTACT PH:	
SAMPLER:	SAMPLER MOBILE:	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt		°C	
Other comments:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 14/12/2017 1100	DATE/TIME: 14/12/17 4:02pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	21649/S4/1-1	14/12/2017	S	JAR + ICE, B	1		x	x	x					
14	21649/S4/2-1	14/12/2017	S	JAR + ICE	1			x						
15	21649/S4/3-1	14/12/2017	S	JAR + ICE	1									
16	21649/S4/4-1	14/12/2017	S	JAR + ICE	1									
17	21649/S4/5-1	14/12/2017	S	JAR + ICE, B	1	x	x	x						
18	21649/S4/6-1	14/12/2017	S	JAR + ICE, B	1	x		x						
19	21649/S5/1-1	14/12/2017	S	JAR + ICE	1									
20	21649/S6/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x	x					
21	21649/S6/2-1	14/12/2017	S	JAR + ICE	1			x						
22	21649/S6/3-1	14/12/2017	S	JAR + ICE	1									
23	21649/S6/4-1	14/12/2017	S	JAR + ICE	1									
24	21649/S7/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x	x					
				TOTAL	12	4	4	7	3	0	0	0	0	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

- ☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
- ☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
- ☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
- ☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
- ☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
- ☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
- ☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
- ☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
- ☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
- ☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
- ☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
- ☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services

OFFICE: 14/1 Cowpasture Place Wetherill Park

PROJECT: 21649

ORDER NUMBER: E-2017-713

PROJECT MANAGER:

CONTACT PH:

SAMPLER:

SAMPLER MOBILE:

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)

☐ Standard TAT **(List due date):**

☐ Non Standard or urgent TAT **(List due date):**

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)

COC: 1

OF: 5

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:			
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[signature]	ANDREW		
DATE/TIME: 14/12/2017 1600	DATE/TIME: 14/12/17 4:02pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)		CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	21649/S1/1-1	14/12/2017			1	x	x	x	x					
2	21649/S2-1	14/12/2017			1	x	x							
3	21649/S2-2	14/12/2017			1		x	x	x					
4	21649/S2-3	14/12/2017			1				x	x	x			
5	21649/S2-4	14/12/2017			1				x					
6	21649/S2-5	14/12/2017			1				x	x	x			
7	21649/S2-6	14/12/2017			1				x	x				
8	21649/S2-7	14/12/2017			1				x					
9	21649/S2-8	14/12/2017	S	JAR + ICE	1				x	x	x			
10	21649/S3/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x						
11	21649/S3/2-1	14/12/2017	S	JAR + ICE	1		x	x						
12	21649/S3/3-1	14/12/2017	S	JAR + ICE	1									
				TOTAL	12	3	5	4	8	4	4	0	0	

Environmental Division
Sydney
Work Order Reference
ES1731937
Telephone : + 61-2-8784 8555

Subcon / Forwards Lab / Split WO
Lab / Analysis: Newcal
Organised By / Date:
Relinquished By / Date: Asbestos
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
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☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-16 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: SMEC Testing Services	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):
OFFICE: 14/1 Cowpasture Place Wetherill Park		☐ Non Standard or urgent TAT (List due date):
PROJECT: 21649	ALS QUOTE NO.:	
ORDER NUMBER:E-2017-713		
PROJECT MANAGER:	CONTACT PH:	
SAMPLER:	SAMPLER MOBILE:	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):		
Email Invoice to (will default to PM if no other addresses are listed):		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Cooling Present? Yes No N/A

Receipt Sample Temperature on Receipt

Free ice / frozen ice blocks present on receipt

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 14/12/2017 1600	DATE/TIME: 14/12/17 4:02pm	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS (MATRIX: SOLID (S), WATER (W))			CONTAINER INFORMATION	ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	EA200F	S12	S2	EC + pH	SO4	CEC + ESP	Phosphorous Sorption Cap	
13	21649/S4/1-1	14/12/2017	S	JAR + ICE, B	1		x	x	x				Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
14	21649/S4/2-1	14/12/2017	S	JAR + ICE	1			x					
15	21649/S4/3-1	14/12/2017	S	JAR + ICE	1								
16	21649/S4/4-1	14/12/2017	S	JAR + ICE	1								
17	21649/S4/5-1	14/12/2017	S	JAR + ICE, B	1	x	x	x					
18	21649/S4/6-1	14/12/2017	S	JAR + ICE, B	1	x		x					
19	21649/S5/1-1	14/12/2017	S	JAR + ICE	1								
20	21649/S6/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x	x				
21	21649/S6/2-1	14/12/2017	S	JAR + ICE	1			x					
22	21649/S6/3-1	14/12/2017	S	JAR + ICE	1								
23	21649/S6/4-1	14/12/2017	S	JAR + ICE	1								
24	21649/S7/1-1	14/12/2017	S	JAR + ICE, B	1	x	x	x	x				
				TOTAL	12	4	4	7	3	0	0	0	0

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

X BRISBANE 2 Byth Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

Environmental Division
Brisbane
Work Order Reference
EB1801606

Telephone : +61-7-3243 7222

CLIENT: South 32 GEMCO	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	
OFFICE: Groote Eylandt NT		☐ Non Standard or urgent TAT (List due date):	
PROJECT: Groote Eylandt Potable Water Analysis PROJECT NO.:	ALS QUOTE NO.: BN/157/16	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 SOF: 1 2 3 4 5 6 7	
PURCHASE ORDER NO.: 4540508169	COUNTRY OF ORIGIN: Australia		
PROJECT MANAGER: NPI Supervisor	CONTACT PH: 0451 826 760		
SAMPLER: PLEASE NOTIFY MICK MURNIG	SAMPLER MOBILE: 0451 826 760	RELINQUISHED BY: M. MURNIG	RECEIVED BY:
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default): GEMCO, Envirosys	DATE/TIME: 10/1/18 1300	DATE/TIME: 1/1/18 1025
Email Reports to: Charl Boase, Martin Belsey, Patrick Graham, Terence Farrell, Colin Gray, Joshua Preston, Shane Bowery, Gemco Township Services, GEMCO Support@SRA, Michael Murnig, Simon Lewer			
Email Invoice to: Accounts Payable via ALS Costing			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) When Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES									Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
		10-01-2018												PLEASE RETURN
1	Rising Main	1307	W	STT & VS	3	X	X	X						ICEBLOCKS &
2	MedCen	1314	W	STT	1	X	X							INSERTS
3	HSE 221	1320	W	STT	1	X	X							
4	HSE 276	1332	W	STT	1	X	X							
5	Port Crib	12:51	W	STT & VS	3	X	X	X						
6	HSE 60	12:59	W	STT	1	X	X							
7	SwimPool	1348	W	STT	1	X	X							
8	PU Wksnp	1341	W	STT & VS	3	X	X	X						
9	Conc Water	12:19	W	STT	1	X	X							
10	FP Crib	12:12	W	STT	1	X	X							
11	OldAdmin	12:04	W	STT	1	X	X							
12	Conc Crib	12:26	W	STT & VS	3	X	X	X						
13	Weir	11:43	W	STT	1				X					MICRO LAB
				TOTAL	21	12	12	4	1					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; U = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

APPENDIX G – LABORATORY TEST RESULTS

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1731925**	Page	: 1 of 22
Amendment	: **1**		
Client	: **SMEC TESTING SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SMEC TESTING ALL RESULTS	Contact	: Customer Services ES
Address	: P O BOX 6989 WETHERILL PARK NSW, AUSTRALIA 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 21649	Date Samples Received	: 14-Dec-2017 16:02
Order number	: E-2017-713	Date Analysis Commenced	: 18-Dec-2017
C-O-C number	: ----	Issue Date	: 18-Jan-2018 11:34
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 36		
No. of samples analysed	: 31		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- Amendment (18/01/2018): This report has been amended and re-released to remove reporting of samples Trip 1 and Trip 2.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
  Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S7/2-1	21649/S8-1	21649/S8-2	21649/S8-3	21649/S8-4
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-001	ES1731925-004	ES1731925-005	ES1731925-006	ES1731925-007
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	6.1	6.2	8.7	8.7
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	76	155	997	1120
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	9.6	8.8	10.5	----	14.8
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	----	----	----
Asbestos Type	1332-21-4	-	--	----	-	----	----	----
Sample weight (dry)	----	0.01	g	----	218	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	S.SPOONER	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	<0.0004	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	<0.001	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	----	0.218	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	----	<0.0004	----	----	----
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	----	----	----	----	10.9
Exchangeable Magnesium	----	0.2	meq/100g	----	----	----	----	10.8
Exchangeable Potassium	----	0.2	meq/100g	----	----	----	----	<0.2
Exchangeable Sodium	----	0.2	meq/100g	----	----	----	----	1.5
Cation Exchange Capacity	----	0.2	meq/100g	----	----	----	----	23.3
Exchangeable Sodium Percent	----	0.2	%	----	----	----	----	6.6
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	9.6	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	7.0	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.2	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	1.9	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	18.7	----	----
Exchangeable Sodium Percent	----	0.1	%	----	----	10.3	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	----	----	10	----	140
EG005T: Total Metals by ICP-AES								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S7/2-1	21649/S8-1	21649/S8-2	21649/S8-3	21649/S8-4
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-001	ES1731925-004	ES1731925-005	ES1731925-006	ES1731925-007
					Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued									
Arsenic	7440-38-2	5	mg/kg		<5	**10**	**11**	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		**11**	**14**	**18**	----	----
Copper	7440-50-8	5	mg/kg		**24**	**13**	**14**	----	----
Lead	7439-92-1	5	mg/kg		**14**	**17**	**15**	----	----
Nickel	7440-02-0	2	mg/kg		**11**	**7**	**8**	----	----
Zinc	7440-66-6	5	mg/kg		**29**	**22**	**18**	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Total Chlordane (sum)**	----	0.05	mg/kg		<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	<0.05	----	----	----
^ **Endosulfan (sum)**	115-29-7	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	<0.2	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S7/2-1	21649/S8-1	21649/S8-2	21649/S8-3	21649/S8-4
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-001	ES1731925-004	ES1731925-005	ES1731925-006	ES1731925-007
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**74.4**	**119**	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**70.5**	**84.1**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S8-5	21649/S8-6	21649/S8-7	21649/S8-8	21649/S9-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-008	ES1731925-009	ES1731925-010	ES1731925-011	ES1731925-012
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.7	9.2	9.1	8.8	5.4
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	944	666	736	570	430
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	16.3	----	11.1	----	11.9
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	5.4	----	4.4	----	----
Exchangeable Magnesium	----	0.2	meq/100g	10.2	----	7.8	----	----
Exchangeable Potassium	----	0.2	meq/100g	0.2	----	<0.2	----	----
Exchangeable Sodium	----	0.2	meq/100g	2.4	----	1.2	----	----
Cation Exchange Capacity	----	0.2	meq/100g	18.2	----	13.5	----	----
Exchangeable Sodium Percent	----	0.2	%	13.4	----	9.0	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	120	----	110	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S8-5	21649/S8-6	21649/S8-7	21649/S8-8	21649/S9-1
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-008	ES1731925-009	ES1731925-010	ES1731925-011	ES1731925-012
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	<0.2
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		----	----	----	----	<0.05
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	**119**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	**82.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S10-1-1	21649/S11-1	21649/S12/1-1	21649/S13/1-1	21649/S14/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-013	ES1731925-014	ES1731925-015	ES1731925-016	ES1731925-018
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	6.3	6.0	6.7	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	----	155	87	58	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	8.4	11.6	8.1	----	7.8
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	----	No
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	----	----	No
Asbestos Type	1332-21-4	-	--	----	-	----	----	-
Sample weight (dry)	----	0.01	g	----	156	----	----	137
APPROVED IDENTIFIER:	----	-	--	----	S.SPOONER	----	----	S.SPOONER
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	<0.0004	----	----	<0.0004
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	<0.001	----	----	<0.001
ø Weight Used for % Calculation	----	0.0001	kg	----	0.156	----	----	0.137
ø Fibrous Asbestos >7mm	----	0.0004	g	----	<0.0004	----	----	<0.0004
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	13.0	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	3.6	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	0.2	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	0.2	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	17.1	----
Exchangeable Sodium Percent	----	0.1	%	----	----	----	1.4	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	9	8	----	16
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg	----	13	23	----	24
Copper	7440-50-8	5	mg/kg	----	16	13	----	26
Lead	7439-92-1	5	mg/kg	----	24	21	----	41
Nickel	7440-02-0	2	mg/kg	----	6	7	----	12
Zinc	7440-66-6	5	mg/kg	----	39	37	----	110
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	<0.1	----	<0.1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S10-1-1	21649/S11-1	21649/S12/1-1	21649/S13/1-1	21649/S14/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-013	ES1731925-014	ES1731925-015	ES1731925-016	ES1731925-018
				Result	Result	Result	Result	Result
EK072: Phosphate Sorption Capacity								
Phosphate Sorption Capacity	----	250	mg P sorbed/kg	----	----	----	766	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S10-1-1	21649/S11-1	21649/S12/1-1	21649/S13/1-1	21649/S14/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-013	ES1731925-014	ES1731925-015	ES1731925-016	ES1731925-018
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued								
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	**118**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	**83.9**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S14/1-2	21649/S15-1	21649/S15-2	21649/S15-3	21649/S15-4
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-019	ES1731925-020	ES1731925-021	ES1731925-022	ES1731925-023
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.9	6.4	6.4	8.8	8.5
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	100	87	112	446	350
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	10.3	11.8	16.2	13.7	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	----	----	----
Asbestos Type	1332-21-4	-	--	----	-	----	----	----
Sample weight (dry)	----	0.01	g	----	126	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	S.SPOONER	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	<0.0004	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	<0.001	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	----	0.126	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	----	<0.0004	----	----	----
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	----	----	----	16.9	----
Exchangeable Magnesium	----	0.2	meq/100g	----	----	----	13.4	----
Exchangeable Potassium	----	0.2	meq/100g	----	----	----	<0.2	----
Exchangeable Sodium	----	0.2	meq/100g	----	----	----	2.7	----
Cation Exchange Capacity	----	0.2	meq/100g	----	----	----	33.0	----
Exchangeable Sodium Percent	----	0.2	%	----	----	----	8.2	----
ED007: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	6.2	----	10.5	----	----
Exchangeable Magnesium	----	0.1	meq/100g	9.4	----	9.4	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.1	----	0.2	----	----
Exchangeable Sodium	----	0.1	meq/100g	2.0	----	3.0	----	----
Cation Exchange Capacity	----	0.1	meq/100g	17.7	----	23.1	----	----
Exchangeable Sodium Percent	----	0.1	%	11.5	----	12.9	----	----
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	----	----	90	120	----
EG005T: Total Metals by ICP-AES								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S14/1-2	21649/S15-1	21649/S15-2	21649/S15-3	21649/S15-4
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-019	ES1731925-020	ES1731925-021	ES1731925-022	ES1731925-023
					Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued									
Arsenic	7440-38-2	5	mg/kg		**15**	**12**	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		**19**	**18**	----	----	----
Copper	7440-50-8	5	mg/kg		**31**	**21**	----	----	----
Lead	7439-92-1	5	mg/kg		**20**	**68**	----	----	----
Nickel	7440-02-0	2	mg/kg		**52**	**14**	----	----	----
Zinc	7440-66-6	5	mg/kg		**124**	**55**	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EK072: Phosphate Sorption Capacity									
Phosphate Sorption Capacity	----	250	mg P sorbed/kg		**1090**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S15-5	21649/S15-6	21649/S15-7	21649/S15-8	21649/S16/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-024	ES1731925-025	ES1731925-026	ES1731925-027	ES1731925-028
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	**8.7**	**8.6**	**9.1**	**9.5**	**----**
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	**192**	**224**	**240**	**337**	**----**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**9.6**	**10.6**	**----**	**----**	**7.7**
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**----**	**----**	**----**	**----**	**No**
Asbestos (Trace)	1332-21-4	5	Fibres	**----**	**----**	**----**	**----**	**No**
Asbestos Type	1332-21-4	-	--	**----**	**----**	**----**	**----**	**-**
Sample weight (dry)	----	0.01	g	**----**	**----**	**----**	**----**	**317**
APPROVED IDENTIFIER:	----	-	--	**----**	**----**	**----**	**----**	**S.SPOONER**
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	**----**	**----**	**----**	**----**	<0.0004
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	**----**	**----**	**----**	**----**	<0.001
ø Weight Used for % Calculation	----	0.0001	kg	**----**	**----**	**----**	**----**	**0.317**
ø Fibrous Asbestos >7mm	----	0.0004	g	**----**	**----**	**----**	**----**	<0.0004
ED006: Exchangeable Cations on Alkaline Soils								
Exchangeable Calcium	----	0.2	meq/100g	**21.1**	**18.0**	**----**	**----**	**----**
Exchangeable Magnesium	----	0.2	meq/100g	**9.8**	**8.4**	**----**	**----**	**----**
Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	**----**	**----**	**----**
Exchangeable Sodium	----	0.2	meq/100g	<0.2	<0.2	**----**	**----**	**----**
Cation Exchange Capacity	----	0.2	meq/100g	**30.9**	**26.5**	**----**	**----**	**----**
Exchangeable Sodium Percent	----	0.2	%	<0.2	<0.2	**----**	**----**	**----**
ED040S : Soluble Sulfate by ICPAES								
Sulfate as SO4 2-	14808-79-8	10	mg/kg	**10**	**20**	**----**	**----**	**----**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**----**	**----**	**----**	**----**	**16**
Cadmium	7440-43-9	1	mg/kg	**----**	**----**	**----**	**----**	<1
Chromium	7440-47-3	2	mg/kg	**----**	**----**	**----**	**----**	**26**
Copper	7440-50-8	5	mg/kg	**----**	**----**	**----**	**----**	**15**
Lead	7439-92-1	5	mg/kg	**----**	**----**	**----**	**----**	**28**
Nickel	7440-02-0	2	mg/kg	**----**	**----**	**----**	**----**	**8**
Zinc	7440-66-6	5	mg/kg	**----**	**----**	**----**	**----**	**40**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S15-5	21649/S15-6	21649/S15-7	21649/S15-8	21649/S16/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-024	ES1731925-025	ES1731925-026	ES1731925-027	ES1731925-028
				Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	----	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	----	----	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	----	<0.2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S15-5	21649/S15-6	21649/S15-7	21649/S15-8	21649/S16/1-1
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-024	ES1731925-025	ES1731925-026	ES1731925-027	ES1731925-028
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		----	----	----	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	----	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	----	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		----	----	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	----	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		----	----	----	----	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	----	----	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	----	----	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	----	----	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	----	----	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S15-5	21649/S15-6	21649/S15-7	21649/S15-8	21649/S16/1-1
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-024	ES1731925-025	ES1731925-026	ES1731925-027	ES1731925-028
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.5	mg/kg	----	----	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	----	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	----	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	----	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	----	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	----	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	----	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	----	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	----	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	----	----	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	----	----	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	----	----	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	----	----	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	----	----	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	----	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	----	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg	----	----	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	----	----	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	----	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	----	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	----	----	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	----	----	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	----	----	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S15-5	21649/S15-6	21649/S15-7	21649/S15-8	21649/S16/1-1
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-024	ES1731925-025	ES1731925-026	ES1731925-027	ES1731925-028
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	----	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	----	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	----	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	----	----	----	<0.2
^ Total Xylenes	----	0.5	mg/kg		----	----	----	----	<0.5
Naphthalene	91-20-3	1	mg/kg		----	----	----	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	----	----	114
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	----	116
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	----	120
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	----	----	83.8
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	----	----	84.0
2.4.6-Tribromophenol	118-79-6	0.5	%		----	----	----	----	87.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	----	----	94.5
Anthracene-d10	1719-06-8	0.5	%		----	----	----	----	99.2
4-Terphenyl-d14	1718-51-0	0.5	%		----	----	----	----	91.0
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		----	----	----	----	116
Toluene-D8	2037-26-5	0.2	%		----	----	----	----	125
4-Bromofluorobenzene	460-00-4	0.2	%		----	----	----	----	120

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	21649/S17/1	21649/S18/1-1	21649/S19/1-1	DUP 1	DUP 2
			Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit	ES1731925-029	ES1731925-030	ES1731925-031	ES1731925-035	ES1731925-036
				Result	Result	Result	Result	Result
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.9	----	6.0	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	37	----	46	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	----	8.6	----	10.4	10.1
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	----	No	----	----	----
Asbestos Type	1332-21-4	-	--	----	-	----	----	----
Sample weight (dry)	----	0.01	g	----	223	----	----	----
APPROVED IDENTIFIER:	----	-	--	----	S.SPOONER	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	----	<0.0004	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	----	<0.001	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	----	0.223	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	----	<0.0004	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	11	----	----	10
Cadmium	7440-43-9	1	mg/kg	----	<1	----	----	<1
Chromium	7440-47-3	2	mg/kg	----	28	----	----	21
Copper	7440-50-8	5	mg/kg	----	15	----	----	18
Lead	7439-92-1	5	mg/kg	----	26	----	----	20
Nickel	7440-02-0	2	mg/kg	----	7	----	----	10
Zinc	7440-66-6	5	mg/kg	----	38	----	----	43
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S17/1	21649/S18/1-1	21649/S19/1-1	DUP 1	DUP 2
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-029	ES1731925-030	ES1731925-031	ES1731925-035	ES1731925-036
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
Aldrin	309-00-2	0.05	mg/kg		----	----	----	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	<0.05	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	----	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg		----	----	----	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg		----	----	----	<0.05	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	<0.05	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	----	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg		----	----	----	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg		----	----	----	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	<0.2	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		----	----	----	<0.05	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		----	----	----	<0.05	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg		----	----	----	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg		----	----	----	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg		----	----	----	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg		----	----	----	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	<0.05	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	21649/S17/1	21649/S18/1-1	21649/S19/1-1	DUP 1	DUP 2
				Client sampling date / time	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00	14-Dec-2017 00:00
Compound	CAS Number	LOR	Unit		ES1731925-029	ES1731925-030	ES1731925-031	ES1731925-035	ES1731925-036
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg		----	----	----	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	<0.05	<0.05
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	----	**119**	**98.6**
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	----	**119**	**116**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	DUP 3	----	----	----	----
				Client sampling date / time	14-Dec-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1731925-037	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**14.0**	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**13**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**20**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**18**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**18**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**9**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**44**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	21649/S8-1 - 14-Dec-2017 00:00	Mid brown clay soil.
EA200: Description	21649/S11-1 - 14-Dec-2017 00:00	Mid brown clay soil.
EA200: Description	21649/S14/1-1 - 14-Dec-2017 00:00	Mid brown clay soil.
EA200: Description	21649/S15-1 - 14-Dec-2017 00:00	Mid brown clay soil.
EA200: Description	21649/S16/1-1 - 14-Dec-2017 00:00	Mid brown clay soil.
EA200: Description	21649/S18/1-1 - 14-Dec-2017 00:00	Mid brown clay soil.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1731925**	Page	: 1 of 17
Amendment	: **1**		
Client	: **SMEC TESTING SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SMEC TESTING ALL RESULTS	Contact	: Customer Services ES
Address	: P O BOX 6989 WETHERILL PARK NSW, AUSTRALIA 2164	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 21649	Date Samples Received	: 14-Dec-2017
Order number	: E-2017-713	Date Analysis Commenced	: 18-Dec-2017
C-O-C number	: ----	Issue Date	: 18-Jan-2018
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 36		
No. of samples analysed	: 31		

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

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dian Dao		Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA002 : pH (Soils) (QC Lot: 1324704)									
ES1731925-015	21649/S12/1-1	EA002: pH Value	----	0.1	pH Unit	6.0	5.9	0.00	0% - 20%
ES1731925-010	21649/S8-7	EA002: pH Value	----	0.1	pH Unit	9.1	9.2	0.00	0% - 20%
EA002 : pH (Soils) (QC Lot: 1324707)									
ES1731925-027	21649/S15-8	EA002: pH Value	----	0.1	pH Unit	9.5	9.6	0.00	0% - 20%
ES1731937-009	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.2	7.3	1.66	0% - 20%
EA010: Conductivity (QC Lot: 1324703)									
ES1731925-015	21649/S12/1-1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	87	83	4.60	0% - 20%
ES1731925-010	21649/S8-7	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	736	695	5.73	0% - 20%
EA010: Conductivity (QC Lot: 1324706)									
ES1731925-027	21649/S15-8	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	337	338	0.296	0% - 20%
ES1731937-009	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	693	679	2.04	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1328473)									
ES1731894-023	Anonymous	EA055: Moisture Content	----	1	%	20.9	21.1	0.827	0% - 20%
ES1731925-007	21649/S8-4	EA055: Moisture Content	----	1	%	14.8	15.3	3.07	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1328474)									
ES1731925-020	21649/S15-1	EA055: Moisture Content	----	1	%	11.8	11.2	5.04	0% - 50%
ES1731937-006	Anonymous	EA055: Moisture Content	----	1	%	12.7	15.5	20.0	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1334636)									
EP1714301-014	Anonymous	EA055: Moisture Content	----	1	%	20.3	20.1	1.19	0% - 20%
ES1732127-003	Anonymous	EA055: Moisture Content	----	1	%	2.8	2.7	0.00	No Limit
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1338337)									
ES1731925-007	21649/S8-4	ED006: Exchangeable Sodium Percent	----	0.2	%	6.6	6.8	2.74	0% - 20%
		ED006: Exchangeable Calcium	----	0.2	meq/100g	10.9	11.0	1.00	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1338337) - continued									
ES1731925-007	21649/S8-4	ED006: Exchangeable Magnesium	----	0.2	meq/100g	10.8	11.0	1.41	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	1.5	1.6	0.00	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	23.3	23.6	1.40	0% - 20%
ES1732206-005	Anonymous	ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	<0.2	0.00	No Limit
		ED006: Exchangeable Calcium	----	0.2	meq/100g	9.8	9.9	1.16	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	2.5	2.5	0.00	0% - 50%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	1.6	1.6	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	<0.2	0.00	No Limit
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	13.9	14.1	1.20	0% - 20%
ED007: Exchangeable Cations (QC Lot: 1338339)									
ES1731925-005	21649/S8-2	ED007: Exchangeable Sodium Percent	----	0.1	%	10.3	10.3	0.00	0% - 20%
		ED007: Exchangeable Calcium	----	0.1	meq/100g	9.6	9.2	4.37	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	7.0	6.8	3.34	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	1.9	1.8	0.00	0% - 50%
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	18.7	18.0	3.94	0% - 20%
ES1732050-083	Anonymous	ED007: Exchangeable Sodium Percent	----	0.1	%	0.6	0.6	0.00	No Limit
		ED007: Exchangeable Calcium	----	0.1	meq/100g	3.6	3.4	3.34	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.4	0.4	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	4.1	3.9	3.23	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 1324705)									
ES1731925-010	21649/S8-7	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	110	100	0.00	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1327704)									
ES1731283-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1731925-019	21649/S14/1-2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	21	7.88	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	52	53	0.00	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	15	15	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	31	30	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	21	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	124	121	2.77	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1331093)									
ES1731808-067	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	15	12	15.9	No Limit
ES1732350-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	9	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	17	18	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	84	90	6.78	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	127	118	7.88	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	174	158	9.76	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1327705)									
ES1731283-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1731925-019	21649/S14/1-2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1331092)									
ES1731808-067	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1732350-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EK072: Phosphate Sorption Capacity (QC Lot: 1322542)									
ES1731925-016	21649/S13/1-1	EK072: Phosphate Sorption Capacity	----	250	mg P sorbed/kg	766	634	18.8	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 1323257)									
ES1731925-028	21649/S16/1-1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1323256)									
ES1731937-013	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1323256) - continued									
ES1731937-013	Anonymous	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1731925-028	21649/S16/1-1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1331029)									
ES1732196-003	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 1331029) - continued									
ES1732196-003	Anonymous	EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1323256)									
ES1731937-013	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1731925-028	21649/S16/1-1	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1323256) - continued									
ES1731925-028	21649/S16/1-1	EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 1331029)									
ES1732196-003	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1323259)									
ES1731925-028	21649/S16/1-1	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1323259) - continued									
ES1731925-028	21649/S16/1-1	EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1323259)									
ES1731925-028	21649/S16/1-1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1323258)									
ES1731925-028	21649/S16/1-1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1326865)									
ES1732011-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EW1705287-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1323258)									
ES1731925-028	21649/S16/1-1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1326865)									
ES1732011-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EW1705287-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 1326865)									
ES1732011-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 1326865) - continued									
ES1732011-001	Anonymous	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EW1705287-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA010: Conductivity (QCLot: 1324703)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	98.0	92	108
EA010: Conductivity (QCLot: 1324706)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	98.3	92	108
ED006: Exchangeable Cations on Alkaline Soils (QCLot: 1338337)								
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	2.5 meq/100g	93.0	80	110
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	4.17 meq/100g	102	80	110
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	1.28 meq/100g	105	80	110
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	2.17 meq/100g	105	80	110
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	----	----	----	----
ED006: Exchangeable Sodium Percent	----	0.2	%	<0.2	----	----	----	----
ED007: Exchangeable Cations (QCLot: 1338339)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	92.0	76	120
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	87.4	75	115
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	108	80	120
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	89.6	80	120
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	----	----	----	----
ED040S: Soluble Major Anions (QCLot: 1324705)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	150 mg/kg	99.1	80	120
EG005T: Total Metals by ICP-AES (QCLot: 1327704)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	92.1	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	90.3	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	81.0	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	95.9	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	86.5	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	93.8	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	83.1	80	122
EG005T: Total Metals by ICP-AES (QCLot: 1331093)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	89.8	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	90.1	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	86.4	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	92.2	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	92.8	80	114

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1331093) - continued								
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	94.2	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	97.5	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1327705)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	87.9	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1331092)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	82.6	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1323257)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	97.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 1323256)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.2	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	95.7	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.4	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.5	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	81.1	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	82.3	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.3	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	81.2	54	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1331029)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	110	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	111	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	115

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 1331029) - continued								
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	109	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	108	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	101	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.0	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.4	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	113	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	79.3	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	102	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	74.8	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1323256)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	81.9	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.6	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	92.8	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	94.3	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	90.2	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.8	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	72.1	41	123
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1331029)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	117	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	95.4	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.9	67	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1331029) - continued								
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	97.6	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	110	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	97.7	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	100	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	105	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	106	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	82.1	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	106	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.3	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	100	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	88.3	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	52.9	41	123
EP075(SIM)A: Phenolic Compounds (QCLot: 1323259)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	99.3	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	102	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	107	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	110	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	91.4	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	96.4	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	104	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	106	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	100	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	92.7	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	93.3	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	14.4	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1323259)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	114	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	113	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	110	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	122	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	118	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	122	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	101	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	117	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	112	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	114	75	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1323259) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	107	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	116	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	112	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	105	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	108	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	103	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1323258)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	105	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	105	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	107	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1326865)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1323258)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	100	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	104	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1326865)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	104	68	128
EP080: BTEXN (QCLot: 1326865)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	96.5	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	95.6	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.7	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	95.0	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.6	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.9	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 1327704)							
ES1731283-009	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.7	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1327704) - continued							
ES1731283-009	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	80.3	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	95.9	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.6	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.3	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1331093)							
ES1731808-067	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	91.9	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.9	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.4	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	91.6	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.1	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	91.6	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1327705)							
ES1731283-009	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	91.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1331092)							
ES1731808-067	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.5	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 1323257)							
ES1731925-028	21649/S16/1-1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	101	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1323256)							
ES1731925-028	21649/S16/1-1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	104	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	76.4	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	97.4	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	106	70	130
		EP068: Endrin	72-20-8	2 mg/kg	99.4	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	75.4	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 1331029)							
ES1732196-003	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	108	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	108	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	81.0	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	108	70	130
		EP068: Endrin	72-20-8	2 mg/kg	97.1	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	85.2	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1323256)							
ES1731925-028	21649/S16/1-1	EP068: Diazinon	333-41-5	0.5 mg/kg	101	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	97.1	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	96.3	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1323256) - continued							
ES1731925-028	21649/S16/1-1	EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	93.6	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	90.0	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 1331029)							
ES1732196-003	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	102	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	107	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	109	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	109	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	106	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1323259)							
ES1731925-028	21649/S16/1-1	EP075(SIM): Phenol	108-95-2	10 mg/kg	102	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	105	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	94.7	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	94.9	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	40.3	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1323259)							
ES1731925-028	21649/S16/1-1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	130	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1323258)							
ES1731925-028	21649/S16/1-1	EP071: C10 - C14 Fraction	----	523 mg/kg	80.0	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	104	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	124	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1326865)							
ES1732011-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1323258)							
ES1731925-028	21649/S16/1-1	EP071: >C10 - C16 Fraction	----	860 mg/kg	87.5	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	118	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	116	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1326865)							
ES1732011-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	115	70	130
EP080: BTEXN (QCLot: 1326865)							
ES1732011-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	127	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	113	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	114	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	115	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	116	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 1326865) - continued							
ES1732011-001	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	108	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1731925**	Page	: 1 of 9
Amendment	: **1**		
Client	: **SMEC TESTING SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: SMEC TESTING ALL RESULTS	Telephone	: +61-2-8784 8555
Project	: 21649	Date Samples Received	: 14-Dec-2017
Site	: ----	Issue Date	: 18-Jan-2018
Sampler	: ----	No. of samples received	: 36
Order number	: E-2017-713	No. of samples analysed	: 31

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Major Anions - Soluble	1	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA002 : pH (Soils)							
Soil Glass Jar - Unpreserved (EA002)							
21649/S8-1, 21649/S8-2, 21649/S8-3, 21649/S8-4, 21649/S8-5, 21649/S8-6, 21649/S8-7, 21649/S8-8, 21649/S9-1, 21649/S11-1, 21649/S12/1-1, 21649/S13/1-1, 21649/S14/1-2, 21649/S15-1, 21649/S15-2, 21649/S15-3, 21649/S15-4, 21649/S15-5, 21649/S15-6, 21649/S15-7, 21649/S15-8, 21649/S17/1, 21649/S19/1-1	**14-Dec-2017**	**19-Dec-2017**	21-Dec-2017	✓	**19-Dec-2017**	19-Dec-2017	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010)							
21649/S8-1, 21649/S8-2, 21649/S8-3, 21649/S8-4, 21649/S8-5, 21649/S8-6, 21649/S8-7, 21649/S8-8, 21649/S9-1, 21649/S11-1, 21649/S12/1-1, 21649/S13/1-1, 21649/S14/1-2, 21649/S15-1, 21649/S15-2, 21649/S15-3, 21649/S15-4, 21649/S15-5, 21649/S15-6, 21649/S15-7, 21649/S15-8, 21649/S17/1, 21649/S19/1-1	**14-Dec-2017**	**19-Dec-2017**	21-Dec-2017	✓	**19-Dec-2017**	16-Jan-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
21649/S7/2-1, 21649/S8-1, 21649/S8-2, 21649/S8-4, 21649/S8-5, 21649/S8-7, 21649/S9-1, 21649/S10-1-1, 21649/S11-1, 21649/S12/1-1, 21649/S14/1-1, 21649/S14/1-2, 21649/S15-1, 21649/S15-2, 21649/S15-3, 21649/S15-5, 21649/S15-6, 21649/S16/1-1, 21649/S18/1-1	**14-Dec-2017**	**----**	----	----	**19-Dec-2017**	28-Dec-2017	✓
Soil Glass Jar - Unpreserved (EA055)							
DUP 1, DUP 2, DUP 3	**14-Dec-2017**	**----**	----	----	**21-Dec-2017**	28-Dec-2017	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200)							
21649/S8-1, 21649/S11-1, 21649/S14/1-1, 21649/S15-1, 21649/S16/1-1, 21649/S18/1-1	**14-Dec-2017**	**----**	----	----	**19-Dec-2017**	12-Jun-2018	✓
EA200N: Asbestos Quantification (non-NATA)							
Snap Lock Bag: Separate bag received (EA200N)							
21649/S8-1, 21649/S11-1, 21649/S14/1-1, 21649/S15-1, 21649/S16/1-1, 21649/S18/1-1	**14-Dec-2017**	**----**	----	----	**19-Dec-2017**	12-Jun-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED006: Exchangeable Cations on Alkaline Soils							
Soil Glass Jar - Unpreserved (ED006)							
21649/S8-4, 21649/S8-5, 21649/S8-7, 21649/S15-3, 21649/S15-5, 21649/S15-6	**14-Dec-2017**	**22-Dec-2017**	11-Jan-2018	✓	**22-Dec-2017**	11-Jan-2018	✓
ED007: Exchangeable Cations							
Soil Glass Jar - Unpreserved (ED007)							
21649/S8-2, 21649/S13/1-1, 21649/S14/1-2, 21649/S15-2	**14-Dec-2017**	**22-Dec-2017**	11-Jan-2018	✓	**22-Dec-2017**	11-Jan-2018	✓
ED040S : Soluble Sulfate by ICPAES							
Soil Glass Jar - Unpreserved (ED040S)							
21649/S8-2, 21649/S8-4, 21649/S8-5, 21649/S8-7, 21649/S15-2, 21649/S15-3, 21649/S15-5, 21649/S15-6	**14-Dec-2017**	**19-Dec-2017**	11-Jan-2018	✓	**19-Dec-2017**	16-Jan-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
21649/S7/2-1, 21649/S8-1, 21649/S8-2, 21649/S11-1, 21649/S12/1-1, 21649/S14/1-1, 21649/S14/1-2, 21649/S15-1, 21649/S16/1-1, 21649/S18/1-1	**14-Dec-2017**	**19-Dec-2017**	12-Jun-2018	✓	**19-Dec-2017**	12-Jun-2018	✓
Soil Glass Jar - Unpreserved (EG005T)							
DUP 2, DUP 3	**14-Dec-2017**	**20-Dec-2017**	12-Jun-2018	✓	**21-Dec-2017**	12-Jun-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
21649/S7/2-1, 21649/S8-1, 21649/S8-2, 21649/S11-1, 21649/S12/1-1, 21649/S14/1-1, 21649/S14/1-2, 21649/S15-1, 21649/S16/1-1, 21649/S18/1-1	**14-Dec-2017**	**19-Dec-2017**	11-Jan-2018	✓	**20-Dec-2017**	11-Jan-2018	✓
Soil Glass Jar - Unpreserved (EG035T)							
DUP 2, DUP 3	**14-Dec-2017**	**20-Dec-2017**	11-Jan-2018	✓	**21-Dec-2017**	11-Jan-2018	✓
EK072: Phosphate Sorption Capacity							
Soil Glass Jar - Unpreserved (EK072)							
21649/S13/1-1, 21649/S14/1-2	**14-Dec-2017**	**----**	----	----	**18-Dec-2017**	12-Jun-2018	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066)							
21649/S16/1-1	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	30-Jan-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
21649/S7/2-1, 21649/S8-1, 21649/S9-1, 21649/S10-1-1, 21649/S16/1-1, DUP 1, DUP 2	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	30-Jan-2018	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068)							
21649/S7/2-1, 21649/S8-1, 21649/S9-1, 21649/S10-1-1, 21649/S16/1-1, DUP 1, DUP 2	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**22-Dec-2017**	30-Jan-2018	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
21649/S16/1-1	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	30-Jan-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
21649/S16/1-1	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	30-Jan-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
21649/S16/1-1	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**20-Dec-2017**	28-Dec-2017	✓
Soil Glass Jar - Unpreserved (EP071)							
21649/S16/1-1	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	30-Jan-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
21649/S16/1-1	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**20-Dec-2017**	28-Dec-2017	✓
Soil Glass Jar - Unpreserved (EP071)							
21649/S16/1-1	**14-Dec-2017**	**21-Dec-2017**	28-Dec-2017	✓	**21-Dec-2017**	30-Jan-2018	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
21649/S16/1-1	**14-Dec-2017**	**20-Dec-2017**	28-Dec-2017	✓	**20-Dec-2017**	28-Dec-2017	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Electrical Conductivity (1:5)	EA010	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	12	**8.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
P Sorption Index & P Sorption Capacity	EK072	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	3	24	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	4	36	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	33	**12.12**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Electrical Conductivity (1:5)	EA010	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Electrical Conductivity (1:5)	EA010	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	24	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Exchangeable Cations on Alkaline Soils	ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
P Sorption Index & P Sorption Capacity	EK072	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 9H1 & 9I1 Soil is bought to equilibrium with a solution of P at known concentration. P absorbed, released is determined by FIA analysis of the final solution.
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons 2011 method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH4Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.