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Report Type: Salinity Assessment Report
Site Address: 94 – 100 Explorers Way, St Clair, NSW
Report Number: 1842/ER-1-2
Report Date: 29th April 2015

Prepared for

Silky Property Group
c/o Diversi Consulting
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Prepared by

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29th April 2015

Silky Property Group
c/o Diversi Consulting
PO Box 6662
Baulkham Hills, NSW, 2153

RE: SALINITY ASSESSMENT REPORT – 94 – 100 EXPLORERS WAY, ST CLAIR, NSW

Alliance Geotechnical Pty Ltd (AG) hereby submits this Salinity Assessment Report of the above site.

This report documents the findings of all completed environmental tasks, including reviews of site setting information, site works and soil sample collection to assess salinity, aggressivity and sodicity. Based on field observations and laboratory data, conclusions are drawn regarding the salinity status of the site with recommendations for additional action, if necessary.

Should you require further information or clarification regarding any aspect of this report, please call the undersigned on 9675 1777.

For and on behalf of,
Alliance Geotechnical Pty Ltd

Benjamin Regan
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Alliance Geotechnical Pty Ltd

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EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Diversi Consulting on behalf of Silky Property Group (the client), to conduct a salinity assessment report at 94 – 100 Explorers Way, St Clair, NSW (herein referred to as 'the site'), refer to **Figure 1**. The site is legally identified as Lot 36 in Deposited Plan (DP) 239502 and covered an area of approximately 1.07 hectares (10,700 m^2). The site is currently used for residential and open space land uses and it is understood that the client is planning to sub-divide the site for residential land use. This assessment has been completed in conjunction with a Phase 1 Preliminary Site Investigation as documented separately (AG 2015[1]). This report documents the findings of all completed environmental tasks, including reviews of site setting information, site works and soil sample collection to assess salinity, aggressivity and sodicity. Based on field observations and laboratory data, conclusions are drawn regarding the salinity status of the site with recommendations for additional action, if necessary.

The objective of the assessment was to evaluate soil salinity conditions and identify potential site salinity hazards in relation to future land use(s). The scope of works comprised a desktop review of the site history and site setting information including a review of previous investigations at the site, a detailed site inspection, a soil profile assessment including analysis of selected soil samples for electrical conductivity (EC), exchangeable sodium percentage (ESP), Chlorides, Sulphates, Soil pH and cation exchange capacity (CEC) and data assessment and preparation of a Salinity Assessment Report.

A site inspection was complete on 13th April 2015 by one of AG's trained and experienced environmental consultants. During the site inspection the site was observed to comprise a large open space / backyard (0.67 ha), eight (8) buildings / structures and a gravel driveway. For site photographs, refer to **Appendix A**.

The majority of the site consisted of the open space / backyard which was unused at the time of inspection. The backyard was relatively flat with the exception of a man-made drainage channel which extended from the western boundary, through to the north-eastern boundary. The drainage channel was not expected to have been a former creek bed and had a depth of approximately 0.5 – 1.0 m below the level of the backyard. The down slopes of the embankments were approximately 10 %. An area of small to medium sized, natural and introduced species of trees was observed in the north-western corner and north-eastern corner of the site. No bare patches of soil were observed.

There were no observed occurrences of the following indicators of salinity:

- Bare soil patches;
- Salt crystals on the surface;
- 'Puffiness' of soil when dry, or greasy, on some soils if wet;
- Black staining on some soils;
- Presence of indicator vegetation species;
- Die back of trees; and
- Staining and marking of house foundations.

The sampling density adopted for this investigation was three (3) locations per hectare with two (2) samples per location (i.e. one collected from fill material and one from natural), consistent with DLWC (2002). For the site (approximately 1 hectare) this equated to salinity testing at 3 locations (i.e. 6 samples). Groundwater was not assessed in this investigation. Soil samples were collected via test pits excavated using a backhoe to enable observations of the shallow soil profile and collection of appropriate samples for salinity testing. Soil samples

[1] *Preliminary Site Investigation Report, 94 – 100 Explorers Way, St Clair, NSW (Report Number 1842-ER-1-1)*, Alliance Geotechnical, 28th April 2015 (AG 2015)

were collected at appropriate intervals to enable inspection and testing, with two samples collected per location. During the collection of soil samples, features associated with potential salinity issues was recorded.

Based on the scope of work completed for this assessment and the Limitations included in **Section 7**, it is considered that site soils are not characterised as having an elevated risk with respect to soil salinity and as such, specific management of the site during and/or following development works is not required with respect to soil salinity conditions. The assessment also identified that site soils are considered to be non-aggressive with respect to future steel or concrete foundations and infrastructure. The assessment also identified that soils at the site were non-sodic, hence there was a low risk of erosion hazards.

1.0 INTRODUCTION

1.1 Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Diversi Consulting on behalf of Silky Property Group (the client), to conduct a salinity assessment report at 94 – 100 Explorers Way, St Clair, NSW (herein referred to as 'the site'), refer to **Figure 1**. The site is legally identified as Lot 36 in Deposited Plan (DP) 239502 and covered an area of approximately 1.07 hectares (10,700 m^2).

The site is currently used for residential and open space land uses and it is understood that the client is planning to sub-divide the site for residential land use. This assessment has been completed in conjunction with a Phase 1 Preliminary Site Investigation as documented separately (AG 2015[2]).

This report documents the findings of all completed environmental tasks, including reviews of site setting information, site works and soil sample collection to assess salinity, aggressivity and sodicity. Based on field observations and laboratory data, conclusions are drawn regarding the salinity status of the site with recommendations for additional action, if necessary.

The investigation has been developed in general accordance with the requirements of the NSW Department of Land and Water Conservation (DLWC) and Western Sydney Regional Organisation of Councils (WSROC) published and endorsed guidelines.

1.2 Objective

The objective of the assessment was to evaluate soil salinity conditions and identify potential site salinity hazards in relation to future land use(s).

1.3 Scope of Work

The scope of works comprised:

- A desktop review of the site history and site setting information including a review of previous investigations at the site;
- A detailed site inspection;
- Soil profile assessment including analysis of selected soil samples for electrical conductivity (EC), exchangeable sodium percentage (ESP), Chlorides, Sulphates, Soil pH and cation exchange capacity (CEC); and
- Data assessment and preparation of a Salinity Assessment Report.

[2] *Preliminary Site Investigation Report, 94 – 100 Explorers Way, St Clair, NSW (Report Number 1842-ER-1-1)*, Alliance Geotechnical, 28th April 2015 (AG 2015)

2.0 SITE DESCRIPTION AND SETTING

2.1 Site Location and Identification

The site was located at 94 – 100 Explorers Way, St Clair, NSW (Ref. **Figure 1**). It was further identified as comprising Lot 36 in Deposited Plan (DP) 239502. The site was an approximately rectangular shaped parcel of land, covering an area of approximately 1.07 hectares (refer to **Figure 2**). The approximate geographic coordinates of the site were -33.791522 E, 150.801251 N.

2.2 Site Inspection

A site inspection was complete on 13th April 2015 by one of AG's trained and experienced environmental consultants. During the site inspection the site was observed to comprise a large open space / backyard (0.67 ha), eight (8) buildings / structures and a gravel driveway. For site photographs, refer to **Appendix A**.

The majority of the site consisted of the open space / backyard which was unused at the time of inspection. The backyard was relatively flat with the exception of a man-made drainage channel which extended from the western boundary, through to the north-eastern boundary. The drainage channel was not expected to have been a former creek bed and had a depth of approximately 0.5 – 1.0 m below the level of the backyard. The down slopes of the embankments were approximately 10 %. An area of small to medium sized, natural and introduced species of trees was observed in the north-western corner and north-eastern corner of the site. No bare patches of soil were observed.

The buildings / structures at the site included:

- A large two-storey, residential dwelling, located in the south-eastern corner of the site;
- An outdoor dining area / gazebo, located approximately 20 m north of the large dwelling;
- A small hut, located in between the gazebo and large dwelling. The ground surface in the area between the large dwelling, gazebo and hut was covered with a concrete slab;
- Two small, single-storey dwellings, in the southern portion of the site;
- A chicken coop, located approximately 10 m to the north of the small dwellings; and
- Two small sheds, located on the eastern boundary of the site.

Three (3) test pits were excavated during the investigation with fill material observed in the area north of the small dwellings and gazebo (TP1) and the raised area to the south of the drainage channel (TP2). Fill material was observed to range in depth from the surface (0.0 m below ground surface (bgs)) to 0.5 – 0.6 m bgs and was described as silty clay, brown, dry to damp, soft to firm with moderate plasticity and minor inclusions of bricks, concrete fragments, rubber, PVC pipe, glass, plastic and charcoal. Refer to **Appendix B** for lithological logs.

There were no observed occurrences of the following indicators of salinity:

- Bare soil patches;
- Salt crystals on the surface;
- 'Puffiness' of soil when dry, or greasy, on some soils if wet;
- Black staining on some soils;
- Presence of indicator vegetation species;
- Die back of trees; and
- Staining and marking of house foundations.

Inaccessible areas at the time of inspection included within the site buildings, the soils in the areas of building footprints and soils in other sealed areas of the site.

2.3 Surrounding Areas

The site was bound by:

- A vegetated area / riparian zone to the north, beyond which was the M4 Motorway;
- Low density residential land use to the east;
- Explorers Way to the south, beyond which was low density residential land use; and
- Low density residential land use and open space / parkland to the west.

2.4 Topography and Site Drainage

The site was located on a relatively flat gradient (< 5%) in a north-easterly direction. Information on regional topographic conditions, referenced from the Central Mapping Authority of NSW Penrith 9130 Topographic Map 1:25,000 (CMA, 1986), was consistent with this description and indicated that the property's elevation was approximately 50 – 60 m above sea level (i.e. 50 – 60 m Australian Height Datum (AHD)).

Due to the majority of the site being unsealed, precipitation is anticipated to infiltrate the ground surface until it reaches saturation point and then flow along the surface towards the drainage channel and corresponding stormwater pits in the centre of the site. The stormwater channel is grassed, however during periods of heavy rainfall, precipitation is anticipated to flow through the channel to the north-east. In sealed areas of the site, precipitation is anticipated to be captured by the building gutters and site stormwater drainage system.

The nearest surface water receptor was the unnamed stormwater channel in the centre of the site. The channel extends from the centre of the western boundary of the site, through the centre of the site and exits at the north-eastern boundary of the site. Any stormwater from the site is anticipated to enter the M4 Motorway Stormwater system which is likely to drain into Ropes Creek, approximately 900 m to the east. Runoff and groundwater at the site is likely to find its way to this system.

2.5 Regional Geology and Soil Landscape

Information on regional sub-surface conditions, referenced from the Geological Survey of NSW / Department of Mineral Resources Penrith 1:100,000 Geological Series Sheet 9130 (GS NSW / DMR, 1983), indicated that the site overlies Wianamatta Group Bringelly Shale (Rwb). These soils are anticipated to comprise shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff.

Review of the NSW National Resource Atlas Acid Sulfate Soil Risk Maps indicated that the site overlies an area of "no known occurrence of acid sulphate soils". There is not anticipated to be a risk to current or future site buildings from acid sulphate soils.

2.6 Hydrogeology

A review of the NSW Office of Water groundwater database indicated that no registered groundwater bores were located within a 1.5 km radius of the site. Groundwater bore information was supplied by the NSW Office of Water and is attached in **Appendix C**. No conclusions were able to be made regarding groundwater at the site.

2.7 Salinity

A review of the NSW Department of Infrastructure, Planning and Natural Resources 'Salinity Potential in Western Sydney 2002 Map' (DIPNR 2002) indicated that the site was located in an area of moderate salinity potential.

The soil landscapes associated with the moderate salinity potential include:

- Agnes Banks (ab), Berkshire Park (bp), Blacktown (bt), Luddenham (lu) and Lucas Heights (lh) formations;
- Steeper areas with moderate to high local relief and well drained subsoils such as Picton (pn), West Pennant Hills (wp) and Glenorie (gn) are at a lower risk of developing salinity; and
- Soils are moderate to well drained due to their elevated position in the landscape.

The landforms / geology associated with moderate salinity include:

- Hill-slopes and hill-crests on Wianamatta Shales (Rwb, Rwa and Rwm); and
- Raised abandoned alluvial terraces and drainage lines on Quaternary Alluvium (Qal, Qpn, Qpd, Qpc and Qpp) from Richmond to Camden and east to Rookwood. Localised areas of elevated well drained Tertiary Gravels (Ta, Tl, Tr).

Based on the site being located in an area expected to comprise Wianamatta Group Bringelly Shale (Rwb) and the site not located on a hill-slope or hill-crest, the risk of salinity at the slope is low.

3.0 ASSESSMENT CRITERIA

3.1 Soil Salinity

The criterion used to classify saline soil is presented in **Table 3.1**. Salinity ratings (ECe) are calculated by multiplying the electrical conductivity of a 1:5 soil: water extract by a factor dependant of soil texture ranging from 6 to 17 depending on soil type. Hazelton and Murphy (DLWC 1992) classify soil salinity on the basis of ECe, and describe the implications of the salinity classes on agriculture as follows:

Table 3.1 Soil Salinity Classification

Class	ECe (dS/m)	Implication
Non-Saline	<2	Salinity effects mostly negligible
Slightly Saline	2 – 4	Yields of sensitive crops affected
Moderately Saline	4 – 8	Yields of many crops affected
Very Saline	8 – 16	Only tolerant crops yield satisfactorily
Highly Saline	>16	Only a few very tolerant crops yield satisfactorily

3.2 Aggressivity

The exposure classification or soil aggressivity levels for concrete and steel piles, developed from AS 2159 – 2009 Piling Design and Installation, are shown in **Tables 3.2 and 3.3** below:

Table 3.2 Exposure Classification for Concrete Piles

Exposure Conditions			Exposure Classification (Aggressivity)
Sulphates (as SO_3) in soil (ppm)	pH	Chlorides in water (ppm)	Soil Conditions – B (low permeability soils such as silts and clays)
<4 000	>5.5	<6 000	Non-aggressive
4 000 – 8 000	4.5 – 5.5	6 000 – 12 000	Mild
8 000 – 16 000	4 – 4.5	12 000 – 30 000	Moderate
>16 000	<4	>30 000	Severe

Table 3.2 Exposure Classification for Steel Piles

Exposure Conditions			Exposure Classification (Aggressivity)
Chlorides (as Cl^-) in soil (ppm)	pH	Resistivity (Ohms)	Soil Conditions – B (low permeability soils such as silts and clays)
5 000	>5	<5 000	Non-aggressive
5 000 – 20 000	4.5 – 5	2 000 – 5 000	Non-aggressive
20 000 – 50 000	4 – 4.5	12 000 – 30 000	Moderate
>50 000	<4	>30 000	Severe

3.3 Sodicity

Sodic soils may be affected by very severe surface crusting, very low infiltration and hydraulic conductivity, very hard and dense subsoils, high susceptibility to gully erosion and tunnel erosion. Sodicity also affects the shrink – swell properties of a soil. The ratings of sodicity as shown in DLWC (2002) are in **Table 3.4** below:

Table 3.4 Sodicity Ratings

ESP %	Rating
< 5	Non-sodic
5 – 15	Sodic
> 15	Highly sodic

4.0 ASSESSMENT METHODOLOGY

As outlined in DLWC (2002), the assessment comprised three phases:

1. Detailed site inspection including a walk over to identify areas of potential concern;
2. Site analysis inclusive of test pitting to evaluate soil profile conditions; and
3. Laboratory analysis of selected soil samples and comparison with published criterion.

The adopted methodology is discussed in following sections.

4.1 Sampling Rationale

The sampling density adopted for this investigation was three (3) locations per hectare with two (2) samples per location (i.e. one collected from fill material and one from natural), consistent with DLWC (2002). For the site (approximately 2 hectares) this equated to salinity testing at 3 locations (i.e. 6 samples). Groundwater was not assessed in this investigation.

4.2 Soil Sampling Methodology

Soil samples were collected via test pits excavated using a backhoe to enable observations of the shallow soil profile and collection of appropriate samples for salinity testing. Soil samples were collected at appropriate intervals to enable inspection and testing, with two samples collected per location. During the collection of soil samples, features associated with potential salinity issues was recorded. From DLWC 2002, indicators of salinity outbreaks on the surface or in the soil profile can include:

- Bare soil patches;
- Salt crystals present on the surface;
- 'Puffiness' of soil when dry, or greasy, on some soils if wet;
- Black staining on some soils;
- Presence of indicator vegetation species;
- Die back of trees; and
- Staining and marking of house foundations.

4.3 Laboratory Analysis

AG contracted Eurofins Australia (Eurofins) at Lane Cove, NSW as the laboratory for the required analyses. Eurofins are NATA accredited for the required analyses. Samples were collected and submitted for analysis at the densities required to meet the project DQI requirements outlined in **Table 4.1.**

Table 4.1 Summary of laboratory analytical schedule

Sample Type	No. of Sampling Locations	No. of Analyses
Salinity Assessment	3	Cation Exchange Capacity (CEC) – 6 Exchangeable Sodium Percentage – 6 Soil pH – 6 Sulphates – 6 Chlorides – 6 Salinity (EC 1:5) – 6

5.0 RESULTS AND DISCUSSION

5.1 Field Observations

Field observations and geology encountered at the site during the intrusive investigation is summarised below. Sampling locations are shown on **Figure 2** and bore logs are shown in **Appendix C**. Laboratory analysis data is shown in **Table 1**.

A total of 3 mechanically advanced testpits were excavated for soil investigation purposes. Fill material at the site generally ranged from depths of 0.3 to 0.6 m and was observed to comprise silty clay, brown to grey, dry to damp with inclusions of brick, concrete, glass, bitumen and others. No indicators of salinity were observed including staining, salt crystals, puffiness or greasy soils.

Natural material was observed underlying the fill material at all borehole locations at depths ranging from 0.3 m to 0.6 m. Natural material was observed to comprise clay, orange to brown, stiff to hard, high plasticity, dry to damp.

5.2 Soil Analytical Results

The soil sampling locations are shown on **Figure 2** and summarised laboratory results are presented in **Table 1**. Detailed laboratory reports and chain of custody documentation is provided in **Appendix D**. Laboratory results are discussed in the following sections in relation to the adopted assessment criteria in **Section 6.1**.

5.2.1 Salinity

A total of six (6) samples were analysed for conductivity (EC 1:5 Soil: Water), refer to **Table 1**. The laboratory reported values for EC, which were multiplied by a salinity conversion factors of 7 for silty clay fill and 6 for heavy clays, respectively. The soil was classified as non-saline at all sample locations.

5.2.2 Aggressivity

A total of six (6) samples were analysed for soil pH, sulphates and chlorides, refer to **Table 1**. The results were assessed in conjunction with **Tables 3.2 and 3.3** in **Section 3.2** to classify the aggressivity of the soils. Soils at all locations were given the classification of Non-Aggressive with respect to both steel and/or concrete with the exception of soils at TP3. The pH of soils at TP3 was 4.0 pH units which was within the classification range for 'Moderately Aggressive' to steel and concrete. However, it was noted that the chloride and sulphate concentrations were reported to be in the 'Non-aggressive' range. Therefore all soils at the site were considered to be non-aggressive.

5.2.3 Sodicity

A total of six (6) samples were analysed for ESP, refer to **Table 1**. The results were assessed in conjunction with **Table 3.4** in **Section 3.2** and all soil samples were classified as non-sodic.

6.0 CONCLUSIONS

Based on the scope of work completed for this assessment and the Limitations included in **Section 7**, it is considered that site soils are not characterised as having an elevated risk with respect to soil salinity and as such, specific management of the site during and/or following development works is not required with respect to soil salinity conditions.

The assessment also identified that site soils are considered to be non-aggressive with respect to future steel or concrete foundations and infrastructure.

The assessment also identified that soils at the site were non-sodic, hence there was a low risk of erosion hazards.

7.0 STATEMENT OF LIMITATIONS

This Salinity Assessment Report should be read in conjunction with any previous investigations and evaluated the salinity status of the site. Limited sampling and laboratory analysis were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

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

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

This report has been prepared by Alliance Geotechnical for the sole use of Silky Property Group. No responsibility is accepted for the use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report remains the property of Alliance Geotechnical subject to payment of all fees due for the assessment. The report shall not be reproduced except in full and with prior written permission by Alliance Geotechnical Pty Ltd.

Should you require additional information or clarification regarding any aspect of this report, please call the undersigned on (02) 9675 1777.

For and on behalf of,
Alliance Geotechnical Pty Ltd

Benjamin Regan
B. Eng. (Environmental)
Senior Environmental Consultant
Alliance Geotechnical Pty Ltd

8.0 REFERENCES

ASSMAC (1998) Acid Sulfate Soils Manual 1998. Acid Sulfate Soils Management Advisory Committee, NSW Agriculture, Wollongbar, NSW, August 1998.

Chapman GA and Murphy CL (1989) Soil Landscapes of Sydney 1:100,000 Sheet. Soil Conservation Service of NSW, Sydney.

CMA (1986) Penrith 9030-3-N Topographic Map 1:25,000 (Edition 2). Central Mapping Authority of NSW.

DEC (2004) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Department of Environment and Conservation of New South Wales, DEC 2004/60, June 2004.

DEC (2006) Guidelines for the NSW Site Auditor Scheme 2nd Edition (including the Soil Investigation Levels for Urban Development Sites in NSW). Department of Environment and Conservation NSW, DEC 2006/121, April 2006.

DEC (2007) Guidelines for the Assessment and Management of Groundwater Contamination. Department of Environment and Conservation NSW, DEC 2007/144, March 2007.

DECC (2009) Waste Classification Guidelines. Department of Environment and Climate Change New South Wales, DECC 2009/281, July 2009.

DLWC (1998) Map Series NVWR-4 Groundwater Management (Edition 1). Department of Land and Water Conservation, Map Series for Native Vegetation and Water Reforms, June 1998.

DLWC (2002) Site Investigations for Urban Salinity. Department of Land and Water Conservation (Local Government Salinity Initiative).

DUAP / EPA (1998) Managing Land Contamination. Planning Guidelines SEPP 55 – Remediation of Land. NSW Department of Urban Affairs and Planning / Environment Protection Authority of New South Wales, August 1998.

EPA (1994) Guidelines for Assessing Service Station Sites. Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 94/119, December 1994.

EPA (1995) Sampling Design Guidelines. Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 95/59, September 1995.

EPA (1997) Guidelines for Consultants Reporting on Contaminated Sites. Environment Protection Authority of New South Wales, Contaminated Sites Section, EPA 97/104, November 1997.

EPA (1998) Guidelines for the NSW Site Auditor Scheme (including the Soil Investigation Levels for Urban Development Sites in NSW). Environment Protection Authority of New South Wales, Contaminated Sites Unit, EPA 98/58, June 1998.

GS NSW / DMR (1983) Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1). Geological Survey of New South Wales, Department of Mineral Resources.

Hazelton PA and Murphy BW (ed., 1992) What Do All the Numbers Mean ? A Guide for the Interpretation of Soil Test Results. Department of Conservation and Land Management (incorporating the Soil Conservation Service of NSW), Sydney.

Imray P and Langley A (1999) Health-Based Soil Investigation Levels. National Environmental Health Forum Monographs, Soil Series No. 1, Third Edition.

Imray P and Neville G (1993) Approaches to the Assessment and Management of Asbestos-Contaminated Soil. From the Second National Workshop on the Health Risk Assessment and Management of Contaminated Sites (1993).

Murphy CL (1997) Acid Sulfate Soil Risk of Sydney Sheet. Department of Land and Water Conservation, Sydney, Second Edition. Supplied by the Sydney South Coast, Geographical Information Systems Unit.

Naylor SD, Chapman GA, Atkinson G, Murphy CL, Tulau MJ, Flewin TC, Milford HB and Morand DT (1998) Guidelines for the Use of Acid Sulfate Soil Risk Maps. Department of Land and Water Conservation, Sydney, Second Edition.

NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Measure 1999. National Environmental Protection Council, December 1999.

NEPC (2013) National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1). National Environment Protection Council, Document Ref. OPC50357-B, 11 April, 2013.

OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. New South Wales Office of Environment and Heritage, OEH 2011/0650, August 2011.

US EPA (2000a) Guidance for the Data Quality Objectives Process. EPA QA/G-4. United States Environmental Protection Agency, EPA/600/R-96/055, August 2000.

US EPA (2000b) Data Quality Objectives Process for Hazardous Waste Site Investigations. EPA QA/G-4HW. United States Environmental Protection Agency, EPA/600/R-00/007, January 2000.

Victorian EPA (2002) The Clean Up and Management of Polluted Groundwater. Environment Protection Authority of Victoria, Information Bulletin, Publication 840, April 2002.

WADOH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. Published by the Western Australian Department of Health, May 2009.

WorkCover (2002) Occupational Health and Safety Regulation 2001 (with Margin Notes). WorkCover Authority of New South Wales, Second Edition, February 2002 (Catalogue Number 108).

FIGURES

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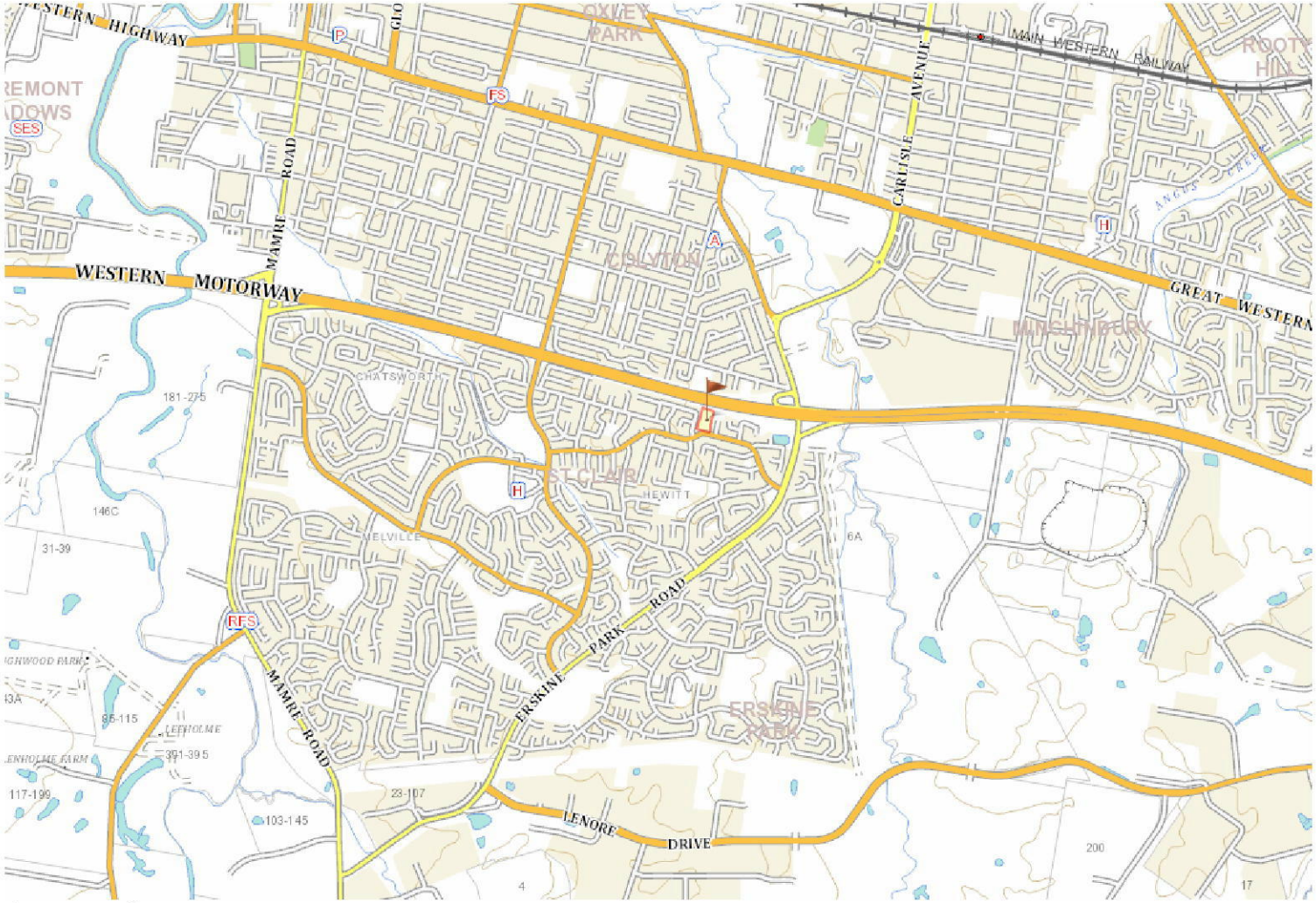
Site Location - Drawing Number: 1842-ER-1-A

Not To Scale

N



Source: SIX Maps (www.maps.six.nsw.gov.au)

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Phone Us Today - 02 9675 1777

Client: Silky Property Group
Project: 94-100 Explorers Way, St Clair, NSW
Location: 94-100 Explorers Way, St Clair, NSW

Job Number: 1842
Report Number: 1842-ER-1-1
Report Date: 28/04/2015

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Site Location - Drawing Number: 1842-ER-1-C

Not To Scale

N

Key

TP1 Sample Locations

Site Boundary

Source: SIX Maps

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Client: Silky Property Group
Project: 94-100 Explorers Way, St Clair, NSW
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Job Number: 1842
Report Number: 1842-ER-1-1
Report Date: 28/04/2015

TABLES

Table 1
94 - 100 Explorers Way, St Clair, NSW
Soil Results
1842-ER-1-2

						S15-Ap07899	S15-Ap07900	S15-Ap07901	S15-Ap07902	S15-Ap07903	S15-Ap07904
						TP1_0.0-0.2	TP1_0.7-0.8	TP2_0.0-0.3	TP2_0.5-0.7	TP3_0.0-0.2	TP3_0.4-0.5
						13/04/2015	13/04/2015	13/04/2015	13/04/2015	13/04/2015	13/04/2015
						Soil	Soil	Soil	Soil	Soil	Soil
Group	**Analyte**	**Units**	**PQL**	**DATASET MINIMUM**	**DATASET MAXIMUM**						
Salinity	Salinity (determined from EC)*	uS/cm	<3	**12**	**250**	91	250	12	80	50	110
	ECe (calculated using conversion factors of 7 for fill and 6 for natural soils)			**0.084**	**1.5**	0.637	1.5	0.084	0.48	0.35	0.66
Aggressivity	pH (1:5 Aqueous extract)	pH	0.1	**4**	**6.7**	6.7	6.7	6.2	4.6	4	4
	Chloride	mg/kg	0.5	**15**	**200**	< 10	200	< 10	< 10	15	77
	Sulphate (as S)	mg/kg	0.5	**16**	**130**	< 10	130	< 10	93	16	44
Sodicity	Exchangeable Sodium Percentage (ESP)*	%	0.1	**0.1**	**0.2**	< 0.1	0.2	< 0.1	0.1	< 0.1	< 0.1

APPENDIX A

SITE PHOTOGRAPHS

Photo 1: Front of small, wooden dwelling, looking north.

Photo 2: Front of garage with wooden dwelling to the left and the gazebo in the background to the right. Looking north-east.

Photo 3: Gazebo, wooden hut and large two-storey dwelling with driveway in foreground. Looking east.

Photo 4: Sheds on eastern boundary of the site, looking north-east.

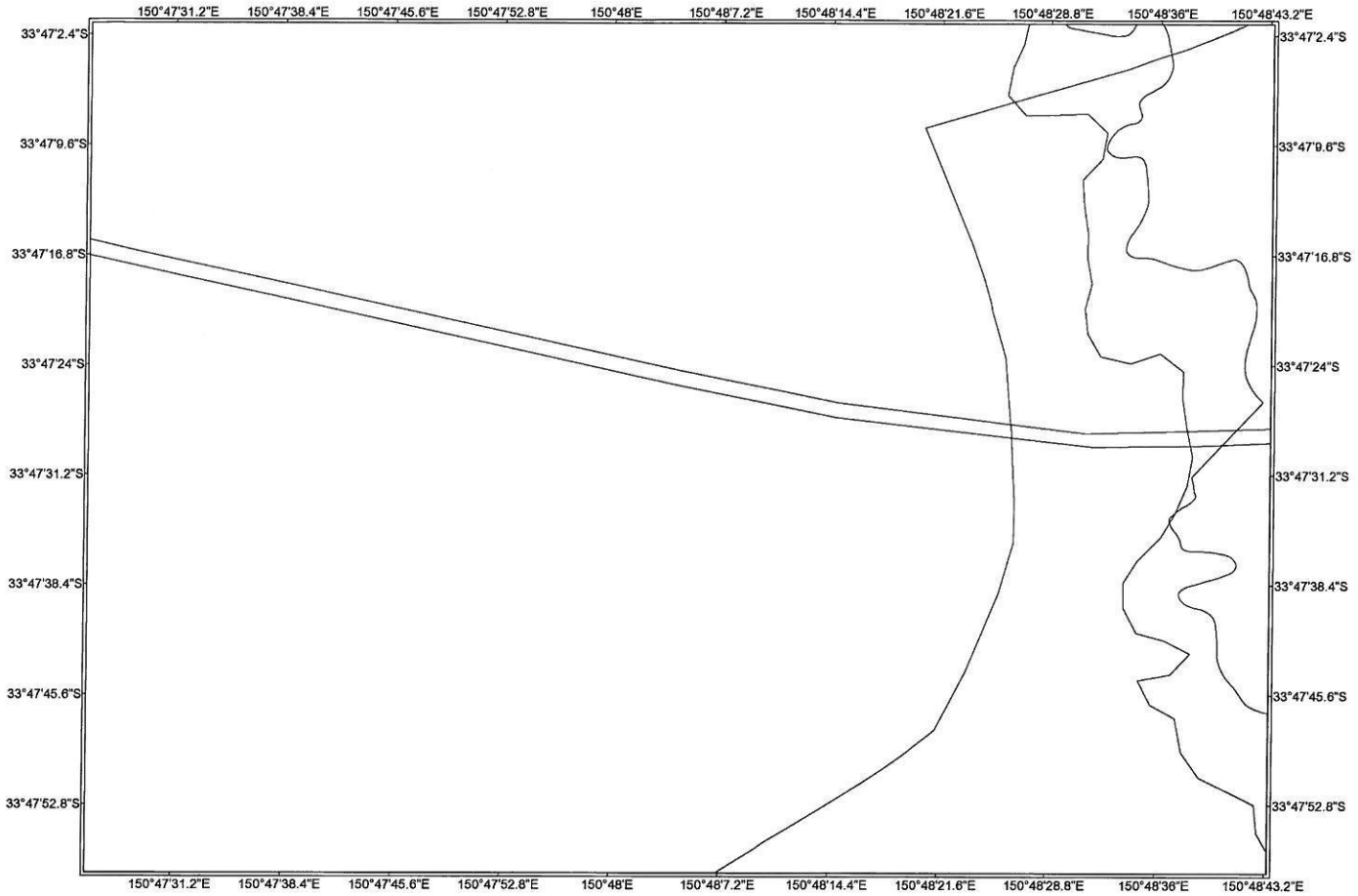
Photo 5: Drainage channel in centre of site with embankments either side of it, looking west.

Photo 6: Suspected soil stockpile on western boundary of site, looking north-east.

APPENDIX B

REGISTERED GROUNDWATER BORES
WITHIN 1.5 KM OF THE SITE

NSW GW Map



Scale : Kilometres

0 0.1 0.2 0.3 0.4 0.5

Projection : Latitude/Longitude

Key

- ..... SMALLTWN
- ..... MEDTOWNS
- ..... ALLBORES
- ..... NSW Major Rivers
- ..... Nsw Rivers
- ..... NSW Railway Lines
- ..... NSW Main Roads
- ..... Irrigation Dams
- ..... Local Government Areas
- ..... Ground Water Management Areas

APPENDIX C

BORE LOGS

Alliance Geotechnical

ENGINEERING | ENVIRONMENTAL | TESTING

Your On-Site Geotechnical & Environmental Specialists

Job No:	1829
Hole No:	**TP1**
Date:	13/04/2015
Logged:	BR

Client:	Ground Engineering Design Pty Ltd	Surface RL:	-
Location:	94 - 100 Explorers Way, St Clair, NSW, 2759	Test Method:	Test Pit

Depth (m)	Graphic Log	Description	PID	Samples	Additional Comments
0.00		Silty clay, brown, dry to damp, firm, moderate plasticity, with foreign materials including brick, glass, tile and concrete.	-	TP1 - 0.0 - 0.2	
0.60		Clay, yellow to brown, damp, high plasticity, soft to firm and no foreign materials.		TP1 - 0.7 - 0.8	

Borehole terminated at 1.0m

Strength
s - Soft
f - Firm
st - Stiff
vst - Very Stiff
h - Hard

Relative Density
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Moisture
D - Dry
SM - Slightly Moist
M - Moist
VM - Very Moist
W - Wet

Weathering
CW - Completely Weathered
EW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
F - Fresh

Alliance Geotechnical

ENGINEERING | ENVIRONMENTAL | TESTING

Your On-Site Geotechnical & Environmental Specialists

Job No:	1829
Hole No:	**TP2**
Date:	13/04/2015
Logged:	BR

Client:	Ground Engineering Design Pty Ltd	Surface RL:	-
Location:	94 - 100 Explorers Way, St Clair, NSW, 2759	Test Method:	Test Pit

Depth (m)	Graphic Log	Description	PID	Samples	Additional Comments
0.00		Silty clay, brown, dry to damp, soft to firm, moderate plasticity, with foreign materials including full bricks, rubber, glass, plastic, PVC pipe and charcoal.	-	TP2 - 0.0 - 0.3	
0.50		Clay, yellow to brown, dry, moderate plasticity, firm, no foreign materials		TP2 - 0.5 - 0.7	

Borehole terminated at 0.9m

Strength
s - Soft
f - Firm
st - Stiff
vst - Very Stiff
h - Hard

Relative Density
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Moisture
D - Dry
SM - Slightly Moist
M - Moist
VM - Very Moist
W - Wet

Weathering
CW - Completely Weathered
EW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
F - Fresh

Alliance Geotechnical

ENGINEERING | ENVIRONMENTAL | TESTING

Your On-Site Geotechnical & Environmental Specialists

Job No:	1829
Hole No:	**TP3**
Date:	13/04/2015
Logged:	BR

Client:	Ground Engineering Design Pty Ltd	Surface RL:	-
Location:	94 - 100 Explorers Way, St Clair, NSW, 2759	Test Method:	Test Pit

Depth (m)	Graphic Log	Description	PID	Samples	Additional Comments
0.00		Silty clay, brown, dry, firm, low plasticity, igneous gravels and no foreign materials.	-	TP3 - 0.0 - 0.2	
0.30		Clay, red to brown, dry, high plasticity, firm and no foreign materials.		TP3 - 0.4 - 0.5	

Borehole terminated at 0.6m

Strength
s - Soft
f - Firm
st - Stiff
vst - Very Stiff
h - Hard

Relative Density
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Moisture
D - Dry
SM - Slightly Moist
M - Moist
VM - Very Moist
W - Wet

Weathering
CW - Completely Weathered
EW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
F - Fresh

APPENDIX D

LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTATION

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Alliance Geotechnical
3/155 Glendenning Road
Glendenning
NSW 2761

Attention: **Michael Dunesky**

Report **453731-S**
Project name ST CLAIR
Received Date Apr 13, 2015

Client Sample ID			**TP1_0.0-0.2**	**TP1_0.7-0.8**	**TP2_0.0-0.3**	**TP2_0.5-0.7**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ap07899**	**S15-Ap07900**	**S15-Ap07901**	**S15-Ap07902**
Date Sampled			**Apr 13, 2015**	**Apr 13, 2015**	**Apr 13, 2015**	**Apr 13, 2015**
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	200	< 10	< 10
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	91	250	12	80
pH (units)(1:5 soil:CaCl2 extract)	0.1	pH Units	6.7	6.7	6.2	4.6
Salinity (determined from EC)*	20	mg/kg	270	700	90	290
Sulphate (as S)	10	mg/kg	< 10	130	< 10	93
Calcium (exchangeable)*	0.1	meq/100g	34	4.3	6.8	2.5
Magnesium (exchangeable)*	0.1	meq/100g	2.9	11	4.8	7.6
Potassium (exchangeable)*	0.1	meq/100g	0.8	< 0.1	0.2	0.2
Sodium (exchangeable)*	0.1	meq/100g	< 0.1	3.8	< 0.1	1.5
% Moisture	0.1	%	15	19	17	15
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	38	19	12	12
Exchangeable Sodium Percentage (ESP)*	0.1	%	< 0.1	0.2	< 0.1	0.1

Client Sample ID			**TP3_0.0-0.2**	**TP3_0.4-0.5**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ap07903**	**S15-Ap07904**
Date Sampled			**Apr 13, 2015**	**Apr 13, 2015**
Test/Reference	LOR	Unit		
Chloride	10	mg/kg	15	77
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	50	110
pH (units)(1:5 soil:CaCl2 extract)	0.1	pH Units	4.0	4.0
Salinity (determined from EC)*	20	mg/kg	160	340
Sulphate (as S)	10	mg/kg	16	44
Calcium (exchangeable)*	0.1	meq/100g	1.2	0.4
Magnesium (exchangeable)*	0.1	meq/100g	0.8	8.5
Potassium (exchangeable)*	0.1	meq/100g	< 0.1	< 0.1
Sodium (exchangeable)*	0.1	meq/100g	< 0.1	0.6
% Moisture	0.1	%	5.8	18
Ion Exchange Properties				
Cation Exchange Capacity	0.05	meq/100g	2.0	9.6
Exchangeable Sodium Percentage (ESP)*	0.1	%	< 0.1	< 0.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Apr 17, 2015	28 Day
- Method: E033 /E045 /E047 Chloride			
pH (units)(1:5 soil:CaCl2 extract)	Sydney	Apr 21, 2015	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Salinity (determined from EC)*	Sydney	Apr 21, 2015	28 Day
- Method: E032.1 Salinity			
Sulphate (as S)	Sydney	Apr 17, 2015	28 Day
- Method: E045 Sulphate			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Apr 15, 2015	7 Day
- Method: LM-LTM-INO-4010			
Calcium (exchangeable)*	Melbourne	Apr 15, 2015	0 Day
Magnesium (exchangeable)*	Melbourne	Apr 15, 2015	0 Day
Potassium (exchangeable)*	Melbourne	Apr 15, 2015	0 Day
Sodium (exchangeable)*	Melbourne	Apr 15, 2015	0 Day
% Moisture	Sydney	Apr 13, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			
Eurofins | mgt Suite 20			
Ion Exchange Properties	Melbourne	Apr 15, 2015	

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

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Site # 1254 & 14271

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

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

Company Name:	Alliance Geotechnical	**Order No.:**		**Received:**	Apr 13, 2015 5:52 PM
Address:	3/155 Glendenning Road Glendenning NSW 2761	**Report #:**	453731	**Due:**	Apr 21, 2015
		Phone:	02 9675 1777	**Priority:**	5 Day
		Fax:	02 9675 1888	**Contact Name:**	Michael Dunesky
Project Name:	ST CLAIR				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Chloride	pH (units)(1:5 soil:CaCl2 extract)	Salinity (determined from EC)*	Sulphate (as S)	Eurofins | mgt Suite 20	Moisture Set
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271									X	
Sydney Laboratory - NATA Site # 18217					X	X	X	X		X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
TP1_0.0-0.2	Apr 13, 2015		Soil	S15-Ap07899	X	X	X	X	X	X
TP1_0.7-0.8	Apr 13, 2015		Soil	S15-Ap07900	X	X	X	X	X	X
TP2_0.0-0.3	Apr 13, 2015		Soil	S15-Ap07901	X	X	X	X	X	X
TP2_0.5-0.7	Apr 13, 2015		Soil	S15-Ap07902	X	X	X	X	X	X
TP3_0.0-0.2	Apr 13, 2015		Soil	S15-Ap07903	X	X	X	X	X	X
TP3_0.4-0.5	Apr 13, 2015		Soil	S15-Ap07904	X	X	X	X	X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

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

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

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

Results <10 times the LOR : No Limit

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

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

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

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

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	< 10			10	Pass	
Sulphate (as S)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	106			70-130	Pass	
Sulphate (as S)	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	S15-Ap08503	NCP	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	S15-Ap07899	CP	uS/cm	91	79	15	30%	Pass	
% Moisture	S15-Fe12872	NCP	%	17	17	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S15-Ap07904	CP	mg/kg	77	78	1.0	30%	Pass	
Sulphate (as S)	S15-Ap07904	CP	mg/kg	44	45	2.0	30%	Pass	

Comments

Sample Integrity

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

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)

Glenn Jackson
National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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☑ **Sydney**
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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Page 1 of 1

Company Name : Alliance Geotechnical
Office Address :
Contact Name: Benjamin Regan
Project Manager :
Email for results : office@allgeo.com.au
Purchase Order :
PROJECT Number :
PROJECT Name: St Clair [redacted]
COC Number :
Eurofins | mgt quote ID : #ISO2BALLGEO
Data output format:

Special Directions & Comments :
See quote number

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Suite B20	pH (CaCl2)	Sulphate	Chloride	Salinity EC 1:5
1	TP1 - 0.0-0.2	13/4/15	Soil	/	/	/	/	/
2	TP1 - 0.7-0.8			/	/	/	/	/
3	TP2 - 0.0-0.3			/	/	/	/	/
4	TP2 - 0.5-0.7			/	/	/	/	/
5	TP3 - 0.0-0.2			/	/	/	/	/
6	TP3 - 0.4-0.5			/	/	/	/	/
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Analytes

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Comments
						/	
						/	
						/	
						/	
						/	
						/	

Suite Codes

B1-TRH/BTEXN
B1A-TRH/MAH
B2-TRH/BTEXN/Pb
B2A-TRH/MAH/Pb
B3-PAH/Phenols
B4-TRH/BTEXN/PAH
B4A-B4 + Phenols
B5-TRH/BTEXN/M7
B6-TRH/BTEXN/M8
B7-TRH/BTEXN/PAH/M8
B7A-B7+Phenols
B8-TRH/VOC/PAH/M8
B9-TRH/BTEXN/PAH/OCP/M8
B10-B8+OPP
B13-OCP/PCB
B15-OCP/OPP/PCB

Relinquished By: Ben Regan
Date & Time:: 13/4/15
Signature:

Laboratory Staff
Received By: Ellen Wg.
Date & Time: Eurofins mgt
Signature:

Turn around time
1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment
☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 453731

Report number: 13 APR 2015 17:52

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

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Alliance Geotechnical**
Contact name:	Michael Dunesky
Project name:	ST CLAIR
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Apr 13, 2015 5:52 PM
Eurofins | mgt reference:	**453731**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

Charl Du Preez on Phone : or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Michael Dunesky - michael@allgeo.com.au.