ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

SEVENTH-DAY ADVENTIST CHURCH SPD LTD
C/- JOHNSTAFF PROJECTS PTY LTD

ON

PRELIMINARY STAGE 1 ENVIRONMENTAL SITE ASSESSMENT

FOR

PROPOSED DEVELOPMENT

AT

CORNER COMENARRA PARKWAY & FOX VALLEY ROAD, WAHROONGA

JANUARY 2013

REF: E26207KrptREV1

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EXECUTIVE SUMMARY

Introduction

Johnstaff Projects Pty Ltd on behalf of Seventh Day Adventist Ltd (the 'client') commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Preliminary Stage 1 Environmental Site Assessment (ESA) for the proposed development at corner of Comenarra Parkway and Fox Valley Road, Wahroonga.

The site is identified as Lot 621 in DP1128314 number and forms part of the Sydney Adventist hospital (SAN). The site location is shown on Figure 1 and the ESA was confined to the site boundaries as shown on Figure 2.

The ESA was undertaken generally in accordance with an EIS proposal (Ref: EP6803K) of 27 November 2012 and written acceptance from the client of 3 December 2012.

EIS understand that the proposed development includes the demolition of the existing buildings located at the site. A new four storey building is to be constructed with a central atrium space. Two levels of basement level car park are to be located below the building footprint.

Objectives and Scope of Work

The objectives of the ESA were to assess the potential risk for soil contamination at the site; Assess the potential for human health or environmental risks posed by the contaminants and Provide a preliminary waste classification for the off-site disposal of soil excavated for the development.

The scope of work included:

- A review of previous investigation report prepared by EIS;
- Prepare site specific Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs);
- A review of site history and background information;
- Site inspection to identify areas of environmental concern (AEC);
- Prepare a Conceptual Site Model (CSM) and identify the Potential Contaminants of Concern (PCC) and potential sensitive receptors;
- Design and implementation of a field sampling and laboratory analysis program;
- Interpretation of the analytical results based on the Site Assessment Criteria (SAC) adopted for the ESA; and
- Preparation of a report presenting the results of the ESA.

Summary of Site History and Site Investigation

A summary of the site history information is presented below:

- The aerial photographs and land title records indicate that the site has been used for unknown purposes since 1930. However it should be noted that at the time of the inspection the site appeared to be used for residential purposes and was potentially a boarding house;
- Council records indicate that the site is not considered to be contaminated;
- WorkCover records did not indicate any licences to store dangerous goods at the site; and
- NSW EPA records did not indicate any notices for the site.

The investigation included soil sampling from five boreholes. Soil samples were analysed for a range of PCC.

Investigation Findings, Discussion and Conclusions

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the SAC adopted for this preliminary Stage 1 ESA.

Based on the results, EIS are of the opinion that the potential for significant widespread soil contamination at the site is relatively low.

Based on the scope of work undertaken, EIS consider the site to can be made suitable for the proposed development provided that the following recommendations are implemented to minimise these risks:

- A Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition works;
- Additional ESA targeting the soils beneath the buildings post demolition works; and
- Inspections during demolition and excavation work to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works programme and schedule in relation to the changed site conditions. Inspections should be undertaken by experienced environmental personnel.

The conclusions presented in this report have been made within the limitations of the scope of works undertaken for the investigation. The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

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1 INTRODUCTION

Johnstaff Projects Pty Ltd on behalf of Seventh Day Adventist Ltd (the 'client') commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas Pty Ltd (J&K), to undertake a Preliminary Stage 1 Environmental Site Assessment (ESA) for the proposed development at corner of Comenarra Parkway and Fox Valley Road, Wahroonga.

The site is identified as Lot 621 in DP1128314 number and forms part of the Sydney Adventist hospital (SAN). The site location is shown on Figure 1 and the ESA was confined to the proposed development area as shown on Figure 2. The proposed development area is referred to as 'the site' in this report.

The ESA was undertaken generally in accordance with an EIS proposal (Ref: EP6803K) of 27 November 2012 and written acceptance from the client of 3 December 2012.

EIS has previously undertaken a preliminary Stage 1 ESA for a proposed residential development at lot 621 in DP1128314. The ESA was confined to the south section of the site as shown on the attached Figure 1. A summary of the previous ESA is presented in Section 2. Relevant site histrory information presented in the previous report has been included in this report.

A geotechnical investigation was undertaken in conjunction with the ESA by JK Geotechnics. The results of the geotechnical investigation are presented in a separate draft report (Ref. 26207ZJrpt, dated 21 December, 2012[1]).

1.1 Proposed Development Details

EIS understand that the proposed development includes the demolition of the existing buildings located at the site. A new four storey building containing office premises used for professional activities is to be constructed with a central atrium space. Two levels of basement level car park are to be located below the building footprint.

[1] Referred to as JK Report 2012

1.2 Objectives

The objectives of the ESA are to:

- Assess the potential risk for soil contamination at the site;
- Assess the potential for human health or environmental risks posed by the contaminants; and
- Provide a preliminary waste classification for the off-site disposal of soil excavated for the development.

1.3 Scope of Work

The scope of work included:

- A review of previous investigation report prepared by EIS;
- Prepare site specific Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs);
- A review of site history and background information;
- Site inspection to identify areas of environmental concern (AEC);
- Prepare a Conceptual Site Model (CSM) and identify the Potential Contaminants of Concern (PCC) and potential sensitive receptors;
- Design and implementation of a field sampling and laboratory analysis program;
- Interpretation of the analytical results based on the Site Assessment Criteria (SAC) adopted for the ESA; and
- Preparation of a report presenting the results of the ESA.

The ESA was generally undertaken with reference to regulations/guidelines outlined in the table below. Individual guidelines applicable for this ESA are also referenced within the text of the report.

Table 1-1: Guidelines

Guidelines/Regulations/Documents
Contaminated Land Management Amendment Act (2008[2])
State Environmental Planning Policy No.55 – Remediation of Land (1998[3])
NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (1997[4])
Guidelines on the Duty to Report Contamination[5]
Guidelines for the NSW Site Auditor Scheme, 2nd Edition (2006[6])

[2] *Contaminated Land Management Amendment Act,* NSW Government Legislation, 2008 (CLM Amendment Act 2008)

[3] *State Environmental Planning Policy No. 55 – Remediation of Land,* NSW Government, 1998 (SEPP55)

[4] *Guidelines for Consultants Reporting on Contaminated Sites,* NSW EPA, 1997 (Reporting Guidelines 1997)

[5] *Guidelines on the Duty to Report Contamination*, NSW EPA, Draft 2011 (Duty to Report Contamination 2011)

[6] *Guidelines for the NSW Site Auditor Scheme, 2nd ed.,* NSW DEC, 2006 (Site Auditor Guidelines 2006)

Guidelines/Regulations/Documents
National Environmental Protection (Assessment of Site Contamination) Measure (1999[7]).
NSW EPA Contaminated Sites Sampling Design Guidelines (1995[8])
NSW DECCW Waste Classification Guidelines - Part 1: Classifying Waste (2009[9])
Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008[10])
NSW EPA Contaminated Sites: Guidelines for Assessing Service Station Sites (1994[11])
Working with Asbestos Guide (2008[12])

[7] *National Environmental Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council (NEPC), 1999 (NEPM 1999)

[8] *Contaminated Sites Sampling Design Guidelines,* NSW EPA, 1995 (EPA Sampling Design Guidelines 1995)

[9] *Waste Classification Guidelines, Part 1: Classifying Waste,* NSW DECCW, 2009 (Waste Classification Guidelines 2009)

[10] *Protection of Environment Operation (Underground Petroleum Storage Systems) Regulation*, NSW Government, 2008 (UPSS Regulation 2008)

[11] *Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (Service Station Guidelines 1994)

[12] *Working with Asbestos Guide,* NSW WorkCover, 2008 (WorkCover Working with Asbestos Guide 2008)

2 BACKGROUND

EIS have reviewed the following documents provided for the preparation of this report:

2.1 Preliminary Environmental Site Assessment (EIS, October 2012[13])

Taylor Thomson Whitting Pty Ltd on behalf of Australian Conference Association commissioned Environmental Investigation Services (EIS), a division of Jeffery & Katauskas (J&K), to undertake a preliminary Stage 1 Environmental Site Assessment (ESA) for the proposed development at 185 Fox Valley Road, Wahroonga in October 2012.

A geotechnical investigation was undertaken in conjunction with the environmental site assessment by by JK Geotechnics (a division of J&K) and the results are presented in a separate report (Ref. 25803Prpt, dated 31 July 2012).

The proposed development included the demolition of the existing structures and removal of trees at the site and construction of two four storey residential buildings and two six storey buildings used for student accommodation and key worker housing over two levels of basement.

The NSW EPA Sampling Design Guidelines 1995 recommend sampling density for contamination assessment based on a systematic sampling pattern. Based on the size of the investigation area, the guidelines recommended sampling from a minimum of thirteen evenly spaced sampling points for the proposed development area of approximately 4,600m².

Samples were obtained from 7 sampling locations for the investigation. This density is approximately 54% of the minimum sampling density.

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the site assessment criteria adopted for the preliminary Stage 1 ESA.

Based on the results, EIS were of the opinion that the potential for significant wide spread soil contamination at the site was relatively low.

[13] Report to Australian Conference Association Limited on Preliminary Stage 1 Environmental Site Assessment for Proposed Residential Development at 185 Fox Valley Road, Wahroonga, NSW 2076, Ref: E25803KGrpt-REV1, dated October 2012

Based on the scope of work undertaken, the report concluded that the site was suitable for the proposed student accommodation and key worker housing development.

The report recommended some additional sampling and analysis in the vicinity of BH6 to better assess what appeared to be hydrocarbon impacted natural soil.

3 DATA QUALITY OBJECTIVES

3.1 DQOs for the Assessment

The DQO process includes a clear statement of the objectives of the study and a methodology for collecting enough data of sufficient quality to support the decisions of the study. The DQOs provide a systematic approach for undertaking the assessment and outlines the criteria against which the data can be assessed.

A methodology for establishing the DQOs is presented in the US EPA document *Data Quality Objectives Process for Hazardous Waste Site Investigations* (2000[14]). This methodology has been adopted by the NEPC in NEPM 1999, AS4482.1-2005[15] and the Site Auditor Guidelines 2006. The main steps involved in preparing the DQOs include:

1. State the problem;
2. Identify the decision;
3. Identify inputs into the decision;
4. Study boundaries;
5. Develop a decision rule;
6. Specify limits on decision errors; and
7. Optimise the design for obtaining data.

The first six steps provide qualitative and quantitative statements which are used in the final step to develop a data collection plan. The data is then assessed against adopted performance criteria.

The analytical results will be compared with the SAC as outlined in **Section 7**. Statistical analysis will be undertaken on the analytical results (if required) as outlined in the EPA Sampling Design Guidelines 1995. The following criteria will be adopted for the assessment:

- The 95% Upper Confidence Limit (UCL) value of the arithmetic mean concentration of each contaminant should be less than the SAC;
- The standard deviation (SD) of the results must be less than 50% of the SAC; and
- No single value exceeds 250% of the relevant SAC.

UCL calculations may not be required if all results are below the SAC. Further assessment or remediation will be required when the concentration of contaminants exceed the above criteria.

[14] *Data Quality Objectives Process for Hazardous Waste Site Investigations,* US EPA, *2000* (US EPA 2000)
[15] *Guide to the Investigation and Sampling of sites with Potentially Contaminated Soil,* Standards Australia, 2005 (AS 2005)

A review of the field and laboratory DQIs will be undertaken as outlined in **Section 3.2**.

3.2 DQIs for Analytical Data

The analytical data will be assessed against the following DQIs: precision, accuracy, representativeness, completeness and comparability. Definitions of the individual DQIs are presented in Appendix D. The table below outlines the steps that will be taken to address the DQIs:

Table 3-1: DQIs

Indicator	Methods
Completeness	Data and documentation completeness will be achieved by: • Preparation of sampling and analysis plan; • Preparation of chain of custody (COC) records; • Review the laboratory sample receipt information; • Use of National Association of Testing Authorities (NATA) registered laboratories for all analysis; • Visual and PID screening of samples during the investigation; and • Laboratory analysis to target PCC.
Comparability	Data comparability will be achieved by: • Maintaining consistency in sampling techniques; • Use of appropriate preservation, storage and transport methods; and • Use of consistent analysis techniques and reporting standards by the laboratories.
Representativeness	Data representativeness will be achieved by: • Appropriate coverage of sample locations across accessible areas of the site; and • Representative coverage of analysis for PCC.
Precision	Precision will be achieved by: • Calculating the relative percentage difference (RPD) of duplicate samples; • The following acceptance criteria will be used to assess the RPD results: ➢ results > 10 times the practical quantitation limit (PQL), RPDs < 50% are acceptable; ➢ results between 5 and 10 times PQL, RPDs < 75% are acceptable; ➢ results > 5 times PQL, RPDs < 100% are acceptable; and • An explanation is provided if RPD results are outside the acceptance criteria. As a conservative measure, the higher value is adopted when the value exceeds the SAC.
Accuracy	Accuracy will be achieved by:

Indicator	Methods
	• Use of trained and qualified field staff; • Appropriate industry standard sampling equipment and decontamination procedures; • Sampling and screening equipment will be factory calibrated on a regular basis. Calibration will be checked internally prior to use; • Sampling and equipment decontamination; • Collection and analysis of field Quality Assurance (QA) and Quality Control (QC) samples for PCC; • As a minimum, the field QA/QC analysis will include: ➢ 12.5% of samples as intra-laboratory duplicates; • Appropriate sample preservation, handing, holding time and COC procedure; • Review of the primary laboratory QA/QC data including: RPDs, surrogate recovery, repeat analysis, blanks, laboratory control samples (LCS) and matrix spikes; • The following acceptance criteria will be used to assess the primary laboratory QA/QC results. Non-compliance to be documented: ➢ <u>RPDs</u>: o results that are < 5 times the PQL, any RPD is acceptable; and o results > 5 times the PQL, RPDs between 0-50% are acceptable; ➢ <u>LCS recovery and matrix spikes</u>: o 70-130% recovery acceptable for metals and inorganics; o 60-140% recovery acceptable for organics; and o 10-140% recovery acceptable for VOCs; ➢ <u>Surrogate spike recovery</u>: o 60-140% recovery acceptable for general organics; and o 10-140% recovery acceptable for VOCs; ➢ <u>Blanks</u>: All less than PQL (ALTPQL); and • Reporting to industry standards.

4 SITE INFORMATION AND PHYSICAL SETTING

4.1 Site Identification

Table 4-1: Site Identification Information

Site Owner:	Australian Conference Association Limited
Site Address:	172 Fox Valley Road, Wahroonga, NSW
Lot & Deposited Plan:	Lot 621 DP 1128314
Current Land Use:	School / Hospital
Proposed Land Use:	Offices
Local Government Authority:	Ku-ring-gai Council
Current Zoning:	R1, R2, R3, R4, B1, E2 and SP1 (Refer to Planning Certificate in Appendix C)
Area of Proposed Development (m^2):	6,000
RL (AHD in m) (approx.):	165
Geographical Location (MGA) (approx.):	N: 33 44 07 E: 151 05 55
Site Location Plan:	Figure 1
Borehole Location Plan:	Figure 2

4.2 Site Location and Setting

The site is located in a predominatley residential area of Wahroonga. The site is bounded by Comenarra Parkway to the south and Fox Valley Road to the west. Wahroonga Adventist School is located at the west of the site beyond Fox Valley Road. Sydney Adventist Hospital is located to the north of Wahroonga Adventist School. Residential properties are located to the south of the site beyond Comenarra Parkway.

Coups Creek a tributary of Lane Cove River is located approximately 400m east of the site.

4.3 Topography

The regional topography is characterised by a hill slope that generally falls to the east at approximately 4°. The site itself slopes to the east at approximately 2°. A number of sandstone outcrops were noted a short distance beyond the eastern site boundary.

4.4 Site Inspection

At the time of the inspection, the site was occupied by a 2-storey and a single storey brick building separated by a concrete pathway. The inspection was limited to accessible areas of the site and did not include an internal inspection of buildings. However, it appeared that the site was used for residential purposes (potentially a boarding house). An asphaltic concrete driveway extended off Comenarra Parkway along the east boundary of the site. Concrete pathways were located adjacent to most of the perimeters of the buildings and also extended to Comenarra Parkway and Fox Valley Road.

A brick wall approximately 0.5m in height was located along the south and west boundary of the site. A dry stone wall supported the subject site along the mid-eastern site boundary. The west section of the site was covered by small plants, shrubs and trees. A number of large tress approximately 10m plus in height were located in the south section of the site. The remainder of the site was generally grassed.

4.5 Regional Geology

The regional geological map of Sydney (1983[16]) indicates the site to be underlain by Ashfield Shale of the Wianamatta Group, which typically consists of black to dark grey shale and laminite.

4.6 Hydrogeology

A search of the groundwater bore summary records available on the NSW Office of Water[17] website was undertaken for the ESA. The search was limited to registered bores located within approximately 1km of the site. A copy of the records and a plan showing the approximate location of the bores is attached in Appendix C. A brief summary of relevant information pertaining to the ESA is presented below:

Table 4-2: Summary of Groundwater Bores

Reference	Distance from site (m) (approx.)	Direction & Gradient from site	Final Depth (m)	Standing Water Level (SWL) (m)	Registered Purpose	Potential Receptor
GW107929	450m	North-west up and cross gradient	180	58	Recreation	No

[16] *1:100,000 Geological Map of Sydney (Series 9130)* Department of Mineral Resources (1983)

[17] http://www.waterinfo.nsw.gov.au/gw/, visited on 11 December 2012

The stratigraphy of the site is expected to consist of residual clayey soils overlying relatively shallow bedrock. Based on these conditions and the results of the groundwater bore search, groundwater is not considered to be a significant resource for abstraction purposes in the immediate vicinity of the site. A perched aquifer located in the shallow subsurface is not considered to be a resource due to high salinity, poor water quality and low yield. Perched aquifers in shale often contain concentrations of heavy metals which may be above the investigation triggers values outlined in ANZECC 2000.

5 SITE HISTORY ASSESSMENT

5.1 Aerial Photographs

Historical aerial photographs of the site and immediate surrounds were reviewed for the site history assessment. The majority of the photographs were obtained from the NSW Department of Lands. A summary of the relevant information is presented in the following table:

Table 5-1: Summary of Historical Aerial Photos

Year	Details
1930	The 1930 aerial photograph was of poor quality. The site appeared to be grassed. A square shaped building was located in the north section of the site. The particular use of the building was unclear. What appeared to be markets gardens and orchards were located to the north and west of the site beyond Fox Valley Road. A number of small to medium sized buildings were located to the north west of the site. Dense bushland was located to the east and south-east of the site. Residential houses were located to the south of Comenarra Parkway.
1943[18]	The site appeared generally similar to the 1930 aerial photograph. However the square shaped building appeared to have been demolished with a large rectangular shaped building constructed in its place. The particular use of the building was unclear. The general surroundings appeared similar to the 1930 aerial photograph. A number of additional buildings were constructed to the north-west of the site (these buildings appear to be consistent with the existing buildings associated with the Sydney Adventist Hospital).
1951	The site appeared generally similar to the 1943 aerial photograph. However what appeared to be two detached buildings were constructed in the central section of the site. The larger of the two buildings appeared to be constructed in an 'L' shaped manner with the small of the two building rectangular in shape. The general surroundings appeared similar to the 1943 aerial photograph.
1961	The site and general surroundings appeared similar to the 1951 aerial photograph.
1970	The site and general surroundings appeared similar to the 1961 aerial photograph.
1978	The rectangular shaped building in the north section of the site appeared to have been demolished. The two buildings in the central section of the site appeared to

[18] https://six.maps.nsw.gov.au/wps/portal/SIXViewer, visited on 2 January 2013

Year	Details
	have connected via construction work. The building therefore formed a 'U' shaped facing Fox Valley Road. A second 'U' shaped building was constructed in the east section of the site. The general surroundings appeared similar to the 1970 aerial photograph. The general area appeared to have increased in density of residential land use. A number of additional buildings appeared to have been constructed within the Sydney Adventist hospital grounds.
1986	The general surroundings appeared similar to the 1978 aerial photograph.
1994	The general surroundings appeared similar to the 1986 aerial photograph. A number of additional buildings appeared to have been constructed within the Sydney Adventist hospital grounds.
2005	The general surroundings appeared similar to the 1994 aerial photograph.
2011[19]	The general surroundings appeared similar to the 2005 aerial photograph.

5.2 Land Title Search

Land title records were reviewed for the site history assessment. The record search was performed by Advance Legal Searchers. Copies of the title records are presented in Appendix C. A summary of the relevant information is presented in the following table:

Table 5-2: Summary of Land Title Information

Date	Proprietor
	(Lot 621 DP 1128314)
2008 – todate	Australasian Conference Association Limited
(2008 – todate)	*(various commercial leases see Folio Identifier 621/1128314)*
(2008 – todate)	*(various commercial leases see Historical Folio Identifier 621/1128314)*
	(Lot 62 DP 1017514)
2000 – 2008	Australasian Conference Association Limited
(2000 – 2008)	*(various commercial leases see Folio Identifier 62/1017514)*
(2000 – 2008)	*(various commercial leases see Historical Folio Identifier 62/1017514)*
	(Lot 53 DP 880017)
1998 – 2000	Australasian Conference Association Limited

[19] http://maps.six.nsw.gov.au/ visited on 18 December 2012

Date	Proprietor
(1998 – 2000)	*(various commercial leases see Historical Folio Identifier 53/880017)*
	(Lot 14 DP 834969)
1994 – 1998	Australasian Conference Association Limited
(1994 – 1998)	*(various commercial leases see Historical Folio Identifier 14/834969)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 158 Acres 0 Roods 25 Perches – CTVol 8447 Fol 83)
1963 – 1994	Australasian Conference Association Limited
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ¼ Perches – CTVol 6572 Fol 212)
1952 – 1963	Australasian Conference Association Limited
(1955 – 1958)	*(lease to Walter George Fredericks, storekeeper & Margaret Lucy Fredericks, of part)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ½ Perches – CTVol 5964 Fol 61)
1949 – 1952	Australasian Conference Association Limited
	See Notes (a), (b), (c) & (d)
	Note (a)
	(Part Portions 29 & 30 Parish Gordon – Area 74 Acres 0 Roods 3 ¾ Perches – CTVol 4506 Fol 44)
1931 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 75 Acres 1 Roods 18 Perches – CTVol 2827 Fol 182)
1918 – 1931	Australasian Conference Association Limited
	See Notes (ai) & (aii)
	Note (ai)
	(Part Portion 30 Parish Gordon – Area 9 Acres 0 Roods 33 Perches – CTVol 97 Fol 141)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1890 – 1901	Joshua Reubon Johnson, minor
	Note (aii)
	(Part Portions 29 & 30 Parish Gordon – Area 71 Acres 2 Roods 21 Perches – CTVol 98 Fol 64)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited

Date	Proprietor
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1895 – 1901	Elizabeth Sharpe Evans, widow
1870 – 1895	Richard Battleff Evans, labourer
	Note (b)
	(Part Portion 31 Parish Gordon – Area 54 Acres 2 Roods 31 ½ Perches – CTVol 5011 Fol 245)
1941 – 1949	Australasian Conference Association Limited
1939 – 1941	Perpetual Trustee Company (Limited)
	(Portion 31 Parish Gordon – Area 72 Acres – CTVol 313 Fol 146)
1935 – 1939	Perpetual Trustee Company (Limited)
1885 – 1935	Austin Torange, esquire
1877 – 1885	Alexander Bowman, grantee
	Note (c)
	(Part Portions 29 & 30 Parish Gordon – Area 16 Acres 3 Roods 18 Perches – CTVol 3067 Fol 88)
1920 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 17 Acres 0 Roods 10 ½ Perches – CTVol 2112 Fol 104)
1910 – 1920	Alexander Gordon Waugh, orchardist
	Note (d)
	(1 Acre 2 Rood 4 ½ Perches, Grant of Closed – CTVol 4785 Fol 192)
1936 – 1949	Australasian Conference Association Limited

The title records did not indicate any particular land use that may have resulted in significant site contamination.

5.3 Council Records

5.3.1 Development Applications (DA), Building Approvals (BA)

A review of Council DA, BA and property files is currently underway and the results will be forwarded when received.

5.3.2 Section 149 Planning Certificate

The s149 (2 and 5) planning certificates were reviewed for the site history assessment. Copies of the certificates are attached in Appendix C. A summary of the relevant information is presented below:

- The site is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of CLM Act 1997;
- The site is not subject to a Site Audit Statement (SAS);
- The site is not located within a Class 1 or 2 ASS risk area; and
- The site is located in a heritage conservation area or draft heritage conservation area, however, no heritage items have been identified at the site.

5.4 WorkCover Records

WorkCover records were reviewed for the site history assessment. A copy of the WorkCover letter is attached in Appendix C. The search did not indicate any licences to store dangerous goods including underground fuel storage tanks (USTs) at the site.

5.5 NSW EPA Records

The NSW EPA records available online were reviewed for the site history assessment. A summary of the relevant information is provided in the following table:

Table 5-3: Summary of NSW EPA Online Records

Source	Details
CLM Act 1997[20]	No notices for the site under Section 58 of the Act.
NSW EPA List of Contaminated Sites[21]	The site is not listed in the NSW EPA register.
POEO Register[22]	No notices for the site in the POEO register.

[20] http://www.environment.nsw.gov.au/prclmapp/searchregister.aspx, visited on 18 December 2012
[21] http://www.environment.nsw.gov.au/clm/publiclist.htm, visited on 18 December 2012
[22] http://www.environment.nsw.gov.au/prpoeoapp/, visited on 18 December 2012

5.6 Summary of Site History

A summary of the site history information is presented below:

- The aerial photographs and land title records indicate that the site has been used for unknown purposes since 1930. However it should be noted that at the time of the inspection the site appeared to be used for residential purposes and was potentially a boarding house;
- Council records indicate that the site is not considered to be contaminated;
- WorkCover records did not indicate any licences to store dangerous goods at the site; and
- NSW EPA records did not indicate any notices for the site.

5.7 Integrity of Site History Information

The majority of the site history information has been obtained from government organisations as outlined above. The veracity of the information from these sources is considered to be relatively high. A certain degree of information loss can be expected given the age of the development; gap between aerial photographs; and lack of information prior to the 1900's.

6 CONCEPTUAL SITE MODEL (CSM)

6.1 Areas of Environmental Concern (AEC) & Potential Contaminants of Concern (PCC)

The AEC and PCC identified at the site are outlined in the following table:

Table 6-1: AEC and PCC

AEC	PCC
Fill Material: Fill material on site may have been historically imported from various sources and can contain elevated concentrations of contaminants.	HM, TPH, BTEX, PAHs,VOCs, OCPs, OPPs, PCBs and asbestos
Hazardous Building Material: The former buildings demolished at the site may have been constructed from hazardous materials containing asbestos (eg. asbestos containing fibrous cement sheeting). During the demolition process small discreet pieces of asbestos containing materials may have left behind.	asbestos

Note:
HM – Heavy metals including arsenic, cadmium, chromium, copper, lead, mercury, nickel & zinc
TPH – Total petroleum hydrocarbons including light, mid and heavy fractions
BTEX – Monocyclic aromatic hydrocarbons
VOCs - Volatile organic compounds includes BTEX compounds
PAHs - Polycyclic aromatic hydrocarbons
OCPs - Organochlorine pesticides
OPPs - Organophosphorus pesticides
PCBs - Polychlorinated Biphenyls

As the AECs identified at the site are surface based (i.e. fill), the potential for the contaminants to impact the groundwater is considered to be low. Therefore no specific assessment of groundwater contamination has been undertaken for the ESA.

6.2 Contamination Fate and Transport

The fate and transport of PCC identified at the site above is summarised in the following table:

Table 6-2: Fate and Transport of PCC

PCC	Fate and Transport
Non-volatile contaminants including metals, heavy fraction PAHs, OCPs, OPPs, PCBs and asbestos	With the exception of asbestos, non-volatile contaminants are predominantly confined to the soil and groundwater medium. The mobility of these contaminants varies depending on: the nature and type of contaminant present (e.g. leachability, viscosity etc); soil

PCC	Fate and Transport
	type/porosity; surface water infiltration; groundwater levels; and the rate of groundwater movement. At this site, the potential for surface water infiltration is very limited which would reduce the migration potential for certain contaminants. The presence of paved surfaces in the surrounding areas can also limit the migration potential for non-volatile contaminants. The potential for migration of asbestos fibres would increase following disturbance of asbestos contaminated soils. This is likely to occur during demolition and excavation works. A number of studies have found that soils effectively filter out asbestos fibres and retain them near the surface. The studies concluded that there is no significant migration of asbestos fibres, either through soil or groundwater. The transport of airborne asbestos is associated with disturbance of the material and therefore would be expected during demolition and excavation works.
Volatile contaminants including TPH, BTEX, and light fraction PAHs	Volatile contaminants are usually more mobile when compared to the non-volatile compounds. The potential for migration of volatile contaminants such as light fraction PAHs and TPH is relatively high in sandy soil with a high water table. These contaminants break down rapidly as a result of microbial activity and availability of nutrients including nitrogen, oxygen etc. The mobile contaminants would be expected to move down to the rock surface or groundwater table and migrate down gradient from the source. The mobility would depend on a range of factors such as: soil type/porosity; surface water infiltration; groundwater levels; porosity, confining layers within the aquifer, solubility in groundwater etc.

6.3 Sensitive Receptors and Exposure Pathways

The potential receptors and exposure pathways identified for the PCC at the site are presented in the following table:

Table 6-3: Potential Receptors and Exposure Pathways

Receptor	Pathway
Human Receptors: • Site occupants; • Site visitors; • Contractors and workers; • Future site occupants; and • Off-site occupants.	• Exposure by direct contact via dermal, ingestion and inhalation; • Inhalation of airborne asbestos fibres; and • Abstraction and use of contaminated groundwater.
Environmental Receptors: • Coups Creek located approximately 400m to the east of the site; and • Landscaped areas located in the west and south sections of the site;	• Exposure by direct contact with plants and animals; and • Extraction and use of contaminated water for agricultural and/or landscaping.

7 SITE ASSESSMENT CRITERIA (SAC)

7.1 Soil

The assessment criteria for soil contamination are derived from NEPM 1999 and the Site Auditor Guidelines 2006.

7.1.1 Health Investigation Levels (HILs)

The NEPM 1999 includes Health Based Investigation Levels (HILs) for a range of contaminants based on the risk of exposure, duration of exposure, toxicity and land use (availability). The HILs are divided into four categories outlined in the following table:

Table 7-1: HILs Categories

Category/Column	Land Use
Column A	'Standard' residential with garden/ accessible soil (home-grown produce contributing less than 10% of vegetable and fruit intake; no poultry); includes children's day-care centres, kindergartens, preschools and primary schools.
Column D	Residential with minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats.
Column E	Parks, recreational open space and playing fields: includes secondary schools.
Column F	Commercial/Industrial: includes premises such as shops and offices as well as factories and industrial sites.

Where the proposed land use includes more than one land use category (for example a mixed-use development including residential/retail/commercial land uses) the exposure setting of the most 'sensitive' land use should be adopted for the site.

7.1.2 Petroleum Hydrocarbons in Soil

Threshold concentrations for petroleum hydrocarbon including total TPH and BTEX compounds have been adopted from the Service Station Guidelines 1994 referenced in the Site Auditor Guidelines 2006. Heavy fraction petroleum hydrocarbon aliphatic/aromatic component threshold concentrations have been adopted from NEPM 1999 (as applicable).

Soil samples are initially analysed for total recoverable hydrocarbons (TRH) without a preliminary silica gel clean-up of the sample. Consequently the TRH result may include other compounds such as phthalates, humic acids, fatty acids and sterols (if present).

Silica gel clean-up should remove these other compounds and result in a more accurate result for petroleum hydrocarbons. If undertaken these results have been referred to as TPH_{sgel} within this report.

7.1.3 Provisional Phyto-toxicity Investigation Levels (PPILs)

PPILs are included in the assessment where the proposed land use includes landscaped areas or garden accessible soils. Contaminants above the PPIL threshold may cause phytotoxicity in some plant species. The PPILs are listed in the Site Auditor Guidelines 2006 and are identical to the Ecological Investigation Levels (EILs) specified in NEPM 1999.

7.1.4 Asbestos in Soil

The NEPM 1999 do not provide numeric guidelines for the assessment of asbestos in soil. The draft NEPM[23] guidelines have essentially adopted the Western Australian Asbestos Guidelines 2009[24] which prescribe a site investigative model and asbestos clean-up goals. These guidelines however, have not yet been adopted in NSW and as such are generally only used on a site specific basis.

The general criterion currently used for the assessment of asbestos in soil is the presence/absence of asbestos in soil in accordance with AS4964-2004[25]. If asbestos is found to be present, the status of the asbestos material (friable or bonded/non-friable) is further considered due to the implications associated with site remediation and/or management.

The WorkCover publication *Working with Asbestos Guide* (2008[26]) recommends that the status of the asbestos material in soil should be assessed by an occupational hygienist. More recently, the 2011 WHS Regulation[27] and associated Safe Work

[23] *Draft National Environmental Protection (Assessment of Site Contamination) Measure,* as varied, National Environment Protection Council (NEPC), 2011 (Draft NEPM 2011)

[24] *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, WA Department of health, Perth, Australia, May 2009 (Western Australian Asbestos Guidelines 2009)

[25] Australian Standard 4964, *Method for the Qualitative Identification of Asbestos in Bulk Samples*, Australian Standards, 2004

[26] *Working with Asbestos Guide,* NSW WorkCover, 2008 (WorkCover Working with Asbestos Guide 2008)

[27] *Work Health and Safety Regulation*, NSW Government 2011

Australia code of practice, *How to Safely Remove Asbestos*[28] (endorsed by WorkCover NSW) states that the assessment of asbestos contaminated soil is to be undertaken by a licenced asbestos assessor or competent person. WorkCover NSW has not currently issued any licences for asbestos assessors. Correspondence with WorkCover indicates that the licence program is currently being implemented in accordance with the Safe Work Australia Guide for Applicants for Asbestos Assessor Licences[29]. The ACT Planning and Land Authority currently issues licences for asbestos assessor Class A and Class B.

At present, the assessment of asbestos contamination in soil is undertaken in accordance with the NEPM guidelines, the adoption of the draft NEPM is considered only on a site specific basis. Assessment of the contaminant levels and status of asbestos contaminated soil is undertaken by a combination of: site assessment by experienced environmental consultants and ACT accredited asbestos assessors; and soil screening by NATA endorsed laboratories using AS4964-2004.

7.1.5 Soil Assessment Criteria

The soil assessment criteria adopted for the ESA is presented in the following table:

Table 7-2: Soil SAC

Analyte	Column F[1] (mg/kg)	PPILs[2] (mg/kg)
Metals		
Arsenic (total)	500	20
Cadmium	100	3
Chromium (III)	60%	400
Copper	5000	100
Lead	1500	600
Mercury (inorganic)	75	1
Nickel	3000	60
Zinc	35000	200
Petroleum Hydrocarbons		
TPH (C_6-C_9)	65 [a]	Na
TPH (C_{10}-C_{36})	1000 [a]	Na
Benzene	1 [a]	Na
Toluene	1.4 [a]	Na
Ethylbenzene	3.1 [a]	Na

[28] *National Code of Practice How to Safely Remove Asbestos*, Safe Work Australia 2011

[29] *Guide for Applicants for Asbestos Removal and Asbestos Assessor Licences and Notifications*, Safe Work Australia 2012

Analyte	Column F[1] (mg/kg)	PPILs[2] (mg/kg)
Total Xylenes	14 [a]	Na
PAHs		
Total PAHs	100	Na
Benzo(a)pyrene	5	Na
Pesticides		
Aldrin + Dieldrin	50	Na
Chlordane	250	Na
DDT + DDD + DDE	1000	Na
Heptachlor	50	Na
Total OPPs	0.1[b]	Na
Others		
PCBs (Total)	50	Na
Asbestos	NDLR [c]	Na

Note:
1 – HILs outlined in NEPM 1999
2 – PPILs outlined in the Site Auditor Guidelines 2006
a - Service Station Guidelines 1994
b- Due to the absence of locally endorsed guideline criteria, the laboratory PQL has been adopted
c - Not Detected at Limit of Reporting (NDLR)
Na – Not Applicable

Only selected VOCs (i.e. BTEX compounds) were incorporated into the analysis schedule for this ESA. A preliminary, semi-quantitative screening for VOCs was also undertaken as detailed in **Section 9.1.1**. Samples were not analysed for the more extensive list of volatile compounds as there is only limited health-based data available for assessing VOCs in soil.

7.1.6 Waste Classification Criteria for Off-Site Disposal

Any material excavated for the proposed development will require a waste classification for off-site disposal in accordance with the Waste Classification Guidelines 2009.

Soils are classed into the following categories based on the chemical contaminant criteria outlined in the guidelines (refer to Table A):

Table 7-3: Waste Categories

Category	Description
General Solid Waste (non-putrescible) (GSW)	• If SCC ≤ CT1 then TCLP not need to classify the soil as GSW • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as GSW
Restricted Solid Waste (non-putrescible) (RSW)	• If SCC ≤ CT2 then TCLP not need to classify the soil as RSW • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as RSW
Hazardous Waste (HW)	• If SCC > CT2 then TCLP not need to classify the soil as HW • If TCLP > TCLP2 and/or SCC > SCC2 then treat as HW
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • that does not contain sulfidic ores or other waste; and • includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

Note:
SCC – Specific Contaminant Concentration
CT – Contaminant Threshold
TCLP – Toxicity Characteristics Leaching Procedure

8 INVESTIGATION PROCEDURE

8.1 Soil Sampling Rationale

The NSW EPA Sampling Design Guidelines 1995 recommend a sampling density for a contamination assessment based on a systematic sampling pattern. Based on the size of the investigation area, the guidelines provide a minimum number of sampling points required for the investigation.

The guidelines recommend sampling from a minimum of fifteen evenly spaced sampling points for a site of this size (approximately 6,000m^2).

Samples for this investigation were obtained from five sampling points as shown on the attached Figure 2. This density is approximately 33% of the minimum sampling density.

The sampling locations were placed generally in random locations across the site to provide general site coverage.

Sampling was not undertaken in inaccessible areas of the site such as beneath existing buildings.

8.1.1 Soil Sampling Methods

Fieldwork for this investigation was undertaken on the 6th and 7th December 2012. Sampling locations were set out using a tape measure. Locations were marked using spray paint. The sampling locations were cleared for underground services prior to drilling.

The sample locations were drilled using a truck mounted hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.

Soil samples were collected from the fill and natural profiles encountered during the investigation. Samples were also obtained when there was a distinct change in lithology or based on the observations made during the investigation. All samples were recorded on the borehole attached in Appendix B.

During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis.

Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities. The samples were labelled with the job number, sampling location, sampling depth and date.

8.1.2 VOC Screening

A portable Photoionisation Detector (PID) was used to screen the samples for the presence of VOCs and to assist with selection of samples for BTEX analysis.

The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. Some compounds give relatively high readings and some can be undetectable even though present in identical concentrations. The portable PID is best used semi-quantitatively to compare samples contaminated by the same hydrocarbon source.

The PID is calibrated before use by measurement of an isobutylene standard gas. All the PID measurements are quoted as parts per million (ppm) isobutylene equivalents.

PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. The PID headspace data is presented on the COC documents.

8.1.3 Decontamination and Sample Preservation

Details of the decontamination procedure adopted during sampling are presented in Appendix D. Where applicable, the sampling equipment was decontaminated using a scrubbing brush and potable water and Decon 90 solution (phosphate free detergent) followed by rinsing with potable water.

Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with AS4482.1-2005 and AS4482.2-1999[30] as summarised in the following table:

Table 8-1: Soil Sample Preservation and Storage

Analyte	Preservation	Storage
Heavy metals	Unpreserved glass jar with Teflon lined lid	Store at <4°, analysis within 28 days (mercury and Cr[VI]) and 180 days (other

[30] *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part2: Volatile Substances,* Standards Australia, 1999 (AS 1999)

Analyte	Preservation	Storage
		metals).
VOCs (TPH/BTEX)	As above	Store at <4°, analysis within 14 days
PAHs, OCP, OPP & PCBs	As above	Store at <4°, analysis within 14 days
Asbestos	Sealed plastic bag	None

On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures. Field sampling protocols adopted for this assessment are summarised in Appendix D.

8.2 Laboratory Analysis

The samples were analysed by the following laboratories:

Table 8-2: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and intra-laboratory duplicate.	Envirolab Services Pty Ltd, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	82881

Samples were analysed by the laboratory using the analytical methods detailed in Schedule B(3) of NEPM (1999[31]). Reference should be made to the laboratory reports attached in Appendix B for further details.

[31] *Guideline on Laboratory Analysis of Potentially Contaminated Soils*, Schedule B(3), NEPM, 1999 (Schedule B(3))

9 INVESTIGATION RESULTS

9.1 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs attached in Appendix A for further details.

Table 9-1: Summary of Subsurface Conditions

Profile	Depth Range (mBGL[1])	Description
Fill	Minimum of 0.2m to maximum of 0.4m	Fill material was encountered at the surface and beneath the asphaltic concrete located at BH3. The fill typically comprised of silty sand. The fill contained inclusions of igneous gravel and root fibres.
Natural Soil	Minimum of 0.2m to maximum of 1.5m	Natural soil was encountered beneath the fill material in all boreholes. The natural soil typically comprised of silty clay. The fill contained inclusions of ironstone gravel and root fibres.
Bedrock	Minimum 0.9m to the maximum termination depth of 8.17m	Bedrock was encountered beneath the natural soils in all boreholes. The bedrock typically comprised of sandstone and shale.
Groundwater	2.6m to 5.6m	Groundwater seepage was encountered in BH2, BH3 and BH5. On completion of drilling BH2, groundwater was measured at a depth of approximately 5.9m. Standing water levels at cored rock borehole locations have not been relied upon due to the introduction of water associated with the core drilling process.

Note:
1 – Metres below ground level

9.1.1 VOC Screening

PID soil sample headspace readings are presented in Table B. All results were 0 ppm equivalent isobutylene which indicates a lack of PID detectable volatile organic contaminants.

9.2 Soil Laboratory Results

The soil laboratory results are presented in Table B to Table D attached to the report. The laboratory reports are presented in Appendix B. A summary of the results assessed against the SAC is presented below.

Table 9-2: Summary of Soil Laboratory Results

Analyte	Number of Samples Analysed	Results Compared to SAC and Waste Classification Guidelines
Heavy Metals	Five fill and three natural samples	All results were below the SAC. All results were below the PPILs. **WC:** All results were less than the CT1 criteria.
TPH & BTEX	Five fill and three natural samples	All results were below the SAC. **WC:** All results were less than the relevant CT1 and SCC1 criteria.
PAHs	Five fill and three natural samples	All results were below the SAC. **WC:** All results were less than the relevant CT1 and SCC1 criteria.
OCPs & OPPs	Five fill and three natural samples	All results were below the SAC. **WC:** All results were less than the relevant CT1 and SCC1 criteria.
PCBs	Five fill and three natural samples	All results were below the SAC. **WC:** All results were less than the SCC1 criteria.
Asbestos	Five fill samples	All results were below the laboratory reporting limit.

Note:
WC – Waste Classification Guidelines 2009

10 QA/QC ASSESSMENT

The QA/QC assessment includes a review of the DQIs established for the investigation (see **Section 3.2**). A summary of the field QA/QC samples are outlined below:

Table 10-1: Field QA/QC Samples

Field QA/QC	Frequency	Sample Details
Intra-laboratory duplicates	12.5% of Primary Samples	Soil Samples: Dup A is a soil duplicate of sample BH1 (0-0.1m)

An assessment of the DQIs is summarised in the following table.

Table 10-2: Assessment of DQIs

Completeness

Data and documentation completeness was achieved through the following measures:

- Preparation of sampling and analysis plan;
- Chain of custody (COC) records were prepared for each batch of samples sent to the labs (see Appendix B);
- Laboratory sample receipt information was reviewed for each batch (see Appendix B);
- NATA registered laboratories were used for all analysis;
- Visual observations and PID screening of samples was undertaken during the investigation as noted on the COC documents (see Appendix B); and
- All samples were analysed for the PCC identified in **Section 6.1**, except for VOCs which were screened using a PID.

Comparability

Data comparability was achieved through the following measures:

- Similar sampling techniques were used during the investigation;
- Appropriate preservation, storage and transport methods were adopted for all samples; and
- Consistent analysis techniques and reporting standards were adopted by the laboratories.

Representativeness

Data representativeness was achieved through the following measures:

- The sampling plan was optimised to obtain adequate coverage of sample locations; and
- The assessment included a representative coverage of analysis for PCC.

Precision

Intra-laboratory RPD Results:

The intra-laboratory soil RPD results are summarised in Table D. The results indicated that field precision was acceptable.

Accuracy

Accuracy was achieved through the following measures:

- Trained and qualified field staff were used for the investigation;
- Appropriate industry standard sampling equipment and decontamination procedures were adopted for the investigation as outlined in Appendix D;
- Sampling and screening equipment are routinely factory calibrated. An in-house calibration check was undertaken prior to using onsite;
- Appropriate sample preservation, handling, holding time and COC procedures were adopted for the investigation; and
- The report was prepared generally in accordance with Reporting Guidelines 1997

EIS note that the Envirolab Services laboratory report (Envirolab Ref:82881) commented that a number of asbestos soil samples were below the recommended sample size volume of between 40g to 50g as per AS4964-2004.

EIS are of the opinion that the asbestos analysis results are reliable enough for this preliminary Stage 1 ESA and for EIS to make a preliminary comment regarding potential asbestos contamination at the site.

Laboratory Duplicate RPD Results:

Laboratory duplicate RPD results for the soil analysis were generally within the acceptance criteria adopted by the laboratory.

Matrix Spike Recovery:

Matrix spike recovery concentrations were within the acceptable limits of 60-140% for organics and 70-130% for inorganics.

Surrogate Spike Recovery:

Surrogate spike recovery concentrations were within the acceptable limits of 60-140% for organics and 10-140% for VOCs. It is noted that surrogate concentrations were not reported in some soil samples, with the lack of results explained as matrix interference.

LCS recovery:

LCS recovery concentrations were within the acceptable limits of 60-140% for organics and 70-130% for inorganics.

The DQIs adopted for this investigation (see **Section 3.2**) have been addressed.

11 DISCUSSION

11.1 Soil

Elevated concentrations of contaminants were not encountered in the soil samples analysed for the investigation. All results were below the SAC adopted for this preliminary Stage 1 ESA.

Based on the results, EIS are of the opinion that the potential for significant widespread soil contamination at the site is relatively low.

11.1.1 Impact on Groundwater

The risk of potential groundwater contamination is considered to be very low for the following reasons:

- All fill soil results were below the SAC;
- Elevated concentrations of contaminants above the laboratory practical quantitation limits were not detected in the fill or natural soils at the site; and
- With the exception of the fill material no site specific or up gradient potential contamination sources were identified during this preliminary Stage 1 ESA.

11.2 Waste Classification

11.2.1 Classification of Fill Soil for Off-Site Disposal

The waste classification for the fill material is summarised in the following table:

Table 11-1: Waste Classification of Fill

Extent	Classification	Disposal Option
Fill material in the development area	General Solid Waste (non-putrescible) (GSW)	A facility licensed by the NSW EPA to receive the waste stream. Alternatively, the material is considered to be suitable for re-use on site provided it meet geotechnical and earthwork requirements.

Note:
1. Waste Classification Guidelines 2009

11.2.2 Classification of Natural Soil and Bedrock for Off-Site Disposal

The waste classification for the natural material is summarised in the following table:

Table 11-2: Waste Classification of Natural Material

Extent	Classification	Disposal Option
Natural silty clay soil and shale/sandstone bedrock in the development area	Virgin excavated natural material (VENM)	VENM is considered suitable for re-use on-site, or alternatively, the information included in this report may be used to assess whether the material is suitable for beneficial reuse at another site as fill material. Alternatively, the natural material can be disposed of as VENM to a facility licensed by the NSW EPA to receive the waste stream.

Material classed as VENM must not be mixed with any fill material (including building rubble) as this will invalidate the VENM classification. Where doubt exists about the difference between fill and VENM material an environmental/geotechnical engineer should be contacted.

11.2.3 Dewatering During Development

In the event groundwater is intercepted during excavation works, dewatering will be required. Council and other relevant approvals will be required prior to disposal of groundwater into the stormwater system.

11.3 Assessment of Risk

As the contamination levels in the soil samples analysed were less than the SAC, EIS consider the risk posed by contamination to the receptors identified in **Section 6.3** to be low.

11.4 Data Gaps

Due to the preliminary nature of the investigation no intrusive works were undertaken beneath the existing buildings at the site.

The number of sampling points undertaken for this ESA does not meet the minimum density recommended by the NSW EPA.

12 CONCLUSION

EIS consider that the objectives of this ESA (detailed in **Section 1.2**) and the DQOs (detailed in **Section 3**) have been addressed. Based on the scope of work undertaken, EIS consider the site to can be made suitable for the proposed development provided that the following recommendations are implemented to minimise these risks:

- A Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition works;
- Additional ESA targeting the soils beneath the buildings post demolition works; and
- Inspections during demolition and excavation work to assess any unexpected conditions or subsurface facilities that may be discovered between investigation locations. This should facilitate appropriate adjustment of the works programme and schedule in relation to the changed site conditions. Inspections should be undertaken by experienced environmental personnel.

12.1 Regulatory Requirement

The regulatory requirements applicable for the site are outlined in the following table:

Table 12-1: Regulatory Requirement

Guideline	Applicability
Duty to Report Contamination 2008[32]	The requirement to notify the NSW EPA regarding site contamination should be assessed once the results of the additional investigation work have been reviewed.
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.

[32] *Guidelines on the Duty to Report Contamination*, NSW Government Legislation, 2008 (Duty to Report Contamination 2008)

13 LIMITATIONS

The sampling locations for the investigation have enabled an assessment to be made of the risk of the existence of significant, large quantities of contamination. The conclusions based on this investigation are that, while major contamination of the site is not apparent, problems may be encountered with smaller scale features between sampling points.

EIS adopts no responsibility whatsoever for any problems such as underground storage tanks, buried items or contaminated material that may be encountered between sampling locations at the site. Development activities at the site should be planned on this basis, and any unexpected problems that may be encountered between sampling locations should be immediately inspected by experienced environmental personnel. This should ensure that such problems are dealt with in an appropriate manner, with minimal disruption to the project timetable and budget.

The conclusions developed in this report are based on site conditions which existed at the time of the investigation and the scope of work outlined in the report. They are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, and visual observations of the site and immediate surrounds, together with the interpretation of available historical information and documents reviewed as described in this report.

The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined previously in this report.

Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report.

EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report.

Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes.

Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken

with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work.

EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site.

EIS have not and will not make any determination regarding finances associated with the site.

Changes in the proposed or current site use may result in remediation or further investigation being required at the site.

During construction at the site, soil, fill and any unsuspected materials that are encountered should be monitored by qualified environmental and geotechnical engineers to confirm assumptions made on the basis of the limited investigation data, and possible changes in site level and other conditions since the investigation. Soil materials considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. Copyright in this report is the property of EIS. EIS has used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report.

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IMPORTANT INFORMATION ABOUT THIS REPORT

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

The Report is Based on a Unique Set of Project Specific Factors:
This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- the proposed land use is altered;
- the defined subject site is increased or sub-divided;
- the proposed development details including size, configuration, location, orientation of the structures are modified;
- the proposed development levels are altered, eg addition of basement levels; or
- ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (eg. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is Based on Professional Interpretations of Factual Data
Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations
Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a

rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

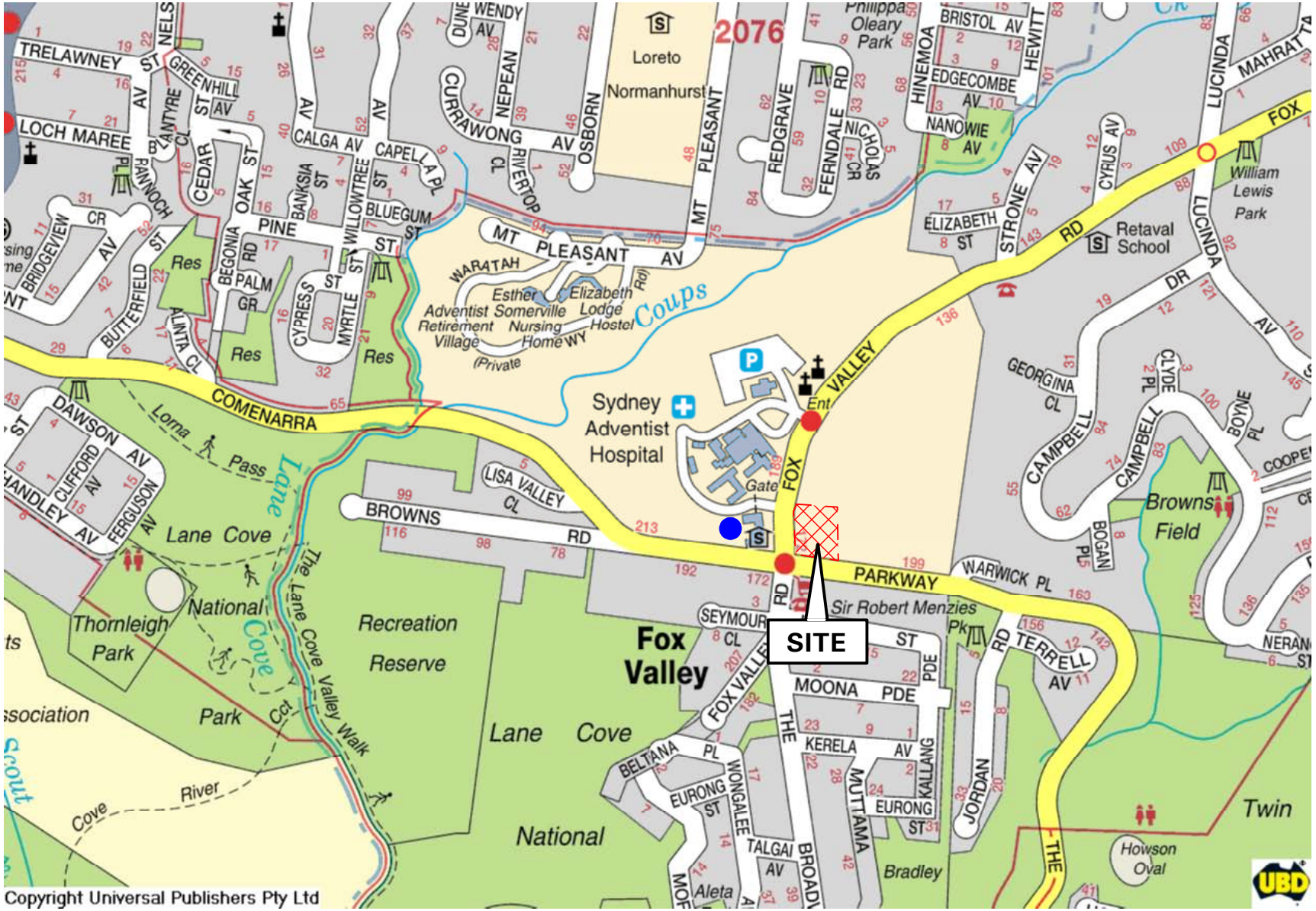
Misinterpretation of Site Assessments by Design Professionals
Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problems, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the test of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely
Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

REPORT FIGURES



NOTES:
Figure 1 has been recreated from UBD on disc (version 5.0). Figure is not to scale.

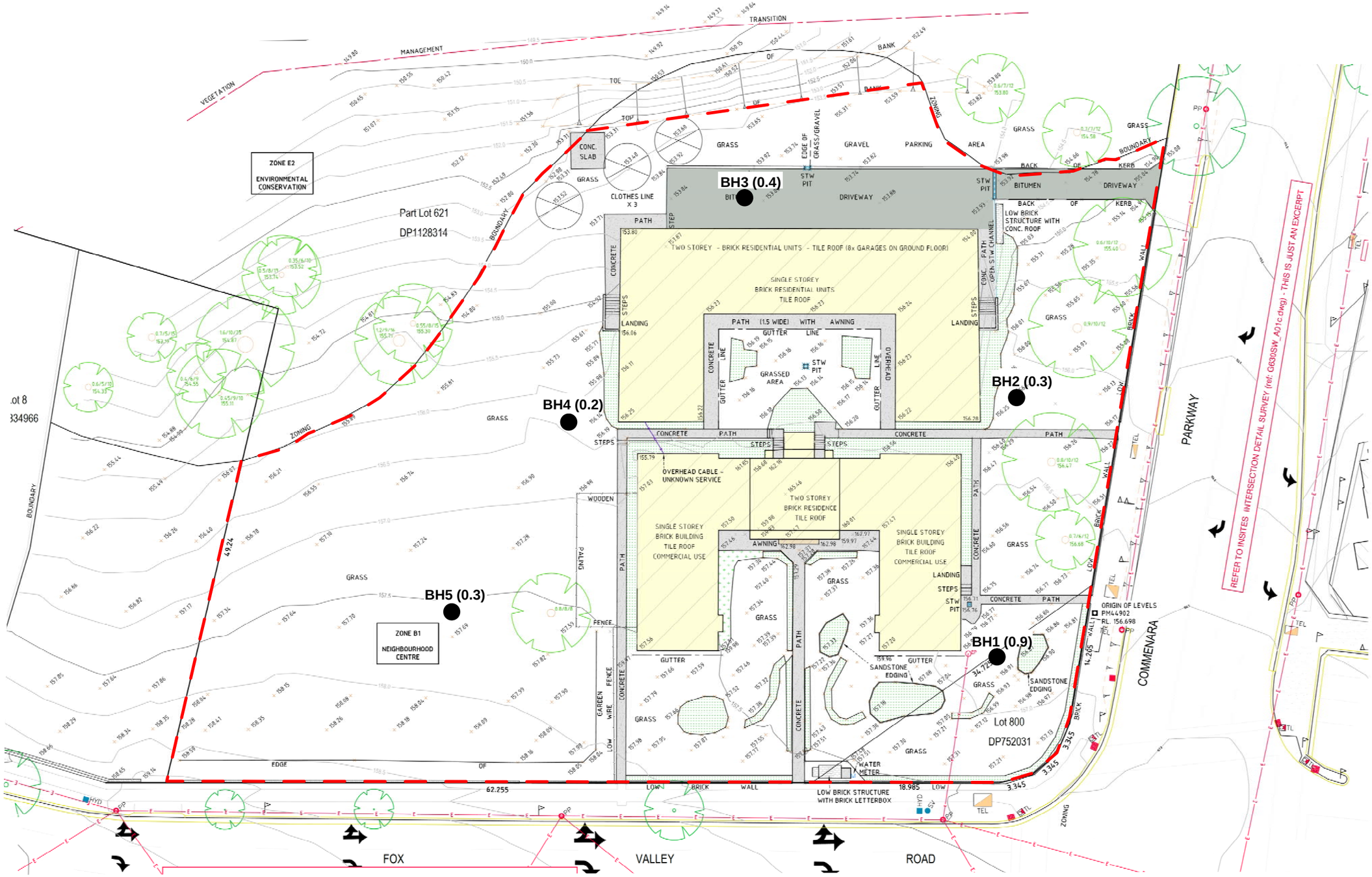
UBD Map ref: 153 H15

Reference should be made to the report text for a full understanding of this plan.

LEGEND:

Approximate slite ocation of former EIS Stage 1 ESA (EIS REF:E25803KGrpt-REV1, dated October, 2012).

EIS ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: **E26207K**	Title: **SITE LOCATION PLAN**
	Figure: **1**	Address: **CORNER COMENARRA PARKWAY &, FOX VALLEY ROAD, WAHROONGA, NSW**



LEGEND:

Approximate site boundary

BH1 (0.2) — Borehole location, number and depth of fill (m)

NOTES:

The borehole locations presented on this plan have been established from site measurements only and should not be construed as survey points.

Reference should be made to the report text for a full understanding of this plan.

Approximate Scale (m): @A3 0 4 8 12 16 20	EIS ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: E26207K	Title: BOREHOLE LOCATION PLAN
		Figure: 2	Address: CORNER COMENARRA PARKWAY &, FOX VALLEY ROAD, WAHROONGA, NSW

TABLES WITH ANALYTICAL RESULTS

TABLE A
CHEMICAL CONTAMINANT CRITERIA FOR WASTE CLASSIFICATION
Waste Classification Guidelines Part 1: Classifying Waste DECCW NSW July 2009
All data in mg/kg unless stated otherwise

CONTAMINANT	GENERAL SOLID WASTE			RESTRICTED SOLID WASTE		
	CT1 (mg/kg)	TCLP1 (mg/L)	SCC1 (mg/kg)	CT2 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)
Heavy Metals						
Arsenic	100	5	500	400	20	2,000
Beryllium	20	1	100	80	4	400
Cadmium	20	1	100	80	4	400
Chromium VI	100	5	1,900	400	20	7,600
Cyanide (total)	320	16	5,900	1280	64	23,600
Cyanide (Amenable)	70	3.5	300	280	14	1,200
Fluoride	3,000	150	10,000	12,000	600	40,000
Lead	100	5	1,500	400	20	6,000
Mercury	4	0.2	50	16	0.8	200
Molybdenum	100	5	1,000	400	20	4,000
Nickel	40	2	1,050	160	8	4,200
Selenium	20	1	50	80	4	200
Silver	100	5	180	400	20	720
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)						
Benzene	10	0.5	18	40	2	72
Toluene	288	14.4	518	1,152	57.6	2,073
Ethyl benzene	600	30	1,080	2,400	120	4,320
Total xylenes	1,000	50	1,800	4,000	200	7,200
Total Petroleum Hydrocarbons (TPHs)						
Light Fraction TPH (C6-C9)	nsl	nsl	650	nsl	nsl	2,600
Mid to Heavy Fraction TPH (C10-C36)	nsl	nsl	10,000	nsl	nsl	40,000
Polycyclic Aromatic Hydrocarbons (PAHs)						
Benzo(a)pyrene	0.8	0.04	10	3.2	0.16	23
Total PAHs	nsl	nsl	200	nsl	nsl	800
Others						
Polychlorinated biphenyls	nsl	nsl	<50	nsl	nsl	<50
Phenol (non-halogenated)	288	14.4	518	1,152	57.6	2,073
Scheduled chemicals	nsl	nsl	<50	nsl	nsl	<50

Explanation:

1). General Solid Waste (GSW):

- If SCC ≤ CT1 then TCLP not needed to classify the material as GSW
- If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as GSW

2). Restricted Solid Waste (RSW):

- If SCC ≤ CT2 then TCLP not needed to classify the material as RSW
- If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as RSW

3). Hazardous Waste (HW):

- If SCC > CT2 then TCLP not needed to classify the material as HW
- If TCLP > TCLP2 and/or SCC > SCC2 then treat as HW

Abbreviations:

SCC – Specific Contaminant Concentration
CT – Contaminant Threshold
TCLP – Toxicity Characteristics Leaching Procedure
nsl - No Set Limit
DECCW - NSW Department of Environment, Climate Change and Water (now EPA)

TABLE B
SUMMARY OF SOIL LABORATORY RESULTS
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OCPs				TOTAL OPPs	Total PCBs	TPH					BTEX COMPOUNDS				FIELD PID VALUES	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes		
PQL - Envirolab Services			4	0.5	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.5	0.5	1	3		100
Site Assessment Criteria (SAC) [1]			100	20	12%	1000	300	15	600	7000	20	1	10	50	200	10	0.1[a]	10	65[b]	nsl	nsl	nsl	1000[b]	1[b]	1.4[b]	3.1[b]	14[b]		100[c]
PPILs [2]			20	3	400	100	600	1	60	200	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl	nsl		nsl
General Solid Waste CT1 [3]			100	20	100	nsl	100	4	40	nsl	nsl	0.8	nsl	nsl	nsl	nsl	detect[4]	nsl	nsl		nsl		nsl	10	288	600	1000	-	-
General Solid Waste SCC1 [3]			500	100	1900	nsl	1500	50	1050	nsl	200	10	Scheduled Chemicals <50					50	650		nsl		10000	18	518	1080	1800	-	-
Restricted Solid Waste CT2 [3]			400	80	400	nsl	400	16	160	nsl	nsl	3.2	nsl	nsl	nsl	nsl	detect[4]	nsl	nsl		nsl		nsl	40	1152	2400	4000	-	-
Restricted Solid Waste SCC2 [3]			2000	400	7600	nsl	6000	200	4200	nsl	800	23	Scheduled Chemicals <50					50	2600		nsl		40000	72	2073	4320	7200	-	-
Sample Reference	**Sample Depth**	**Sample Description**																											
BH1	0-0.1	Fill	9	LPQL	14	13	48	LPQL	4	24	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH1	0.4-0.5	Natural	6	LPQL	13	25	24	LPQL	2	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH2	0-0.1	Fill	9	LPQL	13	20	58	LPQL	5	47	2.34	0.24	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	140	160	300	LPQL	0.7	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH2	0.4-0.5	Natural	7	LPQL	18	14	25	LPQL	3	18	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH3	0.1-0.2	Fill	6	LPQL	39	19	18	LPQL	32	30	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH3	0.4-0.5	Natural	6	LPQL	18	15	22	LPQL	5	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH4	0-0.1	Fill	6	LPQL	13	19	58	LPQL	4	53	5.54	0.54	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH5	0-0.1	Fill	7	LPQL	14	12	42	0.2	4	48	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
Total Number of samples			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0
Maximum Value			9	LPQL	39	25	58	0.2	32	53	5.54	0.54	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	140	160	300	LPQL	0.7	LPQL	LPQL	0	nc

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 1999 (NEPC Guidelines) HILs - Column A 'Residential with garden accessible soils'
2 - Provisional Phyto-toxicity Investigation Levels (PPILs)
3 - NSW DECCW Waste Classification Guidelines (2009)
b - NSW DECC Guidelines for Assessing Service Station Sites (1994)
c - The PQL has been adopted as the SAC

Concentration above the SAC ***VALUE***
Concentration above PPILs ***VALUE***

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls

UCL: Upper Level Confidence Limit on Mean Value
ALPQL: All values less than PQL
na: Not Analysed
nc: Not Calculated
nsl: No Set Limit
SAC: Site Assessment Criteria
TPH: Total Petroleum Hydrocarbons

BTEX: Monocyclic Aromatic Hydrocarbons
OCP: Organochlorine Pesticides
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure

TABLE C
SUMMARY OF SOIL LABORATORY RESULTS
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OCPs				TOTAL OPPs	Total PCBs	TPH					BTEX COMPOUNDS				FIELD PID VALUES	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes		
PQL - Envirolab Services			4	0.5	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.5	0.5	1	3		100
General Solid Waste CT1 [1]			100	20	100	nsl	100	4	40	nsl	nsl	0.8	nsl	nsl	nsl	nsl	detect [2]	nsl	nsl		nsl		nsl	10	288	600	1000	-	-
General Solid Waste SCC1 [1]			500	100	1900	nsl	1500	50	1050	nsl	200	10	Scheduled Chemicals <50					50	650		nsl		10000	18	518	1080	1800	-	-
Restricted Solid Waste CT2 [1]			400	80	400	nsl	400	16	160	nsl	nsl	3.2	nsl	nsl	nsl	nsl	detect [2]	nsl	nsl		nsl		nsl	40	1152	2400	4000	-	-
Restricted Solid Waste SCC2 [1]			2000	400	7600	nsl	6000	200	4200	nsl	800	23	Scheduled Chemicals <50					50	2600		nsl		40000	72	2073	4320	7200	-	-
Sample Reference	**Sample Depth**	**Sample Description**																											
BH1	0-0.1	Fill	9	LPQL	14	13	48	LPQL	4	24	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH1	0.4-0.5	Natural	6	LPQL	13	25	24	LPQL	2	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH2	0-0.1	Fill	9	LPQL	13	20	58	LPQL	5	47	2.34	0.24	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	140	160	300	LPQL	0.7	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH2	0.4-0.5	Natural	7	LPQL	18	14	25	LPQL	3	18	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH3	0.1-0.2	Fill	6	LPQL	39	19	18	LPQL	32	30	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH3	0.4-0.5	Natural	6	LPQL	18	15	22	LPQL	5	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	NA
BH4	0-0.1	Fill	6	LPQL	13	19	58	LPQL	4	53	5.54	0.54	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
BH5	0-0.1	Fill	7	LPQL	14	12	42	0.2	4	48	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0	No asbestos detected at reporting limit of 0.1g/kg
Total Number of samples			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0
Maximum Value			9	LPQL	39	25	58	0.2	32	53	5.54	0.54	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	140	160	300	LPQL	0.7	LPQL	LPQL	0	nc

EXPLANATION:
1 - NSW DECCW Waste Classification Guidelines (2009)

Concentration above the CT1	VALUE
Concentration above SCC1	VALUE
Concentration above the SCC2	VALUE

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls

UCL: Upper Level Confidence Limit on Mean Value
ALPQL: All values less than PQL
na: Not Analysed
nc: Not Calculated
nsl: No Set Limit
SAC: Site Assessment Criteria
TPH: Total Petroleum Hydrocarbons

BTEX: Monocyclic Aromatic Hydrocarbons
OCP: Organochlorine Pesticides
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure

TABLE D
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref =BH1 (0-0.1m)	Arsenic	4	9	10	9.5	10.5
Dup Ref = DUP A	Cadmium	0.5	LPQL	LPQL	nc	nc
	Chromium	1	14	12	13	15.4
Envirolab Report: 82881	Copper	1	13	11	12	16.7
	Lead	1	48	52	50	8.0
	Mercury	0.1	LPQL	LPQL	nc	nc
	Nickel	1	4	5	4.5	22.2
	Zinc	1	24	28	26	15.4
	Naphthalene	0.1	LPQL	LPQL	nc	nc
	Acenaphthylene	0.1	LPQL	LPQL	nc	nc
	Acenaphthene	0.1	LPQL	LPQL	nc	nc
	Fluorene	0.1	LPQL	LPQL	nc	nc
	Phenanthrene	0.1	LPQL	LPQL	nc	nc
	Anthracene	0.1	LPQL	LPQL	nc	nc
	Fluoranthene	0.1	LPQL	LPQL	nc	nc
	Pyrene	0.1	LPQL	LPQL	nc	nc
	Benzo(a)anthracene	0.1	LPQL	LPQL	nc	nc
	Chrysene	0.1	LPQL	LPQL	nc	nc
	Benzo(b)&(k)fluorant	0.2	LPQL	LPQL	nc	nc
	Benzo(a)pyrene	0.05	LPQL	LPQL	nc	nc
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	nc	nc
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	nc	nc
	Benzo(ghi)perylene	0.1	LPQL	LPQL	nc	nc
	Total OCPs	0.1	LPQL	LPQL	nc	nc
	Total OPPs	0.1	LPQL	LPQL	nc	nc
	Total PCBs	0.1	LPQL	LPQL	nc	nc
	C_6-C_9 TPH	25	LPQL	LPQL	nc	nc
	C_{10}-C_{14} TPH	50	LPQL	LPQL	nc	nc
	C_{15}-C_{28} TPH	100	LPQL	LPQL	nc	nc
	C_{29}-C_{36} TPH	100	LPQL	LPQL	nc	nc
	Benzene	0.5	LPQL	LPQL	nc	nc
	Toluene	0.5	LPQL	LPQL	nc	nc
	Ethylbenzene	1	LPQL	LPQL	nc	nc
	m+p-xylene	2	LPQL	LPQL	nc	nc
	o-xylene	1	LPQL	LPQL	nc	nc

EXPLANATION:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable
Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

RPD Results Above the Acceptance Criteria — VALUE

ABBREVIATIONS:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
na: Not Analysed
nc: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls
TPH: Total Petroleum Hydrocarbons

APPENDIX A

Borehole Logs and Explanatory Notes

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BOREHOLE LOG

Borehole No. 1
1/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 6-12-12
Method: SPIRAL AUGER
JK350
R.L. Surface: ≈ 156.9m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION OF AUGERING			0			FILL: Silty sand, fine to medium grained, brown, trace of root fibres.	D			GRASS COVER APPEARS POORLY COMPACTED
					CL	SILTY CLAY: medium plasticity, red brown, trace of fine grained ironstone gravel.	MC<PL	H		RESIDUAL
		N = 42 10,20,22								TOO FRIABLE FOR HP TESTING
			1		-	SANDSTONE: fine to medium grained, light grey.	DW	L-M		LOW TO MODERATE 'TC' BIT RESISTANCE
▼ ON COMPLETION OF CORING			2		-	SHALE: dark grey and brown.				
					-	SANDSTONE: fine to medium grained, grey and red brown.	SW	M-H		MODERATE TO HIGH RESISTANCE
			3			REFER TO CORED BOREHOLE LOG				
			4							
			5							
			6							
			7							

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CORED BOREHOLE LOG

Borehole No. **1**
2/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ | **Core Size:** NMLC | **R.L. Surface:** ≈ 156.9m
Date: 6-12-12 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK350 | **Bearing:** - | **Logged/Checked by:** O.F./J.P.

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ EL VL L M H VH EH	DEFECT DETAILS DEFECT SPACING (mm) 500 300 100 50 30 10	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		2		START CORING AT 2.78m					
FULL RET-URN		3		SANDSTONE: fine to medium grained, light grey.	FR	H			
		4							
		5				M-H			
		6							
		7				H			
		8		END OF BOREHOLE AT 7.84m					
		9							

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BOREHOLE LOG

Borehole No. **2**
1/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 6-12-12
Method: SPIRAL AUGER JK350
Logged/Checked by: O.F./J.P.
R.L. Surface: ≈ 156.2m
Datum: AHD

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
			0			FILL: Silty sand, fine to medium grained, brown, trace of root fibres.	D			GRASS COVER
					CL-CH	SILTY CLAY: medium to high plasticity, red brown, trace of fine to medium grained ironstone gravel.	MC<PL	H	>600 >600 >600	RESIDUAL
		N > 16 8,10, 6/100mm REFUSAL	1		-	SANDSTONE: fine to medium grained, light grey and brown.	DW	M		
			2			SHALE: dark grey, with ironstone bands.		L-M		LOW TO MODERATE 'TC' BIT RESISTANCE
			3			SANDSTONE: light grey and brown, with occasional high strength ironstone bands.		M-H		MODERATE TO HIGH RESISTANCE
▼ ON COMPLETION OF AUGERING			4 5 6 7			SANDSTONE: fine to medium grained, light grey.	SW	H		HIGH RESISTANCE

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BOREHOLE LOG

Borehole No. **2**
2/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 6-12-12
Method: SPIRAL AUGER JK350
R.L. Surface: ≈ 156.2m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES ES U50 DB DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						SANDSTONE: fine to medium grained, light grey.	SW	H		HIGH TO VERY HIGH RESISTANCE
						END OF BOREHOLE AT 7.4m				'TC' BIT REFUSAL
			8							
			9							
			10							
			11							
			12							
			13							
			14							

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BOREHOLE LOG

Borehole No. **3**
1/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 6-12-12
Method: SPIRAL AUGER
JK350
R.L. Surface: ≈ 153.8m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
			0			ASPHALTIC CONCRETE: 50mm.t	M			
						FILL: Silty sand, fine to medium grained, dark brown, trace of fine to medium grained igneous gravel.				
					CL-CH	SILTY CLAY: medium to high plasticity, red brown and yellow brown, trace of roots.	MC>PL	VSt	320 280 290	RESIDUAL
		N = 9 2,4,5	1							
					-	SANDSTONE: fine to medium grained, grey and brown.	DW	L-M		LOW TO MODERATE 'TC' BIT RESISTANCE
						as above, but light grey.		H		MODERATE TO HIGH RESISTANCE
▼ ON COMPLET-ION OF CORING ▶			2							
			3							
						REFER TO CORED BOREHOLE LOG				
			4							
			5							
			6							
			7							

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CORED BOREHOLE LOG

Borehole No. **3**
2/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ | **Core Size:** NMLC | **R.L. Surface:** ≈ 153.8m
Date: 6-12-12 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK350 | **Bearing:** - | **Logged/Checked by:** O.F./J.P.

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION Rock Type, grain characteristics, colour, structure, minor components.	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ EL VL L M H VH EH	DEFECT DETAILS DEFECT SPACING (mm) 500 300 100 50 30 10	DESCRIPTION Type, inclination, thickness, planarity, roughness, coating. Specific / General
		2							
		3		START CORING AT 3.15m					
				SANDSTONE: fine to medium grained, light grey and orange brown.	DW	H			- Be, 0-10°, P, S, IS - Be, 5°, P, S, IS - Be, 0-5°, P, S - XWS, 5°, 5mm.t - Be, 10°, P, R, IS - Be, 0°, P, R, IS
		4							
									- J, 45°, P, S, IS
				CORE LOSS 0.23m					
FULL RET-URN		5		SANDSTONE: fine to medium grained, grey and orange brown.	SW	H			- Be, 5°, P, S, IS
				as above, but light grey with dark grey laminae.					- 2x Be, 10°, P, S, SPACED AT 10mm
		6							
		7		END OF BOREHOLE AT 6.97m					
		8							
		9							

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BOREHOLE LOG

Borehole No. 4
1/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 7-12-12
Method: SPIRAL AUGER JK350
R.L. Surface: ≈ 156.4m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION			0			FILL: Silty sand, fine to medium grained, brown, trace of root fibres.	D			GRASS COVER
					CL-CH	SILTY CLAY: medium to high plasticity, red brown, trace of fine to medium grained ironstone gravel, trace of roots and root fibres.	MC<PL	H		RESIDUAL
		N = 16 10,8,8							>600 >600 >600	
			1							
					-	SANDSTONE: fine to medium grained, red brown.	DW	M-H		MODERATE TO HIGH 'TC' BIT RESISTANCE
			2							
						as above, but light grey.	SW			
			3							
			4					H		HIGH RESISTANCE
			5							
			6							
			7							

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BOREHOLE LOG

Borehole No. **4**
2/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 7-12-12
Method: SPIRAL AUGER
JK350
R.L. Surface: ≈ 156.4m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES ES	U50	DB	DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									SANDSTONE: fine to medium grained, light grey.	SW	H		HIGH RESISTANCE
									END OF BOREHOLE AT 7.6m				'TC' BIT REFUSAL
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No.
5
1/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ
Date: 7-12-12
Method: SPIRAL AUGER
JK350
R.L. Surface: ≈ 157.7m
Datum: AHD
Logged/Checked by: O.F./J.P.

Groundwater Record	SAMPLES (ES, U50, DB, DS)	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
			0			FILL: Silty sand, fine to medium grained, dark brown, trace of root fibres.	D			GRASS COVER APPEARS POORLY COMPACTED
					CL-CH	SILTY CLAY: medium to high plasticity, red brown, trace of ironstone gravel and root fibres.	MC<PL	H	>600 >600 >600	RESIDUAL
		SPT 10/150mm REFUSAL			-	SANDSTONE: fine to medium grained, light grey and brown.	DW	M		LOW TO MODERATE 'TC' BIT RESISTANCE
▼ ON COMPLETION OF CORING			1							
			2							
▶								M-H		MODERATE TO HIGH RESISTANCE
			3			REFER TO CORED BOREHOLE LOG				
			4							
			5							
			6							
			7							

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CORED BOREHOLE LOG

Borehole No. **5**
2/2

Client: SEVENTH-DAY ADVENTIST CHURCH SPD LTD
Project: PROPOSED SPD COMMERCIAL BUILDING
Location: CNR. COMENARRA PARKWAY AND FOX VALLEY ROAD, WAHROONGA, NSW

Job No. 26207ZJ | **Core Size:** NMLC | **R.L. Surface:** ≈ 157.7m
Date: 7-12-12 | **Inclination:** VERTICAL | **Datum:** AHD
Drill Type: JK350 | **Bearing:** - | **Logged/Checked by:** O.F./J.P.

Water Loss/Level	Barrel Lift	Depth (m)	Graphic Log	CORE DESCRIPTION (Rock Type, grain characteristics, colour, structure, minor components.)	Weathering	Strength	POINT LOAD STRENGTH INDEX $I_S(50)$ (EL VL L M H VH EH)	DEFECT DETAILS: DEFECT SPACING (mm) (500 300 100 50 30 10)	DEFECT DETAILS: DESCRIPTION (Type, inclination, thickness, planarity, roughness, coating.) Specific	General
		2		START CORING AT 2.71m						
				CORE LOSS 0.08m						
		3		SANDSTONE: fine to medium grained, light grey and red brown.	DW	M-H			- Be, 0-5°, P, S, IS - Be, 0-5°, P, S, IS - Be, 0°, P, S, IS	
		4		as above, but light grey.	SW				- J, 90°, HEALED, IS	
				CORE LOSS 0.06m						
				SANDSTONE: fine to medium grained, light grey.	SW FR	H			- Be, 0°, P, S, IS - 3xBe, 10°, P, S, IS, SPACED AT 20mm	
FULL RET-URN		5								
		6								
		7							- XWS, 20mm.t	
		8								
				END OF BOREHOLE AT 8.17m						
		9								

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REPORT EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the geotechnical report in regard to classification methods, field procedures and certain matters relating to the Comments and Recommendations section. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (eg sandy clay) as set out below:

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.06mm
Sand	0.06 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon the degree of disturbance, some information on strength and structure. Bulk samples are similar but of greater volume required for some test procedures.

Undisturbed samples are taken by pushing a thin-walled sample tube, usually 50mm diameter (known as a U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All except test pits, hand auger drilling and portable dynamic cone penetrometers require the use of a mechanical drilling rig which is commonly mounted on a truck chassis.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for an excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The location of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N>30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "N_c" on the borehole logs, together with the number of blows per 150mm penetration.

Static Cone Penetrometer Testing and Interpretation: Cone penetrometer testing (sometimes referred to as a Dutch Cone) described in this report has been carried out using an Electronic Friction Cone Penetrometer (EFCP). The test is described in Australian Standard 1289, Test F5.1.

In the tests, a 35mm diameter rod with a conical tip is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the frictional resistance on a separate 134mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are electrically connected by wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output as incremental digital records every 10mm. The results given in this report have been plotted from the digital data.

The information provided on the charts comprise:

- Cone resistance – the actual end bearing force divided by the cross sectional area of the cone – expressed in MPa.
- Sleeve friction – the frictional force on the sleeve divided by the surface area – expressed in kPa.
- Friction ratio – the ratio of sleeve friction to cone resistance, expressed as a percentage.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1% to 2% are commonly encountered in sands and occasionally very soft clays, rising to 4% to 10% in stiff clays and peats. Soil descriptions based on cone resistance and friction ratios are only inferred and must not be considered as exact.

Correlations between EFCP and SPT values can be developed for both sands and clays but may be site specific.

Interpretation of EFCP values can be made to empirically derive modulus or compressibility values to allow calculation of foundation settlements.

Stratification can be inferred from the cone and friction traces and from experience and information from nearby boreholes etc. Where shown, this information is presented for general guidance, but must be regarded as interpretive. The test method provides a continuous profile of engineering properties but, where precise information on soil classification is required, direct drilling and sampling may be preferable.

Portable Dynamic Cone Penetrometers: Portable Dynamic Cone Penetrometer (DCP) tests are carried out by driving a rod into the ground with a sliding hammer and counting the blows for successive 100mm increments of penetration.

Two relatively similar tests are used:

- Cone penetrometer (commonly known as the Scala Penetrometer) – a 16mm rod with a 20mm diameter cone end is driven with a 9kg hammer dropping 510mm (AS1289, Test F3.2). The test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various Road Authorities.
- Perth sand penetrometer – a 16mm diameter flat ended rod is driven with a 9kg hammer, dropping 600mm (AS1289, Test F3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the sub-surface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg bricks, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 *'Methods of Testing Soil for Engineering Purposes'*. Details of the test procedure used are given on the individual report forms.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building) the information and interpretation may not be relevant if the design proposal is changed (eg to a twenty storey building). If this happens, the company will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions – the potential for this will be partially dependent on borehole spacing and sampling frequency as well as investigation technique.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of persons or contractors responding to commercial pressures.

If these occur, the company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed that at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Attention is drawn to the document *'Guidelines for the Provision of Geotechnical Information in Tender Documents'*, published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Copyright in all documents (such as drawings, borehole or test pit logs, reports and specifications) provided by the Company shall remain the property of Jeffery and Katauskas Pty Ltd. Subject to the payment of all fees due, the Client alone shall have a licence to use the documents provided for the sole purpose of completing the project to which they relate. License to use the documents may be revoked without notice if the Client is in breach of any objection to make a payment to us.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/ constraints are quite complex, it is prudent to have a joint design review which involves a senior geotechnical engineer.

SITE INSPECTION

The company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

Requirements could range from:

i) a site visit to confirm that conditions exposed are no worse than those interpreted, to

ii) a visit to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, or

iii) full time engineering presence on site.

Jeffery and Katauskas Pty Ltd
CONSULTING GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

GRAPHIC LOG SYMBOLS FOR SOILS AND ROCKS

SOIL

- FILL
- TOPSOIL
- CLAY (CL, CH)
- SILT (ML, MH)
- SAND (SP, SW)
- GRAVEL (GP, GW)
- SANDY CLAY (CL, CH)
- SILTY CLAY (CL, CH)
- CLAYEY SAND (SC)
- SILTY SAND (SM)
- GRAVELLY CLAY (CL, CH)
- CLAYEY GRAVEL (GC)
- SANDY SILT (ML)
- PEAT AND ORGANIC SOILS

ROCK

- CONGLOMERATE
- SANDSTONE
- SHALE
- SILTSTONE, MUDSTONE, CLAYSTONE
- LIMESTONE
- PHYLLITE, SCHIST
- TUFF
- GRANITE, GABBRO
- DOLERITE, DIORITE
- BASALT, ANDESITE
- QUARTZITE

DEFECTS AND INCLUSIONS

- CLAY SEAM
- SHEARED OR CRUSHED SEAM
- BRECCIATED OR SHATTERED SEAM/ZONE
- IRONSTONE GRAVEL
- ORGANIC MATERIAL

OTHER MATERIALS

- CONCRETE
- BITUMINOUS CONCRETE, COAL
- COLLUVIUM

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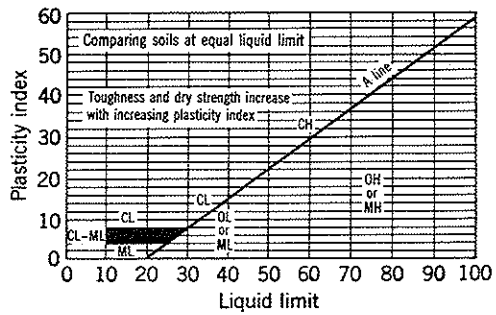
UNIFIED SOIL CLASSIFICATION TABLE

Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols a	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria		
Coarse-grained soils More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW, GP, SW, SP* More than 12% *GM, GC, SM, SC* 5% to 12% *Borderline* cases requiring use of dual symbols	$C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines			Not meeting all gradation requirements for *GW*	
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures			Atterberg limits below "A" line, or *PI* less than 4	Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures			Atterberg limits above "A" line, with *PI* greater than 7	
	Sands More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3		
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines			Not meeting all gradation requirements for *SW*	
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures			Atterberg limits below "A" line or *PI* less than 5	Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures			Atterberg limits below "A" line with *PI* greater than 7	
Fine-grained soils More than half of material is *smaller* than 75 μm sieve size (The 75 μm sieve size is about the smallest particle visible to naked eye)	Identification Procedures on Fraction Smaller than 380 μm Sieve Size								Use grain size curve in identifying the fractions as given under field identification		
	Silts and clays liquid limit less than 50		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)						
			None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)			
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity				
	Silts and clays liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts				
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays				
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity				
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils				



Plasticity chart
for laboratory classification of fine grained soils

NOTE: 1) Soils possessing characteristics of two groups are designated by combinations of group symbols (e.g. GW-GC, well graded gravel-sand mixture with clay fines).

2) Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

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LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record	—τ—	Standing water level. Time delay following completion of drilling may be shown.
	—C—	Extent of borehole collapse shortly after drilling.
	▶—	Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES	Soil sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos screening.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of Undrained Shear Strength.
	PID = 100	Photoionisation detector reading in ppm (Soil sample headspace test).
Moisture Condition (Cohesive Soils)	MC>PL	Moisture content estimated to be greater than plastic limit.
	MC≈PL	Moisture content estimated to be approximately equal to plastic limit.
	MC<PL	Moisture content estimated to be less than plastic limit.
(Cohesionless Soils)	D	DRY - runs freely through fingers.
	M	MOIST - does not run freely but no free water visible on soil surface.
	W	WET - free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT - Unconfined compressive strength less than 25kPa
	S	SOFT - Unconfined compressive strength 25-50kPa
	F	FIRM - Unconfined compressive strength 50-100kPa
	St	STIFF - Unconfined compressive strength 100-200kPa
	VSt	VERY STIFF - Unconfined compressive strength 200-400kPa
	H	HARD - Unconfined compressive strength greater than 400kPa
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)**
	VL	Very Loose <15 0-4
	L	Loose 15-35 4-10
	MD	Medium Dense 35-65 10-30
	D	Dense 65-85 30-50
	VD	Very Dense >85 >50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Tungsten carbide wing bit.
	T 60	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

Ref: Standard Sheets/Log Symbols
November 2007

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LOG SYMBOLS

ROCK MATERIAL WEATHERING CLASSIFICATION

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely weathered rock	XW	Rock is weathered to such an extent that it has "soil" properties, ie it either disintegrates or can be remoulded, in water.
Distinctly weathered rock	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by ironstaining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Slightly weathered rock	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
Fresh rock	FR	Rock shows no sign of decomposition or staining.

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining, Science and Geomechanics. Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL		Easily remoulded by hand to a material with soil properties.
		0.03	
Very Low:	VL		May be crumbled in the hand. Sandstone is "sugary" and friable.
		0.1	
Low:	L		A piece of core 150mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
		0.3	
Medium Strength:	M		A piece of core 150mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
		1	
High:	H		A piece of core 150mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
		3	
Very High:	VH		A piece of core 150mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
		10	
Extremely High:	EH		A piece of core 150mm long x 50mm dia. is very difficult to break with hand-held hammer. Rings when struck with a hammer.

ABBREVIATIONS USED IN DEFECT DESCRIPTION

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to the long core axis (ie relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Ironstained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

APPENDIX B

Laboratory Reports and Chain of Custody Documents

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 82881

Client:
Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Mitch Delaney

Sample log in details:

Your Reference:	**E26207K, Wahroongah**		
No. of samples:	11 Soils		
Date samples received / completed instructions received	10/12/2012	/	10/12/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	17/12/12	/	14/12/12
Date of Preliminary Report:	Not issued		

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Lulu Guo
Approved Signatory

Jeremy Faircloth
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/12	11/12/12	11/12/12	11/12/12	11/12/12
Date analysed	-	12/12/12	12/12/12	12/12/12	12/12/12	12/12/12
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	0.7	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	89	89	88	84

vTRH(C6-C10)/BTEXN in Soil					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/12/12	11/12/12	11/12/12	11/12/12
Date analysed	-	12/12/12	12/12/12	12/12/12	12/12/12
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	87	84	91

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	12/12/2012	12/12/2012	12/12/2012	12/12/2012	12/12/2012
TRHC_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRHC_{15} - C_{28}	mg/kg	<100	<100	140	<100	<100
TRHC_{29} - C_{36}	mg/kg	<100	<100	160	<100	<100
TRH>C_{10}-C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH>C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C_{16}-C_{34}	mg/kg	<100	<100	260	<100	<100
TRH>C_{34}-C_{40}	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	81	80	82	82	83

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	12/12/2012	12/12/2012	12/12/2012	12/12/2012
TRHC_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRHC_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRHC_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH>C_{10}-C_{16}	mg/kg	<50	<50	<50	<50
TRH>C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C_{16}-C_{34}	mg/kg	<100	<100	<100	<100
TRH>C_{34}-C_{40}	mg/kg	<100	<100	<100	<100
Surrogate o-Terphenyl	%	82	81	84	82

PAHs in Soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	0.4	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.24	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d_{14}	%	94	93	96	93	97

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- ----------	82881-6 BH3 0.4-0.5 6/12/2012 Soil	82881-7 BH4 0-0.1 7/12/2012 Soil	82881-10 BH5 0-0.1 7/12/2012 Soil	82881-11 DUPA - 7/12/2012 Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.7	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.8	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.3	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.4	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	0.9	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.54	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.3	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.4	<0.1	<0.1
Benzo(a)pyrene TEQ	mg/kg	<0.5	1	<0.5	<0.5
Surrogate p-Terphenyl-d_{14}	%	97	93	95	94

Organochlorine Pesticides in soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012	13/12/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	80	82	83	84	84

Organochlorine Pesticides in soil					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	81	86	84

Organophosphorus Pesticides						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012	13/12/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	80	82	83	84	84

Organophosphorus Pesticides					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	81	86	84

PCBs in Soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012	13/12/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	80	82	83	84	84

PCBs in Soil					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	87	81	86	84

Acid Extractable metals in soil						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Arsenic	mg/kg	9	6	9	7	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	14	13	13	18	39
Copper	mg/kg	13	25	20	14	19
Lead	mg/kg	48	24	58	25	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	2	5	3	32
Zinc	mg/kg	24	10	47	18	30

Acid Extractable metals in soil					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date digested	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Arsenic	mg/kg	6	6	7	10
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	18	13	14	12
Copper	mg/kg	15	19	12	11
Lead	mg/kg	22	58	42	52
Mercury	mg/kg	<0.1	<0.1	0.2	<0.1
Nickel	mg/kg	5	4	4	5
Zinc	mg/kg	12	53	48	28

Moisture						
Our Reference:	UNITS	82881-1	82881-2	82881-3	82881-4	82881-5
Your Reference	----------	BH1	BH1	BH2	BH2	BH3
Depth	----------	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0.1-0.2
Date Sampled		6/12/2012	6/12/2012	6/12/2012	6/12/2012	6/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	12/12/2012	12/12/2012	12/12/2012	12/12/2012	12/12/2012
Moisture	%	9.0	13	9.5	18	10

Moisture					
Our Reference:	UNITS	82881-6	82881-7	82881-10	82881-11
Your Reference	----------	BH3	BH4	BH5	DUPA
Depth	----------	0.4-0.5	0-0.1	0-0.1	-
Date Sampled		6/12/2012	7/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	11/12/2012	11/12/2012	11/12/2012	11/12/2012
Date analysed	-	12/12/2012	12/12/2012	12/12/2012	12/12/2012
Moisture	%	16	11	15	7.4

Asbestos ID - soils						
Our Reference:	UNITS	82881-1	82881-3	82881-5	82881-7	82881-10
Your Reference	----------	BH1	BH2	BH3	BH4	BH5
Depth	----------	0-0.1	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		6/12/2012	6/12/2012	6/12/2012	7/12/2012	7/12/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/12/2012	13/12/2012	13/12/2012	13/12/2012	13/12/2012
Sample mass tested	g	Approx 10g	Approx 10g	Approx 20g	Approx 10g	Approx 10g
Sample Description	-	Brown fine-grained soil & organic debris	Brown fine-grained soil & organic debris	Beige fine-grained clay soil	Brown fine-grained soil & clay	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 draft Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 draft Guideline on Investigation Levels for Soil and Groundwater.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM draft B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/12	82881-1	11/12/12 || 11/12/12	LCS7	11/12/12
Date analysed	-			12/12/12	82881-1	12/12/12 || 12/12/12	LCS7	12/12/12
TRHC_6 - C_9	mg/kg	25	Org-016	<25	82881-1	<25 || <25	LCS7	97%
TRHC_6 - C_{10}	mg/kg	25	Org-016	<25	82881-1	<25 || <25	LCS7	97%
vTPHC_6 - C_{10} less BTEX (F1)	mg/kg	25	Org-016	[NT]	82881-1	<25 || <25	[NR]	[NR]
Benzene	mg/kg	0.2	Org-016	<0.2	82881-1	<0.2 || <0.2	LCS7	92%
Toluene	mg/kg	0.5	Org-016	<0.5	82881-1	<0.5 || <0.5	LCS7	94%
Ethylbenzene	mg/kg	1	Org-016	<1	82881-1	<1 || <1	LCS7	97%
m+p-xylene	mg/kg	2	Org-016	<2	82881-1	<2 || <2	LCS7	102%
o-Xylene	mg/kg	1	Org-016	<1	82881-1	<1 || <1	LCS7	102%
naphthalene	mg/kg	1	Org-014	<1	82881-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	90	82881-1	90 || 85 || RPD: 6	LCS7	88%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Date analysed	-			12/12/2012	82881-1	12/12/2012 || 12/12/2012	LCS-7	12/12/2012
TRHC_{10} - C_{14}	mg/kg	50	Org-003	<50	82881-1	<50 || <50	LCS-7	73%
TRHC_{15} - C_{28}	mg/kg	100	Org-003	<100	82881-1	<100 || <100	LCS-7	89%
TRHC_{29} - C_{36}	mg/kg	100	Org-003	<100	82881-1	<100 || <100	LCS-7	82%
TRH>C_{10}-C_{16}	mg/kg	50	Org-003	<50	82881-1	<50 || <50	LCS-7	73%
TRH>C_{10} - C_{16} less Naphthalene (F2)	mg/kg	50	Org-003	[NT]	82881-1	<50 || <50	[NR]	[NR]
TRH>C_{16}-C_{34}	mg/kg	100	Org-003	<100	82881-1	<100 || <100	LCS-7	89%
TRH>C_{34}-C_{40}	mg/kg	100	Org-003	<100	82881-1	<100 || <100	LCS-7	82%
Surrogate o-Terphenyl	%		Org-003	81	82881-1	81 || 81 || RPD: 0	LCS-7	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Date analysed	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	98%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	94%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	97%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	93%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	95%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	LCS-7	93%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	82881-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	82881-1	<0.05 || <0.05	LCS-7	96%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Benzo(a)pyrene TEQ	mg/kg	0.5	Org-012 subset	[NT]	82881-1	<0.5 || <0.5	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	93	82881-1	94 || 95 || RPD: 1	LCS-7	87%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Date analysed	-			13/12/2012	82881-1	13/12/2012 || 13/12/2012	LCS-7	13/12/2012
HCB	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	80%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	85%
Heptachlor	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	80%
delta-BHC	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	81%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	84%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	85%
Dieldrin	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	86%
Endrin	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	84%
pp-DDD	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	87%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	LCS-7	83%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	83	82881-1	80 || 84 || RPD: 5	LCS-7	85%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Date analysed	-			13/12/2012	82881-1	13/12/2012 || 13/12/2012	LCS-7	13/12/2012
Diazinon	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	LCS-7	88%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	LCS-7	96%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	82881-1	<0.1 || <0.1	LCS-7	86%
Surrogate TCMX	%		Org-008	83	82881-1	80 || 84 || RPD: 5	LCS-7	81%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-7	11/12/2012
Date analysed	-			13/12/2012	82881-1	13/12/2012 || 13/12/2012	LCS-7	13/12/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	LCS-7	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	82881-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	83	82881-1	80 || 84 || RPD: 5	LCS-7	79%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-1	11/12/2012
Date analysed	-			11/12/2012	82881-1	11/12/2012 || 11/12/2012	LCS-1	11/12/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	82881-1	9 || 9 || RPD: 0	LCS-1	93%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	82881-1	<0.5 || <0.5	LCS-1	94%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	82881-1	14 || 12 || RPD: 15	LCS-1	95%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	82881-1	13 || 12 || RPD: 8	LCS-1	96%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	82881-1	48 || 44 || RPD: 9	LCS-1	94%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	82881-1	<0.1 || <0.1	LCS-1	100%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	82881-1	4 || 3 || RPD: 29	LCS-1	94%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	82881-1	24 || 23 || RPD: 4	LCS-1	95%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	82881-3	11/12/12 || 11/12/12	82881-2	11/12/12
Date analysed	-	82881-3	12/12/12 || 12/12/12	82881-2	12/12/12
TRHC_6 - C_9	mg/kg	82881-3	<25 || <25	82881-2	116%
TRHC_6 - C_{10}	mg/kg	82881-3	<25 || <25	82881-2	116%
vTPHC_6 - C_{10} less BTEX (F1)	mg/kg	82881-3	<25 || <25	[NR]	[NR]
Benzene	mg/kg	82881-3	<0.2 || <0.2	82881-2	118%
Toluene	mg/kg	82881-3	0.7 || 0.6 || RPD: 15	82881-2	116%
Ethylbenzene	mg/kg	82881-3	<1 || <1	82881-2	104%
m+p-xylene	mg/kg	82881-3	<2 || <2	82881-2	120%
o-Xylene	mg/kg	82881-3	<1 || <1	82881-2	123%
naphthalene	mg/kg	82881-3	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	82881-3	89 || 103 || RPD: 15	82881-2	88%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	12/12/2012
TRHC_{10} - C_{14}	mg/kg	[NT]	[NT]	82881-2	76%
TRHC_{15} - C_{28}	mg/kg	[NT]	[NT]	82881-2	95%
TRHC_{29} - C_{36}	mg/kg	[NT]	[NT]	82881-2	83%
TRH>C_{10}-C_{16}	mg/kg	[NT]	[NT]	82881-2	76%
TRH>C_{10} - C_{16} less Naphthalene (F2)	mg/kg	[NT]	[NT]	[NR]	[NR]
TRH>C_{16}-C_{34}	mg/kg	[NT]	[NT]	82881-2	95%
TRH>C_{34}-C_{40}	mg/kg	[NT]	[NT]	82881-2	83%
Surrogate o-Terphenyl	%	[NT]	[NT]	82881-2	103%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	11/12/2012
Naphthalene	mg/kg	[NT]	[NT]	82881-2	102%
Acenaphthylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	[NT]	[NT]	82881-2	97%
Phenanthrene	mg/kg	[NT]	[NT]	82881-2	102%
Anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	[NT]	[NT]	82881-2	99%
Pyrene	mg/kg	[NT]	[NT]	82881-2	101%
Benzo(a)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	[NT]	[NT]	82881-2	98%
Benzo(b+k)fluoranthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	[NT]	[NT]	82881-2	103%
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene TEQ	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%	[NT]	[NT]	82881-2	89%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	13/12/2012
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	82881-2	82%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	82881-2	84%
Heptachlor	mg/kg	[NT]	[NT]	82881-2	82%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	82881-2	84%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	82881-2	88%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	82881-2	86%
Dieldrin	mg/kg	[NT]	[NT]	82881-2	88%
Endrin	mg/kg	[NT]	[NT]	82881-2	86%
pp-DDD	mg/kg	[NT]	[NT]	82881-2	88%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	82881-2	84%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	82881-2	84%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	13/12/2012
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	82881-2	91%
Fenitrothion	mg/kg	[NT]	[NT]	82881-2	103%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	82881-2	99%
Surrogate TCMX	%	[NT]	[NT]	82881-2	88%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	13/12/2012
Arochlor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	[NT]	[NT]	82881-2	101%
Arochlor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	82881-2	86%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	82881-2	11/12/2012
Date analysed	-	[NT]	[NT]	82881-2	11/12/2012
Arsenic	mg/kg	[NT]	[NT]	82881-2	85%
Cadmium	mg/kg	[NT]	[NT]	82881-2	91%
Chromium	mg/kg	[NT]	[NT]	82881-2	96%
Copper	mg/kg	[NT]	[NT]	82881-2	94%
Lead	mg/kg	[NT]	[NT]	82881-2	91%
Mercury	mg/kg	[NT]	[NT]	82881-2	91%
Nickel	mg/kg	[NT]	[NT]	82881-2	91%
Zinc	mg/kg	[NT]	[NT]	82881-2	89%

Report Comments:

Asbestos:

All samples analysed as received. However, samples are below the recommended volume of 40-50g (50mL) as per AS4964-2004. This insufficient sample size may lead to inaccurate interpretation of the result as it may not be representative of the sampled area.

Asbestos ID was analysed by Approved Identifier:	Lulu Guo
Asbestos ID was authorised by Approved Signatory:	Lulu Guo

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC NSW 1670

ph: 02 9888 5000
Fax: 02 9888 5001

Attention: Mitch Delaney

Sample log in details:

Your reference:	**E26207K, Wahroongah**
Envirolab Reference:	**82881**
Date received:	10/12/2012
Date results expected to be reported:	**17/12/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	11 Soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

SAMPLE AND CHAIN OF CUSTODY FORM

TO:
Envirolab Services Pty Ltd
12 Ashley Street
Chatswood NSW 2067
Phone: (02) 99106200
Fax: (02) 99106201

Attention: Aileen

EIS Job Number: E26207K

Date Results Required: Standard

Sheet 1 / 1

FROM:
Environmental Investigation Services
Rear 115 Wicks Road
Macquarie Park NSW 2113
Phone: (02) 9888 5000
Fax: (02) 9888 5004

Contact: Mitch Delaney

Project: Proposed commercial building
Location: Wahroongah
Sampler: ~~Mitch Delaney~~ OF

Sample Preservation: In esky on ice

Tests Required

Date Sampled	Lab Ref:	Borehole/ Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6	Combo 6a	Combo 13	8 Metals	TPH	BTEX	PAHs	OCP/OPP/ PCBs	Asbestos	TCLP 6 Metals	TCLP PAHs	
6/12/12	1	BH1	0-0.1	Glass jar + Asb Bag	0	Fill		X										
↑	2	BH1	0.4-0.5	Glass jar + Asb Bag	0	Nat	X											
	3	BH2	0-0.1	Glass jar + Asb Bag	0	Fill		X										
	4	BH2	0.4-0.5	Glass jar + Asb Bag	0	Nat	X											
↓	5	BH3	0.1-0.2	Glass jar + Asb Bag	0	Fill		X										
6/12/12	6	BH3	0.4-0.5	Glass jar + Asb Bag	0	Nat	X											
7/12/12	7	BH4	0-0.1	Glass jar + Asb Bag	0	Fill		X										
↑	8	BH4	0.4-0.5	Glass jar + Asb Bag	0	Nat												
	9	BH4	1.0-1.2	Glass jar + Asb Bag	0	Nat												
↓	10	BH5	0-0.1	Glass jar + Asb Bag	0	Fill		X										
–	11	DUPA	–	Glass jar + Asb Bag	0	Soil	X											
				Glass jar + Asb Bag														
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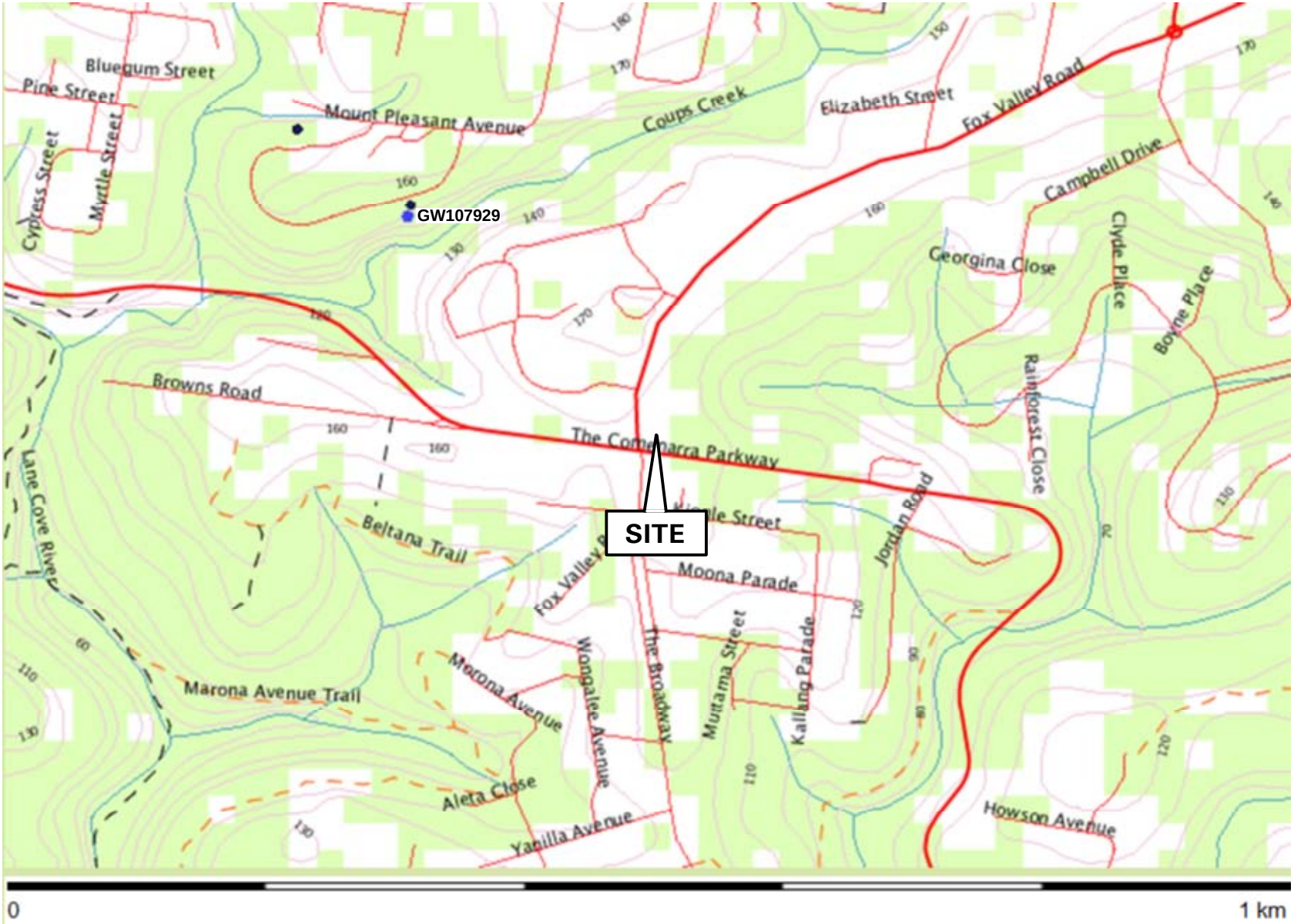
ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 82881
Date Received: 10.12.12
Time Received: 15:05
Received by: O.B.L.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required): please email results to Mitch Delaney

Relinquished By:	Date:	Time:	Received By:	
MD	10/12/12		O.B.L.	10.12.12

APPENDIX C1

Groundwater Bore Records



NOTES:
Figure 1 has been recreated from UBD on disc (version 5.0). Figure is not to scale.

UBD Map ref: 153 H15

Reference should be made to the report text for a full understanding of this plan.

EIS ENVIRONMENTAL INVESTIGATION SERVICES	Project Number: **E26207K**	Title: **SITE LOCATION PLAN**
	Figure: **1**	Address: **CORNER COMENARRA PARKWAY &, FOX VALLEY ROAD, WAHROONGA, NSW**

Groundwater Works Summary

For information on the meaning of fields please see Glossary
Document Generated on Tuesday, December 11, 2012

Print Report

Works Details Site Details Form A Licensed Construction Water Bearing Zones Drillers Log

Work Requested -- GW107929

Works Details (top)

GROUNDWATER NUMBER	GW107929
LIC-NUM	10WA109473
AUTHORISED-PURPOSES	RECREATION (GROUNDWATER)
INTENDED-PURPOSES	RECREATION (GROUNDWATER)
WORK-TYPE	Bore
WORK-STATUS	
CONSTRUCTION-METHOD	Rotary
OWNER-TYPE	
COMMENCE-DATE	
COMPLETION-DATE	2005-03-18
FINAL-DEPTH (metres)	180.00
DRILLED-DEPTH (metres)	180.00
CONTRACTOR-NAME	
DRILLER-NAME	
PROPERTY	AUSTRALASIAN CONFERENCE ASSOC.
GWMA	-
GW-ZONE	-
STANDING-WATER-LEVEL	58.00
SALINITY	1800.00
YIELD	0.10

Site Details (top)

REGION	10 - SYDNEY SOUTH COAST
RIVER-BASIN	
AREA-DISTRICT	
CMA-MAP	
GRID-ZONE	
SCALE	
ELEVATION	
ELEVATION-SOURCE	
NORTHING	6265935.00
EASTING	323621.00
LATITUDE	33 43' 55"
LONGITUDE	151 5' 46"
GS-MAP	

AMG-ZONE	56
COORD-SOURCE	
REMARK	

Form-A (top)

COUNTY	CUMBERLAND
PARISH	GORDON
PORTION-LOT-DP	62 1017514

Licensed (top)

COUNTY	CUMBERLAND
PARISH	GORDON
PORTION-LOT-DP	621 1128314

Construction (top)

Negative depths indicate Above Ground Level;H-Hole;P-Pipe;OD-Outside Diameter;
ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity

HOLE-NO	PIPE-NO	COMPONENT-CODE	COMPONENT-TYPE	DEPTH-FROM (metres)	DEPTH-TO (metres)	OD (mm)	ID (mm)	INTERVAL	DETAIL
1		Hole	Hole	0.00	2.50	206			Down Hole Hammer
1		Hole	Hole	2.50	180.00	162			Down Hole Hammer
1	1	Casing	Steel	-0.50	5.50	162	152.4		C: -.1-5.5m; Driven into Hole
1	1	Casing	PVC Class 9	-0.50	23.50	140			Screwed and Glued; Suspended in Clamps

Water Bearing Zones (top)

FROM-DEPTH (metres)	TO-DEPTH (metres)	THICKNESS (metres)	ROCK-CAT-DESC	S-W-L	D-D-L	YIELD	TEST-HOLE-DEPTH (metres)	DURATION	SALINITY
73.00	74.50	1.50				0.15	78.00	0.25	1188.00
117.00	117.20	0.20		58.00		0.25	120.00	0.25	1715.00
133.00	135.00	2.00				0.25	150.00	0.25	1677.00
153.00	156.50	3.50				0.10	180.00	0.25	1800.00

Drillers Log (top)

FROM	TO	THICKNESS	DESC	GEO-MATERIAL	COMMENT
0.00	16.00	16.00	SANDSTONE L./B		
16.00	17.00	1.00	SANDSTONE,FRACTURED, SOFT		
17.00	35.00	18.00	SANDSTONE GREY		
35.00	35.50	0.50	SHALE		
35.50	73.00	37.50	SANDSTONE GREY		
73.00	74.50	1.50	SANDSTONE FINE QUARTZ		
74.50	83.00	8.50	SANDSTONE GREY		
83.00	88.00	5.00	SANDSTONE D/G		
88.00	92.00	4.00	SANDSTONE GREY		
92.00	92.50	0.50	SANDSTONE F/Q		
92.50	117.00	24.50	SANDSTONE D/G		

117.00	117.20	0.20	SANDSTONE FRACTURED
117.20	124.00	6.80	SANDSTONE GREY
124.00	124.50	0.50	SANDSTONE F/Q
124.50	133.00	8.50	SANDSTONE GREY
133.00	135.00	2.00	SANDSTONE / QUARTZ
135.00	153.00	18.00	SANDSTONE GREY
153.00	156.50	3.50	SANDSTOHNE FINE QUARTZ
156.50	180.00	23.50	SANDSTONE GREY

Warning To Clients: This raw data has been supplied to the Department of Infrastructure, Planning and Natural Resources (DIPNR) by drillers, licensees and other sources. The DIPNR does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

APPENDIX C2

Site History Documents – Historical Land Title Records

Advance Legal Searchers Pty Ltd hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act.

Information provided through Tri-Search an approved LPI*NSW* Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314

SEARCH DATE	TIME	EDITION NO	DATE
12/7/2012	6:59 PM	11	10/7/2012

LAND

LOT 621 IN DEPOSITED PLAN 1128314
AT WAHROONGA
LOCAL GOVERNMENT AREA HORNSBY, KU-RING-GAI
PARISH OF GORDON COUNTY OF CUMBERLAND
PARISH OF SOUTH COLAH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1128314

FIRST SCHEDULE

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

SECOND SCHEDULE (55 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 C141593 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3 B830204 EASEMENT FOR NATURAL WATERCOURSE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 B830204 EASEMENT FOR DRAINAGE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 J221147 EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 J221147 CONSTRUCTION EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 K610315 EASEMENT FOR WATER SUPPLY WORKS 3.05 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 DP640633 DRAINAGE EASEMENT 2.5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 X843857 LEASE TO SYDNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO 6435 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH X843857. EXPIRES 31.12.2037
10 O251457 LEASE TO SYDNEY ELECTRICITY OF SUBSTATION PREMISES NO.7241 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH O251457. EXPIRES 28.2.2045
11 3301465 LEASE TO ENERGY AUSTRALIA OF SUBSTATION PREMISES NO.7484 TOGETHER WITH RIGHT OF WAY & EASEMENT SHOWN IN PLAN WITH 3301465. EXPIRES 31.8.2046

END OF PAGE 1 - CONTINUED OVER

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 2

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

12 5431961 LEASE TO OPTUS MOBILE PTY LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH 5431961. COMMENCES 31/3/2009. EXPIRES: 30/3/2014.

13 DP1017514 EASEMENT TO DRAIN WATER 1 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

14 AA95145 LEASE TO DR ARTHUR RICHARDSON PTY LTD OF SUITE 503, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.

15 AA177677 LEASE TO CUNDLE MANAGEMENT SERVICES PTY LIMITED OF SUITE 505, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.

16 AA478792 LEASE TO GREGORY BRUCE BENNETT (SEE AB940557) OF SUITE 604, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 3/8/2008. OPTION OF RENEWAL: 5 YEARS.

17 AB624793 EASEMENT FOR ELECTRICITY SUBSTATION AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

18 AB624793 RIGHT OF WAY AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

19 AB624793 EASEMENT FOR ELECTRICITY PURPOSES AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

20 AC352261 LEASE TO JDG WATSON PTY LTD OF SUITE 402 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

21 AC352262 LEASE TO HOAM PTY LTD OF SUITE 401 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

22 AC366463 LEASE TO SPECIALIST ONCOLOGY SERVICES PTY LTD OF SUITES 301 AND 302, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

23 AC366464 LEASE TO NORTHERN SURGICAL ONCOLOGY PTY LTD OF SUITE 404, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF FIVE YEARS.

24 AC484401 EASEMENT FOR ELECTRICITY SUBSTATION PURPOSES 5.33 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

25 AC484401 EASEMENT FOR ELECTRICITY PURPOSES 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

26 AC484401 RIGHT OF WAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

27 AD900986 LEASE TO TELSTRA CORPORATION LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH AD900986. EXPIRES:

END OF PAGE 2 - CONTINUED OVER

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 3

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

30/6/2012. OPTION OF RENEWAL: 5 YEARS.

28 AD990739 LEASE TO SIMON TAYLOR OF SUITE 303 OF "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 19/3/2011. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

29 AE798309 LEASE TO R J MOBBS & ASSOCIATES PTY LTD OF THE POON CHILDCARE CENTRE, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/3/2013.

AE888133 MORTGAGE OF LEASE AE798309 TO BANK OF WESTERN AUSTRALIA LIMITED

30 AE798310 LEASE TO YEW TREE MANAGEMENT PTY LTD OF SUITE 304, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 26/8/2013.

31 AE798311 LEASE TO BRAMJO PTY LTD OF SUITE 307, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 30/6/2013. OPTION OF RENEWAL: 5 YEARS.

32 AE798312 LEASE TO MELISSA DOOHAN OF SUITE 504, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

33 AE798313 LEASE TO THOMAS DEAN PTY LIMITED OF SUITE 506, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2013.

34 AE798314 LEASE TO ELIOT JAY ROACH OF SUITE 511, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

35 AE798315 LEASE TO MADELEINE GIUTRONICH OF SUITE 601C, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

36 AE798316 LEASE TO BONE RECONSTRUCTION PTY LIMITED OF SUITE 601D, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

37 AE798317 LEASE TO DR R. & S. L. KIRSOP PTY LIMITED OF SUITE 605, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

38 AE798318 LEASE TO PACIFIC CARDIOLOGY SERVICES PTY LIMITED OF SUITE 502, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

39 AE798319 LEASE TO SCOTT BUTLER SIMPSON OF SUITE 510, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 29/7/2013.

40 AE893573 LEASE TO VODAFONE NETWORK PTY LIMITED OF THE PART OF THE ROOF SHOWN HATCHED IN PLAN WITH U990412 EXCLUDING THE PART SHOWN HATCHED IN PLAN WITH 5532722. EXPIRES: 30/3/2014.

41 AE968338 LEASE TO MAXIVEND PTY LTD OF SUITE 601A, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

END OF PAGE 3 - CONTINUED OVER

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 4

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

42 AE968339 LEASE TO WESTERN SYDNEY ORTHOPAEDIC ASSOCIATES PTY LIMITED OF SUITE 601B, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

43 AE968340 LEASE TO SPECIALIST CARDIOLOGY PTY LIMITED OF SUITE 603, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2013.

44 AE968341 LEASE TO ROBERT JAMES HARDWICK OF SUITE 606, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 24/7/2013.

45 AE968342 LEASE TO NORTHSIDE PHYSIO NO.2 PTY LIMITED OF SUITE 602, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 19/10/2013.

46 AF33418 LEASE TO MATTHEW JOSEPH MCNAMARA BEING THE PREMISES KNOWN AS SUITE 501, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2013.

47 AF33419 LEASE TO STUART GRENVILLE KIRKHAM BEING PREMISES KNOWN AS SUITE 508, THE SANS CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 22/7/2013.

48 AF160098 LEASE TO GRAHAM DOUGLAS SELLARS OF SUITE 507, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2013.

49 AF160099 LEASE TO GEOFFREY HOWARD PAUL OF SUITE 509, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 30/6/2013.

50 AF747934 LEASE TO MCHARG NOMINEES PTY LIMITED OF SUITE 306, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2017. OPTION OF RENEWAL: 7 YEARS.

51 AG116120 LEASE TO NORTHERN HAEMATOLOGY & ONCOLOGY GROUP PTY LIMITED OF SUITE 403, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 31/12/2015. OPTION OF RENEWAL: 5 YEARS.

52 AG178861 LEASE TO SYDNEY UROLOGICAL ASSOCIATES PTY LIMITED OF SUITE 406, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 30/10/2015. OPTION OF RENEWAL: 5 YEARS.

53 DP1170796 EASEMENT FOR ELECTRICITY & OTHER PURPOSES VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1170796

54 DP1170796 RIGHT OF CARRIAGEWAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1170796

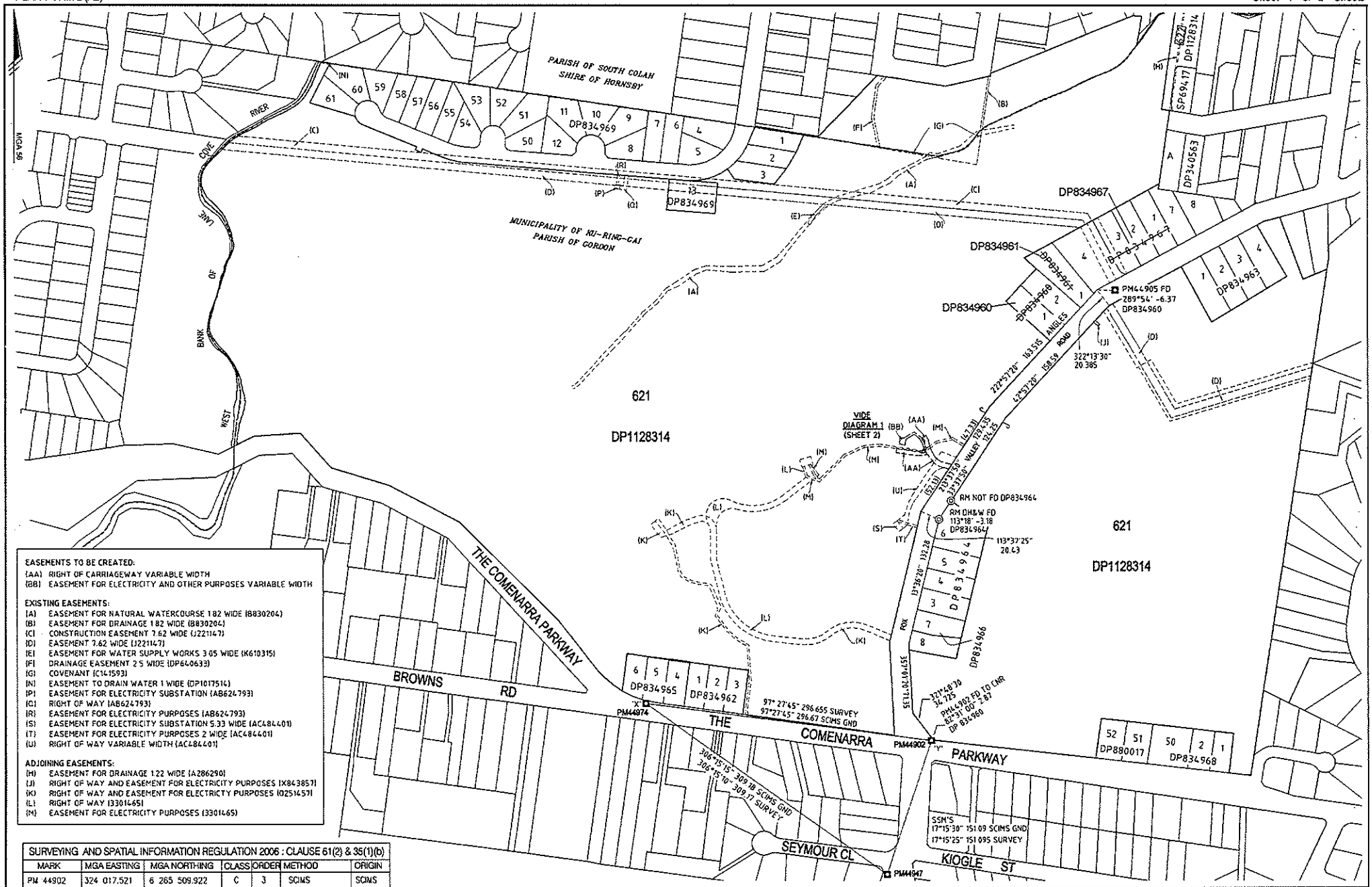
55 AH101094 MORTGAGE TO NATIONAL AUSTRALIA BANK LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.



EASEMENTS TO BE CREATED:
(AA) RIGHT OF CARRIAGEWAY VARIABLE WIDTH
(BB) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES VARIABLE WIDTH

EXISTING EASEMENTS:
(A) EASEMENT FOR NATURAL WATERCOURSE 182 WIDE (B830204)
(B) EASEMENT FOR DRAINAGE 182 WIDE (B830204)
(C) CONSTRUCTION EASEMENT 7.62 WIDE (J221147)
(D) EASEMENT 7.62 WIDE (J221147)
(E) EASEMENT FOR WATER SUPPLY WORKS 3.05 WIDE (K610315)
(F) DRAINAGE EASEMENT 2.5 WIDE (DP640633)
(G) COVENANT (C141593)
(N) EASEMENT TO DRAIN WATER 1 WIDE (DP1017514)
(P) EASEMENT FOR ELECTRICITY SUBSTATION (AB624793)
(Q) RIGHT OF WAY (AB624793)
(R) EASEMENT FOR ELECTRICITY PURPOSES (AB624793)
(S) EASEMENT FOR ELECTRICITY SUBSTATION 5.33 WIDE (AC484401)
(T) EASEMENT FOR ELECTRICITY PURPOSES 2 WIDE (AC484401)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

ADJOINING EASEMENTS:
(H) EASEMENT FOR DRAINAGE 1.22 WIDE (A286290)
(J) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (X843857)
(K) RIGHT OF WAY AND EASEMENT FOR ELECTRICTY PURPOSES (D251457)
(L) RIGHT OF WAY (3301465)
(M) EASEMENT FOR ELECTRICITY PURPOSES (3301465)

SURVEYING AND SPATIAL INFORMATION REGULATION 2006 : CLAUSE 61(2) & 35(1)(b)

MARK	MGA EASTING	MGA NORTHING	CLASS	ORDER	METHOD	ORIGIN
PM 44902	324 017.521	6 265 509.922	C	3	SCIMS	SCIMS
PM 44947	323 972.697	6 265 365.634	B	2	SCIMS	SCIMS
PM 44974	323 723.379	6 265 548.452	B	2	SCIMS	SCIMS

COMBINED SCALE FACTOR = 0.999955 ZONE 56

SOURCE: M.G.A. CO-ORDINATES AND SCALE FACTOR ADOPTED FROM SCIMS ON THE 21st July 2011

Surveyor : Brian Franklin
Date of Survey : 28 July 2011
Surveyor's Ref : F691SW_S01c

PLAN FOR
EASEMENT PURPOSES WITHIN
LOT 621 DP 1128314

LGA : KU-RING-GAI, HORNSBY
Locality : WAHROONGA
Subdivision No : ——
Lengths are in metres. Reduction Ratio 1 : 2500

Registered
1.5.2012

DP1170796

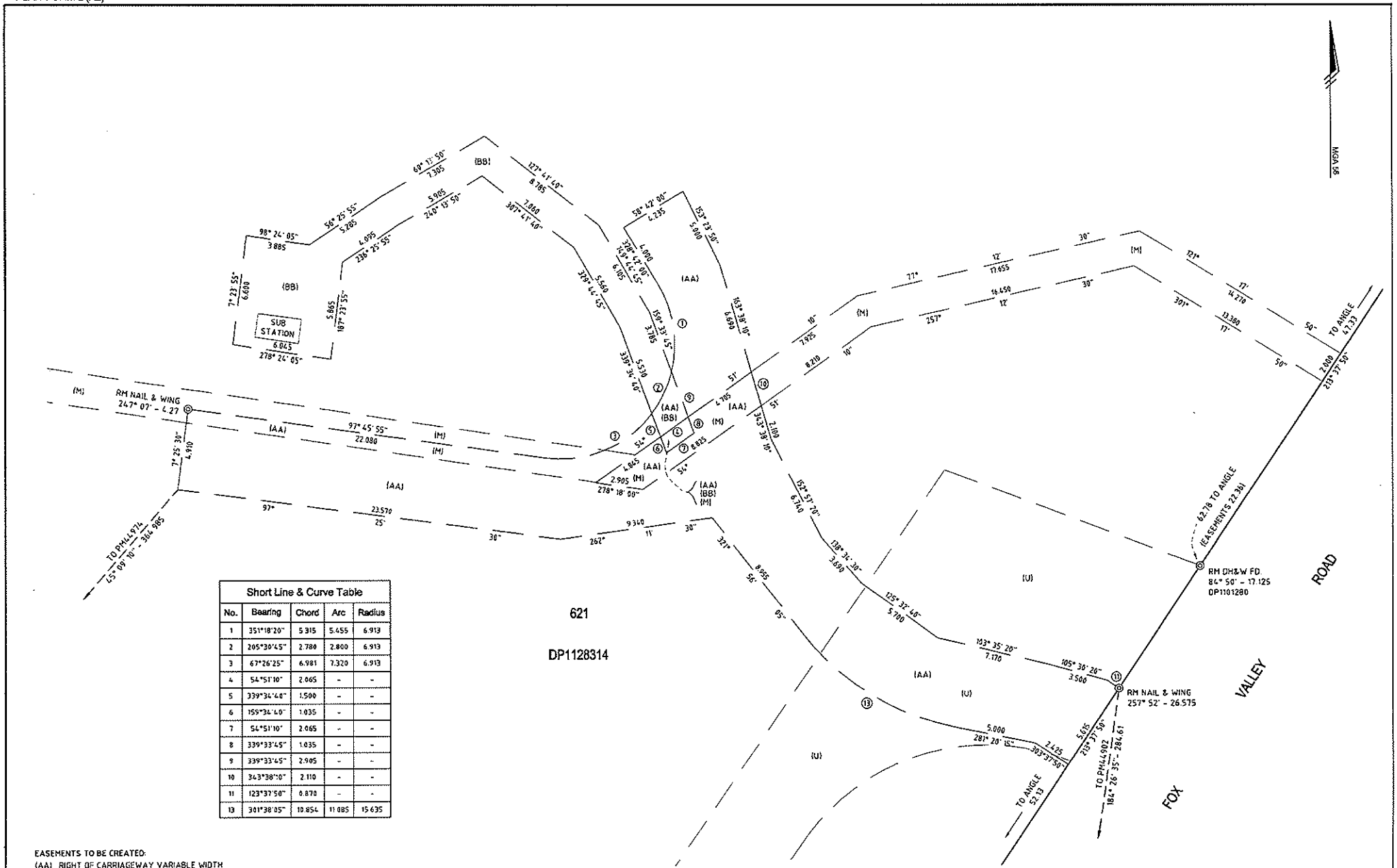


DIAGRAM 1
1:150

Short Line & Curve Table				
No.	Bearing	Chord	Arc	Radius
1	351°18'20"	5.915	5.455	6.913
2	205°30'45"	2.780	2.800	6.913
3	67°26'25"	6.981	7.320	6.913
4	54°51'10"	2.065	-	-
5	339°34'40"	1.500	-	-
6	159°34'40"	1.035	-	-
7	54°51'10"	2.065	-	-
8	339°33'45"	1.035	-	-
9	339°33'45"	2.905	-	-
10	343°38'10"	2.110	-	-
11	123°37'50"	0.878	-	-
13	301°38'05"	10.854	11.085	15.635

EASEMENTS TO BE CREATED:
(AA) RIGHT OF CARRIAGEWAY VARIABLE WIDTH
(BB) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES VARIABLE WIDTH

EXISTING EASEMENTS:
(M) EASEMENT FOR ELECTRICITY PURPOSES (3301465)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

Surveyor : Brian Franklin Date of Survey : 28 July 011 Surveyor's Ref : F691SW_S01c	PLAN FOR EASEMENT PURPOSES WITHIN LOT 621 DP 1128314	LGA : KU-RING-GAI, HORNSBY Locality : WAHROONGA Subdivision No : ——— Lengths are in metres. Reduction Ratio 1 : 150	Registered 1.5.2012	DP1170796

WARNING : Creasing or folding will lead to rejection

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 Sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PERSUANT TO SEC. 88B OF THE CONVEYANCING ACT 1919

IT IS INTENDED TO CREATE -

1. EASEMENT FOR ELECTRICITY AND OTHER PURPOSES VARIABLE WIDTH
2. RIGHT OF CARRIAGEWAY VARIABLE WIDTH

If space is insufficient use PLAN FORM 6A annexure sheet

Crown Lands NSW / Western Lands Office Approval

I, ... in approving this plan certify (Authorised Officer) that all necessary approvals in regard to the allocation of the land shown herein has been given.

Signature: .....
Date: .....
File Number: .....
Office: .....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to :

the proposed ..... set out herein (insert 'subdivision' or 'new road')

.....
* Authorised Person/*General Manager/*Accredited Certifier

Consent Authority: .....
Date of Endorsement: .....
Accreditation no: .....
Subdivision Certificate no: .....
File no: .....

* Strike through inapplicable parts.

DP1170796

* OFFICE USE ONLY

Registered 1.5.2012
Title System : TORRENS
Purpose : EASEMENT

PLAN FOR

EASEMENT PURPOSES WITHIN LOT 621 DP1128314

LGA : KU-RING-GAI & HORNSBY
Locality : WAHROONGA
Parish : GORDON
County : CUMBERLAND

Survey Certificate

I, BRIAN JOHN FRANKLIN
of WALLIS & MOORE INSITES 55 EAST PARADE, SUTHERLAND 2232
a surveyor registered under the *Surveying & Spatial Information Act 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying & Spatial Information Regulation, 2006* and was completed on: 28 JULY 2011

The survey relates to EASEMENT PURPOSES WITHIN LOT 621 DP1128314

(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature B Franklin *Dated :* 28-07-2011
Surveyor registered under the Surveying & Spatial Information Act 2002

Datum Line: 'X'-'Y'
Type: Urban / ~~Rural~~

Plans used in the preparation of survey / compilation

DP206859	DP834966
DP834960	DP834967
DP834961	DP834968
DP834962	DP834969
DP834963	DP880017
DP834964	DP1017514
DP834965	DP1128314

If space is insufficient use PLAN FORM 6A annexure sheet

SURVEYOR'S REFERENCE : F691SW__S01c

DEPOSITED PLAN ADMINISTRATION SHEET

PLAN FOR

EASEMENT PURPOSES WITHIN LOT 621 DP1128314

DP1170796

Registered: 1.5.2012

• OFFICE USE ONLY

Subdivision Certificate No: ———

Date of Endorsement: ———

The Common Seal of
AUSTRALIASIAN CONFERENCE ASSOCIATION LIMITED was hereunto affixed pursuant to a resolution of the Board of management in the presence of:

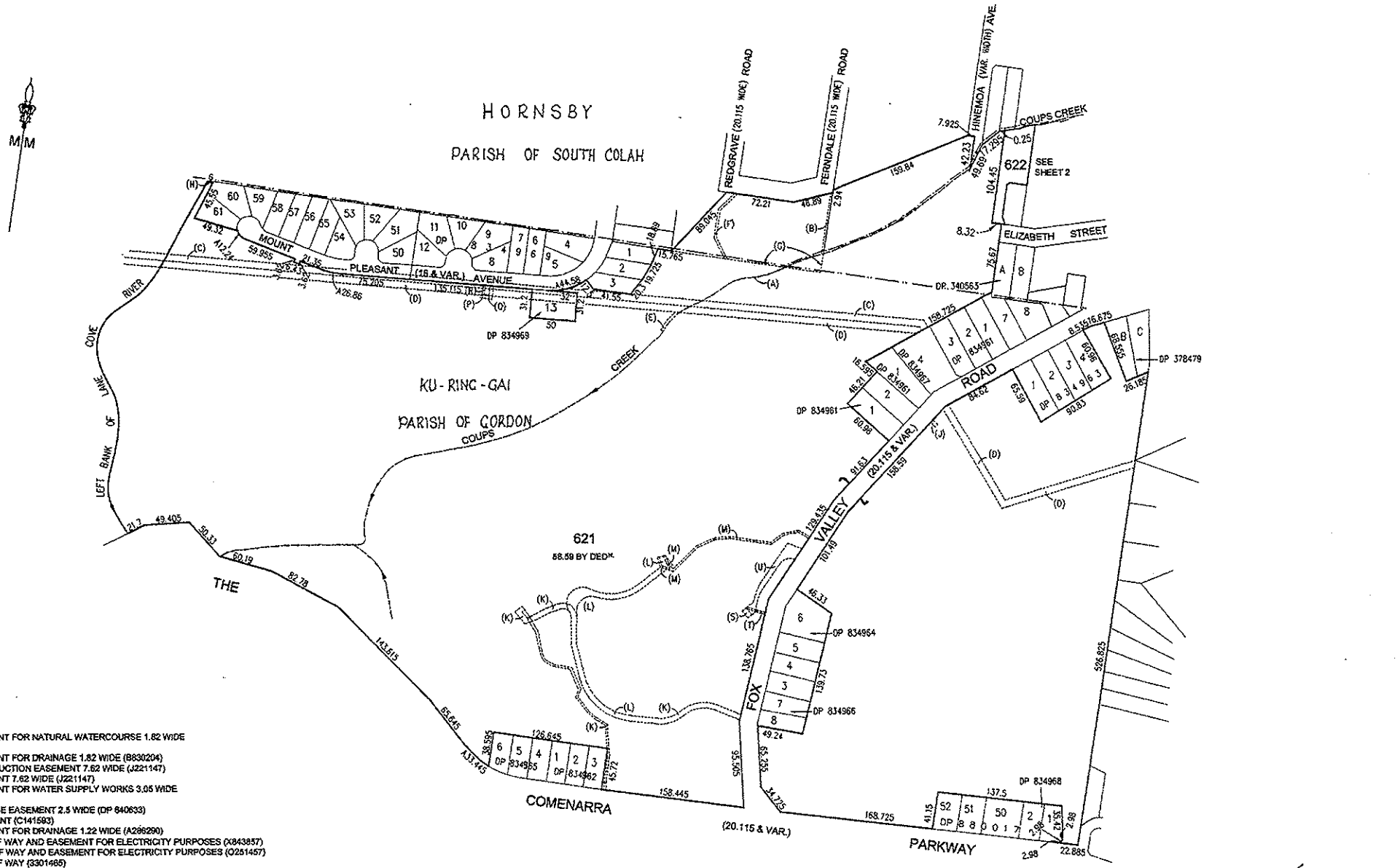
.....
.....
.....

Members of the Board of Management

.....

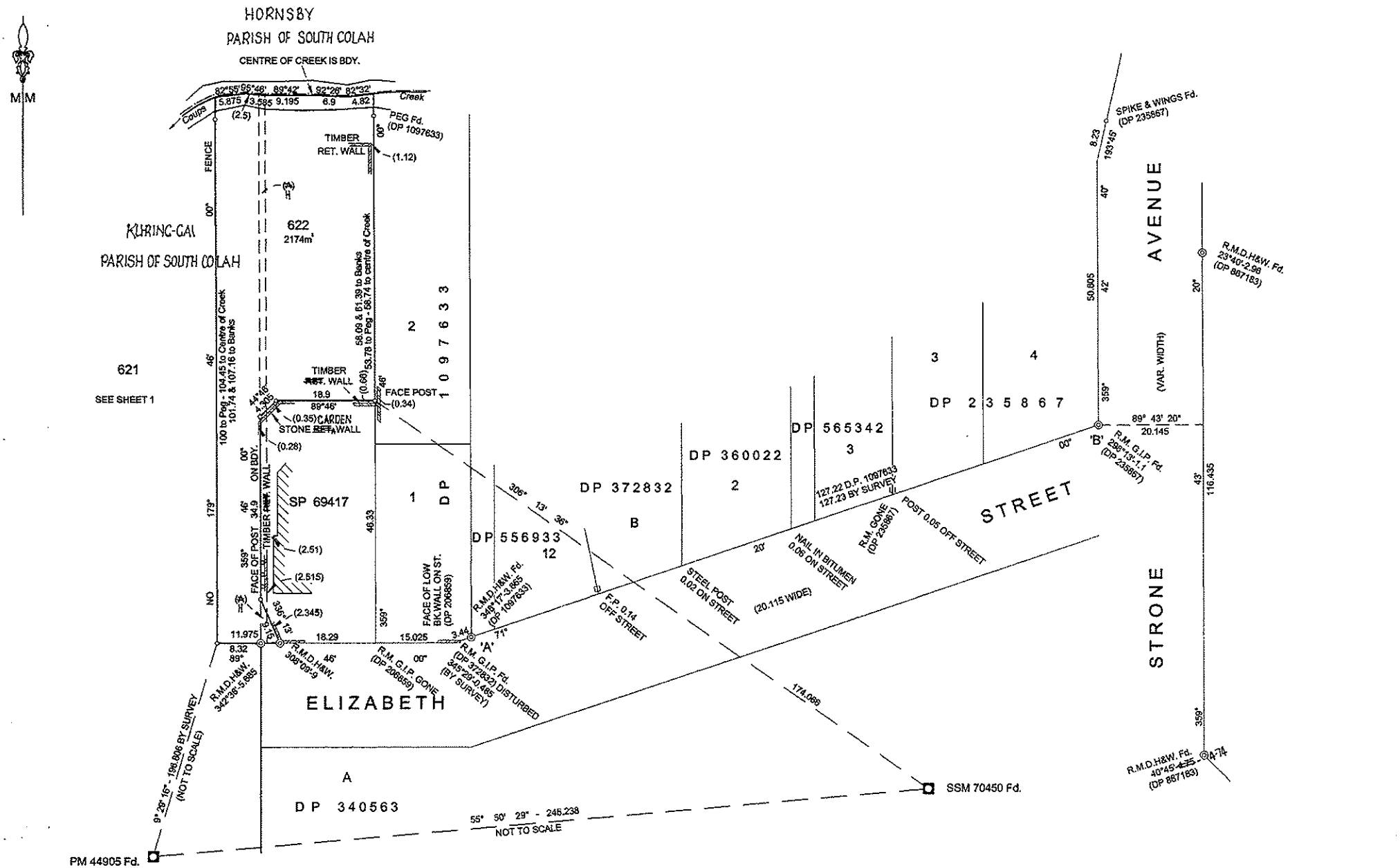
Secretary

SURVEYOR'S REFERENCE : F691SW_S01c



(A) EASEMENT FOR NATURAL WATERCOURSE 1.82 WIDE (B830204)
(B) EASEMENT FOR DRAINAGE 1.82 WIDE (B830204)
(C) CONSTRUCTION EASEMENT 7.62 WIDE (J221147)
(D) EASEMENT 7.62 WIDE (J221147)
(E) EASEMENT FOR WATER SUPPLY WORKS 3.05 WIDE (K610315)
(F) DRAINAGE EASEMENT 2.5 WIDE (DP 840633)
(G) COVENANT (C141593)
(H) EASEMENT FOR DRAINAGE 1.22 WIDE (A286290)
(J) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (X843857)
(K) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (O251457)
(L) RIGHT OF WAY (3301465)
(M) EASEMENT FOR ELECTRICITY PURPOSES (3301465)
(N) EASEMENT TO DRAIN WATER 1 WIDE (D.P.1017514)
(P) EASEMENT FOR ELECTRICITY SUBSTATION (AB624793)
(Q) RIGHT OF WAY (AB624793)
(R) EASEMENT FOR ELECTRICITY PURPOSES (AB624793)
(S) EASEMENT FOR ELECTRICITY SUBSTATION 5.33 WIDE (AC484401)
(T) EASEMENT FOR ELECTRICITY PURPOSES 2 WIDE (AC484401)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

Surveyor: STELLA L. WALTER Date of Survey: 2nd October 2007 Surveyor's Ref: 4221 2007M7100(1214) Partial Survey	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007/59 Lengths are in metres. Reduction Ratio 1:3000	Registered 31.7.2008	DP1128314 P



(A) - EASEMENT FOR DRAINAGE 1.22 WIDE (A286290)
H

Surveyor: STELLA L.WALTER Date of Survey: 2nd October 2007 Surveyor's Ref: 4221	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007/59 Lengths are in metres. Reduction Ratio 1:500	Registered 31.7.2008	DP1128314

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

3/11/07

3/11/07

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED
Common Seal
A.C.N.
000 003 930

The Common Seal of AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED was hereunto affixed pursuant to a resolution of the Board of management in the presence of:

Members of the Board of Management

Secretary

Use PLAN FORM 6A
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

I.....in approving this plan certify
(Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given

Signature:.....
Date:.....
File Number:.....
Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed.....SUBDIVISION..... set out herein
(insert 'subdivision' or 'new road')

.....
* Authorised Person/~~General Manager/Accredited Certifier~~

Consent Authority: .....KU-RING-GAI.....
Date of Endorsement: .....7-11-07.....
Accreditation no: .....
Subdivision Certificate no: .....2007/59.....
File no: .....

* Delete whichever is inapplicable.

DP1128314 S

Registered: 31.7.2008

Title System: Torrens

Purpose: Subdivision

PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859

LGA: KU-RING-GAI, HORNSBY

Locality: WAHROONGA

Parish: GORDON, SOUTH COLAH

County: CUMBERLAND

Surveying Regulation, 2006

I, Stella Louise Walter
of Mepstead & Associates P.O.Box 208 Pennant Hills NSW
a surveyor registered under the *Surveying Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying Regulation, 2006* and was completed on: 5th October 2007
The survey relates to Lot 622 only. Lot 621 is compiled
.....
.....
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature .....Stella Walter..... *Dated:* 12.10.07
Surveyor registered under the Surveying Act, 2002

Datum Line: A-B *D.P.1097633*.....
Type: Urban

Plans used in the preparation of survey/compilation

D.P.7348	D.P.1017514
D.P.206859	D.P.1097633
D.P.235867	S.P.69417
D.P.311336	
D.P.360022	
D.P.372832	
D.P.867183	

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE:4221 2007M7(1214) Partial Survey

* OFFICE USE ONLY

PLAN OF

DP1128314

Registered: 31.7.2008

Subdivision Certificate No:

Date of Endorsement:

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of Witness:

Name of Witness: BRANDON LEIGH QUIN
Address of Witness: Level 23, 66 Eagle Street
BRISBANE QLD 4000

Certified correct for the purposes of the Real Property Act 1900 by the Mortgagee.

Signature of Attorney:

Attorney's Name: DAVID GEORGE ROBERTS
Partner of Cooper Grace Ward Lawyers
Signed for and on behalf of FirstMac Finance Pty Ltd
ACN 123 871 698
Power of Attorney - Book 4512
- No. 136

SURVEYOR'S REFERENCE:

* OFFICE USE ONLY

TH

20 MAR 2009

ADVANCE LEGAL SEARCH PTY LIMITED

(ACN 077 067 068)
ABN 49 077 067 068

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9754 1590
Mobile: 0412 169 809
Facsimile: +612 9754 1364
Email: alsearch@optusnet.com.au

18 March 2009

ENVIRONMENTAL INVESTIGATION SERVICES
PO Box 976
NORTH RYDE BC NSW 1670

Attention: Todd Hore

RE: **Sydney Adventist Hospital**
Fox Valley Road,
Wahroonga

Current Search

Folio Identifier 621/1128314 (title attached)
DP 1128314 (plan attached)
Dated 16 March 2009
Registered Proprietor:
AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

Title Tree
Lot 621 DP 1128314

Folio Identifier 621/1128314

Folio Identifier 62/1017514

Folio Identifier 53/880017

Folio Identifier 14/834969

Certificate of Title Volume 8447 Fol 83

Certificate of Title Volume 6572 Fol 212

Certificate of Title Volume 5964 Fol 61

See Notes (a), (b), (c) & (d)

(a)		**(b)**	**(c)**
CTVol 4506 Folio 44		CTVol 5011 Folio 245	CTVol 3067 Folio 88
CTVol 2827 Folio 182		CTVol 313 Folio 146	CTVol 2112 Folio 104
(ai)	**(aii)**	***	***
CT 97 – 141	CT 98 - 64		
****	****		

(d)

Certificate of Title Volume 4785 Folio 192

****

Summary of proprietor(s)
Lot 621 DP 1128314

Year	Proprietor
	(Lot 621 DP 1128314)
2008 – todate	Australasian Conference Association Limited
(2008 – todate)	*(various commercial leases see Folio Identifier 621/1128314)*
(2008 – todate)	*(various commercial leases see Historical Folio Identifier 621/1128314)*
	(Lot 62 DP 1017514)
2000 – 2008	Australasian Conference Association Limited
(2000 – 2008)	*(various commercial leases see Folio Identifier 62/1017514)*
(2000 – 2008)	*(various commercial leases see Historical Folio Identifier 62/1017514)*
	(Lot 53 DP 880017)
1998 – 2000	Australasian Conference Association Limited
(1998 – 2000)	*(various commercial leases see Historical Folio Identifier 53/880017)*
	(Lot 14 DP 834969)
1994 – 1998	Australasian Conference Association Limited
(1994 – 1998)	*(various commercial leases see Historical Folio Identifier 14/834969)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 158 Acres 0 Roods 25 Perches – CTVol 8447 Fol 83)
1963 – 1994	Australasian Conference Association Limited
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ¼ Perches – CTVol 6572 Fol 212)
1952 – 1963	Australasian Conference Association Limited
(1955 – 1958)	*(lease to Walter George Fredericks, storekeeper & Margaret Lucy Fredericks, of part)*
	(Portion 30 and part Portions 28, 29 & 31 and 1 Acre 2 Roods 4 ½ Perches grant, Parish Gordon & South Colah – Area 159 Acres 1 Roods 37 ½ Perches – CTVol 5964 Fol 61)
1949 – 1952	Australasian Conference Association Limited

See Notes (a), (b), (c) & (d)

Note (a)

	(Part Portions 29 & 30 Parish Gordon – Area 74 Acres 0 Roods 3 ¾ Perches – CTVol 4506 Fol 44)
1931 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 75 Acres 1 Roods 18 Perches – CTVol 2827 Fol 182)
1918 – 1931	Australasian Conference Association Limited

See Notes (ai) & (aii)

Note (ai)

	(Part Portion 30 Parish Gordon – Area 9 Acres 0 Roods 33 Perches – CTVol 97 Fol 141)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1890 – 1901	Joshua Reubon Johnson, minor

****

Note (aii)

	(Part Portions 29 & 30 Parish Gordon – Area 71 Acres 2 Roods 21 Perches – CTVol 98 Fol 64)
1903 – 1918	The Sydney Sanitarium and Benevolent Association Limited
1901 – 1903	Frederick Lacey Sharp, business manager John Allen Burbery, business manager Daniel Kness, physician Eugene William Farnsworth, minister of gospel Merritt Gardiner Kellogg, architect
1895 – 1901	Elizabeth Sharpe Evans, widow
1870 – 1895	Richard Battleff Evans, labourer

****

Note (b)

	(Part Portion 31 Parish Gordon – Area 54 Acres 2 Roods 31 ½ Perches – CTVol 5011 Fol 245)
1941 – 1949	Australasian Conference Association Limited
1939 – 1941	Perpetual Trustee Company (Limited)
	(Portion 31 Parish Gordon – Area 72 Acres – CTVol 313 Fol 146)
1935 – 1939	Perpetual Trustee Company (Limited)
1885 – 1935	Austin Torange, esquire
1877 – 1885	Alexander Bowman, grantee

****

Note (c)

	(Part Portions 29 & 30 Parish Gordon – Area 16 Acres 3 Roods 18 Perches – CTVol 3067 Fol 88)
1920 – 1949	Australasian Conference Association Limited
	(Part Portions 29 & 30 Parish Gordon – Area 17 Acres 0 Roods 10 ½ Perches – CTVol 2112 Fol 104)
1910 – 1920	Alexander Gordon Waugh, orchardist

****

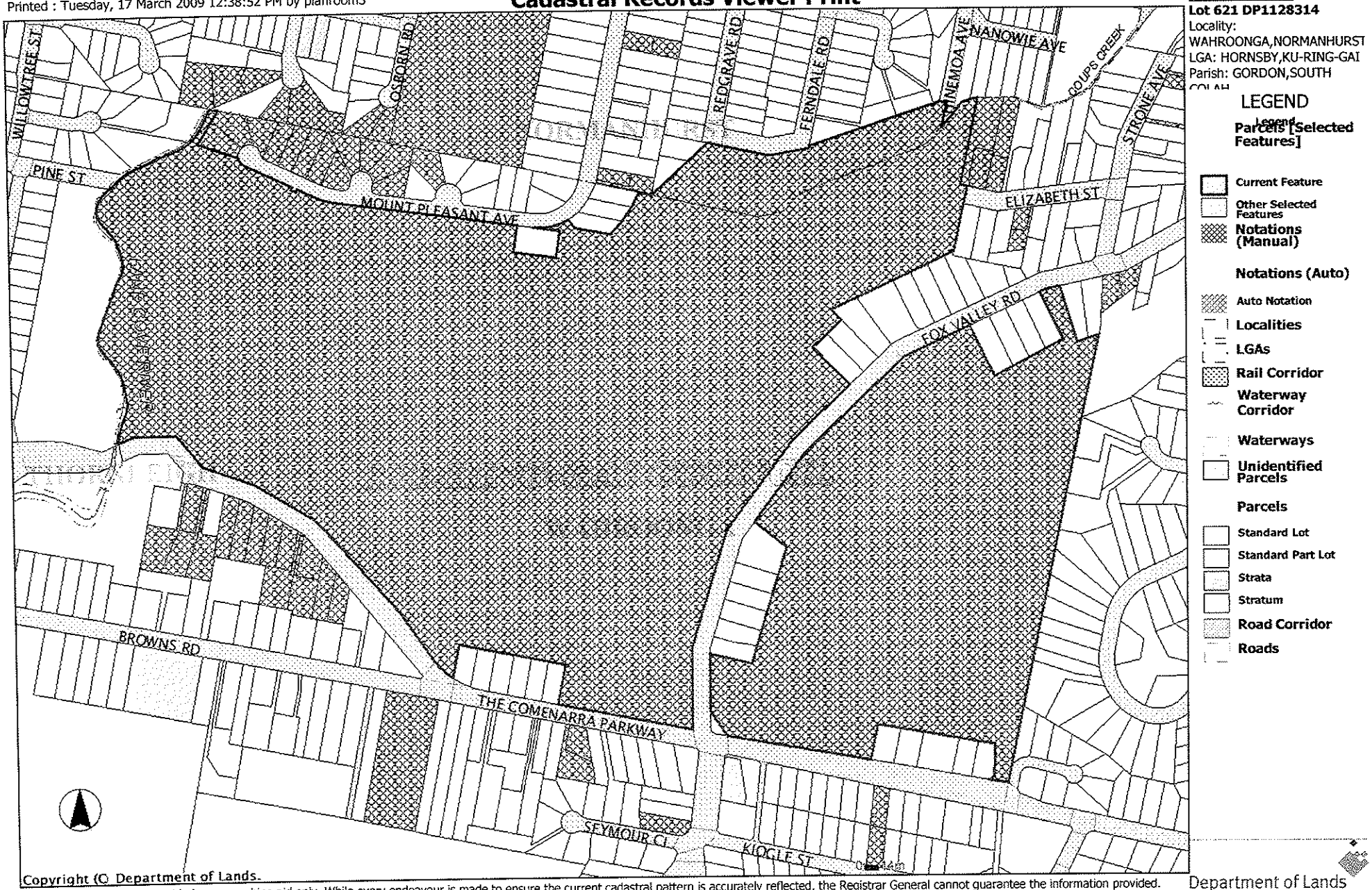
Note (d)

	(1 Acre 2 Rood 4 ½ Perches, Grant of Closed – CTVol 4785 Fol 192)
1936 – 1949	Australasian Conference Association Limited

****

Printed : Tuesday, 17 March 2009 12:38:52 PM by planroom3

Cadastral Records Viewer Print



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This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided.

Department of Lands

Advance Legal Searchers Pty Ltd hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act.

Information provided through Tri-Search an approved LPI NSW Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314

SEARCH DATE	TIME	EDITION NO	DATE
12/7/2012	6:59 PM	11	10/7/2012

LAND

LOT 621 IN DEPOSITED PLAN 1128314
AT WAHROONGA
LOCAL GOVERNMENT AREA HORNSBY, KU-RING-GAI
PARISH OF GORDON COUNTY OF CUMBERLAND
PARISH OF SOUTH COLAH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1128314

FIRST SCHEDULE

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED

SECOND SCHEDULE (55 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 C141593 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
3 B830204 EASEMENT FOR NATURAL WATERCOURSE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 B830204 EASEMENT FOR DRAINAGE 1.82 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 J221147 EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 J221147 CONSTRUCTION EASEMENT 7.62 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 K610315 EASEMENT FOR WATER SUPPLY WORKS 3.05 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
8 DP640633 DRAINAGE EASEMENT 2.5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 X843857 LEASE TO SYDNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO 6435 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH X843857. EXPIRES 31.12.2037
10 O251457 LEASE TO SYDNEY ELECTRICITY OF SUBSTATION PREMISES NO.7241 TOGETHER WITH RIGHT OF WAY & EASEMENT FOR ELECTRICITY PURPOSES AS SHOWN IN PLAN WITH O251457. EXPIRES 28.2.2045
11 3301465 LEASE TO ENERGY AUSTRALIA OF SUBSTATION PREMISES NO.7484 TOGETHER WITH RIGHT OF WAY & EASEMENT SHOWN IN PLAN WITH 3301465. EXPIRES 31.8.2046

END OF PAGE 1 - CONTINUED OVER

ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 2

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

12 5431961 LEASE TO OPTUS MOBILE PTY LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH 5431961. COMMENCES 31/3/2009. EXPIRES: 30/3/2014.

13 DP1017514 EASEMENT TO DRAIN WATER 1 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

14 AA95145 LEASE TO DR ARTHUR RICHARDSON PTY LTD OF SUITE 503, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2008. OPTION OF RENEWAL: 5 YEARS.

15 AA177677 LEASE TO CUNDLE MANAGEMENT SERVICES PTY LIMITED OF SUITE 505, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 27/7/2008. OPTION OF RENEWAL: 5 YEARS.

16 AA478792 LEASE TO GREGORY BRUCE BENNETT (SEE AB940557) OF SUITE 604, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 3/8/2008. OPTION OF RENEWAL: 5 YEARS.

17 AB624793 EASEMENT FOR ELECTRICITY SUBSTATION AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

18 AB624793 RIGHT OF WAY AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

19 AB624793 EASEMENT FOR ELECTRICITY PURPOSES AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

20 AC352261 LEASE TO JDG WATSON PTY LTD OF SUITE 402 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

21 AC352262 LEASE TO HOAM PTY LTD OF SUITE 401 THE SAN CLINIC 185 FOX VALLEY ROAD WAHROONGA. EXPIRES: 31/12/2010. OPTION OF RENEWAL: 2 X 5 YEARS.

22 AC366463 LEASE TO SPECIALIST ONCOLOGY SERVICES PTY LTD OF SUITES 301 AND 302, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

23 AC366464 LEASE TO NORTHERN SURGICAL ONCOLOGY PTY LTD OF SUITE 404, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/10/2010. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF FIVE YEARS.

24 AC484401 EASEMENT FOR ELECTRICITY SUBSTATION PURPOSES 5.33 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

25 AC484401 EASEMENT FOR ELECTRICITY PURPOSES 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

26 AC484401 RIGHT OF WAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

27 AD900986 LEASE TO TELSTRA CORPORATION LIMITED OF THE PART SHOWN HATCHED IN PLAN WITH AD900986. EXPIRES:

END OF PAGE 2 - CONTINUED OVER

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 3

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

30/6/2012. OPTION OF RENEWAL: 5 YEARS.

28 AD990739 LEASE TO SIMON TAYLOR OF SUITE 303 OF "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 19/3/2011. OPTION OF RENEWAL: 5 YEARS WITH A FURTHER PERIOD OF 5 YEARS.

29 AE798309 LEASE TO R J MOBBS & ASSOCIATES PTY LTD OF THE POON CHILDCARE CENTRE, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 31/3/2013.

AE888133 MORTGAGE OF LEASE AE798309 TO BANK OF WESTERN AUSTRALIA LIMITED

30 AE798310 LEASE TO YEW TREE MANAGEMENT PTY LTD OF SUITE 304, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 26/8/2013.

31 AE798311 LEASE TO BRAMJO PTY LTD OF SUITE 307, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 30/6/2013. OPTION OF RENEWAL: 5 YEARS.

32 AE798312 LEASE TO MELISSA DOOHAN OF SUITE 504, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

33 AE798313 LEASE TO THOMAS DEAN PTY LIMITED OF SUITE 506, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2013.

34 AE798314 LEASE TO ELIOT JAY ROACH OF SUITE 511, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

35 AE798315 LEASE TO MADELEINE GIUTRONICH OF SUITE 601C, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

36 AE798316 LEASE TO BONE RECONSTRUCTION PTY LIMITED OF SUITE 601D, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

37 AE798317 LEASE TO DR R. & S. L. KIRSOP PTY LIMITED OF SUITE 605, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

38 AE798318 LEASE TO PACIFIC CARDIOLOGY SERVICES PTY LIMITED OF SUITE 502, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 9/7/2013.

39 AE798319 LEASE TO SCOTT BUTLER SIMPSON OF SUITE 510, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 29/7/2013.

40 AE893573 LEASE TO VODAFONE NETWORK PTY LIMITED OF THE PART OF THE ROOF SHOWN HATCHED IN PLAN WITH U990412 EXCLUDING THE PART SHOWN HATCHED IN PLAN WITH 5532722. EXPIRES: 30/3/2014.

41 AE968338 LEASE TO MAXIVEND PTY LTD OF SUITE 601A, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

END OF PAGE 3 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 621/1128314 PAGE 4

SECOND SCHEDULE (55 NOTIFICATIONS) (CONTINUED)

42 AE968339 LEASE TO WESTERN SYDNEY ORTHOPAEDIC ASSOCIATES PTY LIMITED OF SUITE 601B, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 27/7/2013.

43 AE968340 LEASE TO SPECIALIST CARDIOLOGY PTY LIMITED OF SUITE 603, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 3/8/2013.

44 AE968341 LEASE TO ROBERT JAMES HARDWICK OF SUITE 606, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 24/7/2013.

45 AE968342 LEASE TO NORTHSIDE PHYSIO NO.2 PTY LIMITED OF SUITE 602, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 19/10/2013.

46 AF33418 LEASE TO MATTHEW JOSEPH MCNAMARA BEING THE PREMISES KNOWN AS SUITE 501, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2013.

47 AF33419 LEASE TO STUART GRENVILLE KIRKHAM BEING PREMISES KNOWN AS SUITE 508, THE SANS CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 22/7/2013.

48 AF160098 LEASE TO GRAHAM DOUGLAS SELLARS OF SUITE 507, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 9/7/2013.

49 AF160099 LEASE TO GEOFFREY HOWARD PAUL OF SUITE 509, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 30/6/2013.

50 AF747934 LEASE TO MCHARG NOMINEES PTY LIMITED OF SUITE 306, THE SAN CLINIC, 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 15/7/2017. OPTION OF RENEWAL: 7 YEARS.

51 AG116120 LEASE TO NORTHERN HAEMATOLOGY & ONCOLOGY GROUP PTY LIMITED OF SUITE 403, THE SAN CLINIC, 185 FOX VALLEY RD, WAHROONGA. EXPIRES: 31/12/2015. OPTION OF RENEWAL: 5 YEARS.

52 AG178861 LEASE TO SYDNEY UROLOGICAL ASSOCIATES PTY LIMITED OF SUITE 406, "THE SAN CLINIC", 185 FOX VALLEY ROAD, WAHROONGA. EXPIRES: 30/10/2015. OPTION OF RENEWAL: 5 YEARS.

53 DP1170796 EASEMENT FOR ELECTRICITY & OTHER PURPOSES VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1170796

54 DP1170796 RIGHT OF CARRIAGEWAY VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1170796

55 AH101094 MORTGAGE TO NATIONAL AUSTRALIA BANK LIMITED

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

*ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

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LPI On-Line

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Information provided through Tri-Search an approved LPI*NSW* Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/7/2012 6:43PM

FOLIO: 621/1128314

First Title(s): VOL 313 FOL 146 OLD SYSTEM
Prior Title(s): 62/1017514

Recorded	Number	Type of Instrument	C.T. Issue
31/7/2008	DP1128314	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/8/2008	AE151089	TRANSFER OF LEASE	
28/7/2009	AE798308	REQUEST	
28/7/2009	AE798309	LEASE	
28/7/2009	AE798310	LEASE	
28/7/2009	AE798311	LEASE	
28/7/2009	AE798312	LEASE	
28/7/2009	AE798313	LEASE	
28/7/2009	AE798314	LEASE	
28/7/2009	AE798315	LEASE	
28/7/2009	AE798316	LEASE	
28/7/2009	AE798317	LEASE	
28/7/2009	AE798318	LEASE	
28/7/2009	AE798319	LEASE	EDITION 2
7/8/2009	AE888133	MORTGAGE OF LEASE	
1/9/2009	AE893573	LEASE	EDITION 3
10/9/2009	AE968338	LEASE	
10/9/2009	AE968339	LEASE	
10/9/2009	AE968340	LEASE	
10/9/2009	AE968341	LEASE	
10/9/2009	AE968342	LEASE	EDITION 4
9/11/2009	AF48048	TRANSFER OF LEASE	
24/11/2009	AF33418	LEASE	
24/11/2009	AF33419	LEASE	EDITION 5
1/12/2009	AF160098	LEASE	
1/12/2009	AF160099	LEASE	EDITION 6
9/9/2010	AF747934	LEASE	EDITION 7
5/1/2011	AF972684	CAVEAT	

END OF PAGE 1 - CONTINUED OVER

EIS - Wahroonga PRINTED ON 12/7/2012

Advance Legal Searchers Pty Ltd Phone: 02 9754 1590

LPI On-Line

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/7/2012 6:43PM

FOLIO: 621/1128314 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
5/4/2011	AG116120	LEASE	EDITION 8
14/4/2011	AG178861	LEASE	EDITION 9
1/5/2012	DP1170796	DEPOSITED PLAN	EDITION 10
14/6/2012	AH45841	WITHDRAWAL OF CAVEAT	
10/7/2012	AH101094	MORTGAGE	EDITION 11

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/7/2012 6:30PM

FOLIO: 621/1128314

First Title(s): VOL 313 FOL 146 OLD SYSTEM
Prior Title(s): 62/1017514

Recorded	Number	Type of Instrument	C.T. Issue
31/7/2008	DP1128314	DEPOSITED PLAN	FOLIO CREATED EDITION 1
15/8/2008	AE151089	TRANSFER OF LEASE	
28/7/2009	AE798308	REQUEST	
28/7/2009	AE798309	LEASE	
28/7/2009	AE798310	LEASE	
28/7/2009	AE798311	LEASE	
28/7/2009	AE798312	LEASE	
28/7/2009	AE798313	LEASE	
28/7/2009	AE798314	LEASE	
28/7/2009	AE798315	LEASE	
28/7/2009	AE798316	LEASE	
28/7/2009	AE798317	LEASE	
28/7/2009	AE798318	LEASE	
28/7/2009	AE798319	LEASE	EDITION 2
7/8/2009	AE888133	MORTGAGE OF LEASE	
1/9/2009	AE893573	LEASE	EDITION 3
10/9/2009	AE968338	LEASE	
10/9/2009	AE968339	LEASE	
10/9/2009	AE968340	LEASE	
10/9/2009	AE968341	LEASE	
10/9/2009	AE968342	LEASE	EDITION 4
9/11/2009	AF48048	TRANSFER OF LEASE	
24/11/2009	AF33418	LEASE	
24/11/2009	AF33419	LEASE	EDITION 5
1/12/2009	AF160098	LEASE	
1/12/2009	AF160099	LEASE	EDITION 6
9/9/2010	AF747934	LEASE	EDITION 7
5/1/2011	AF972684	CAVEAT	

END OF PAGE 1 - CONTINUED OVER

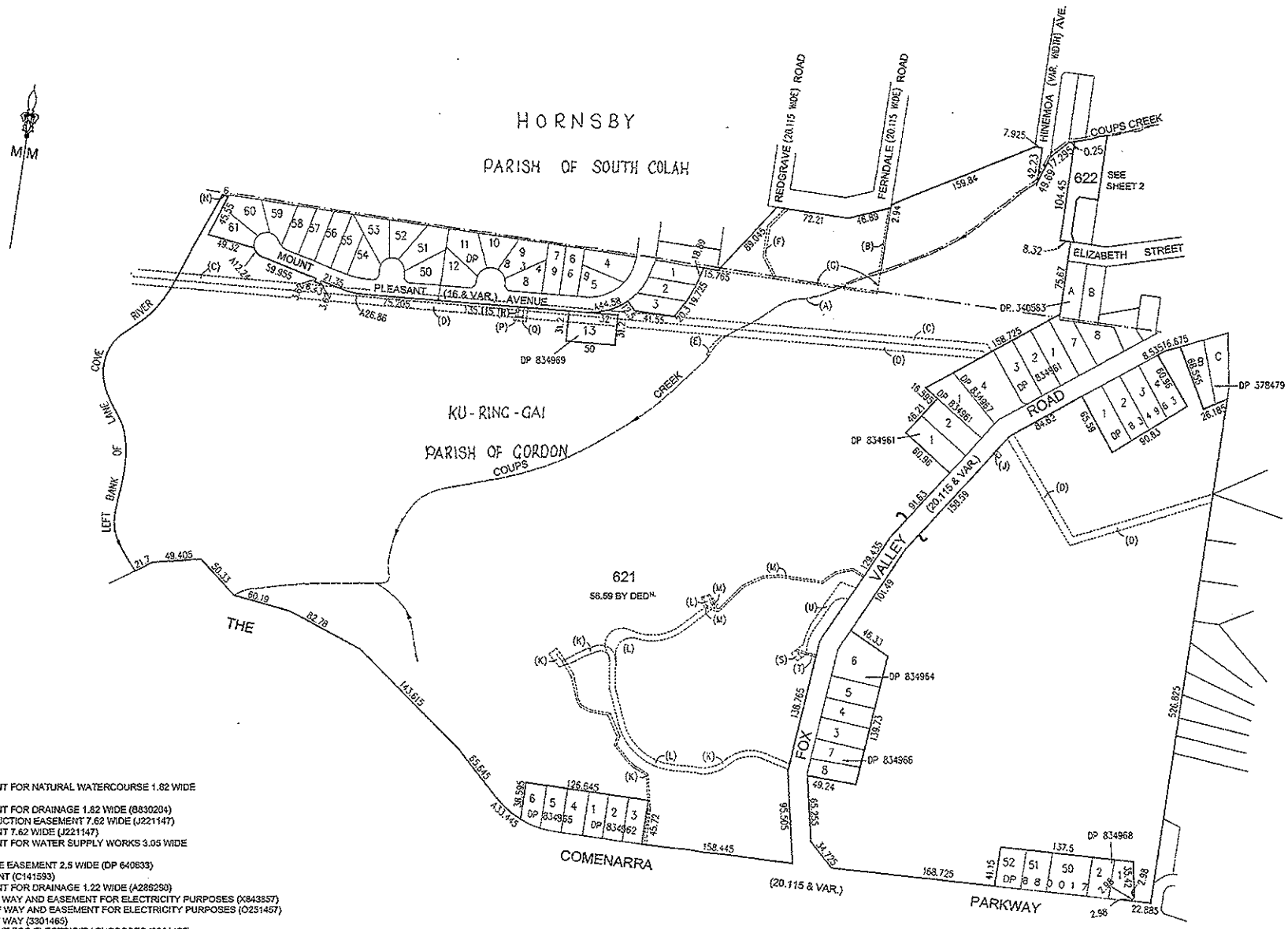
LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
16/7/2012 6:30PM

FOLIO: 621/1128314

Recorded	Number	Type of Instrument	C.T. Issue
5/4/2011	AG116120	LEASE	EDITION 8
14/4/2011	AG178861	LEASE	EDITION 9
1/5/2012	DP1170796	DEPOSITED PLAN	EDITION 10
14/6/2012	AH45841	WITHDRAWAL OF CAVEAT	
10/7/2012	AH101094	MORTGAGE	EDITION 11

*** END OF SEARCH ***

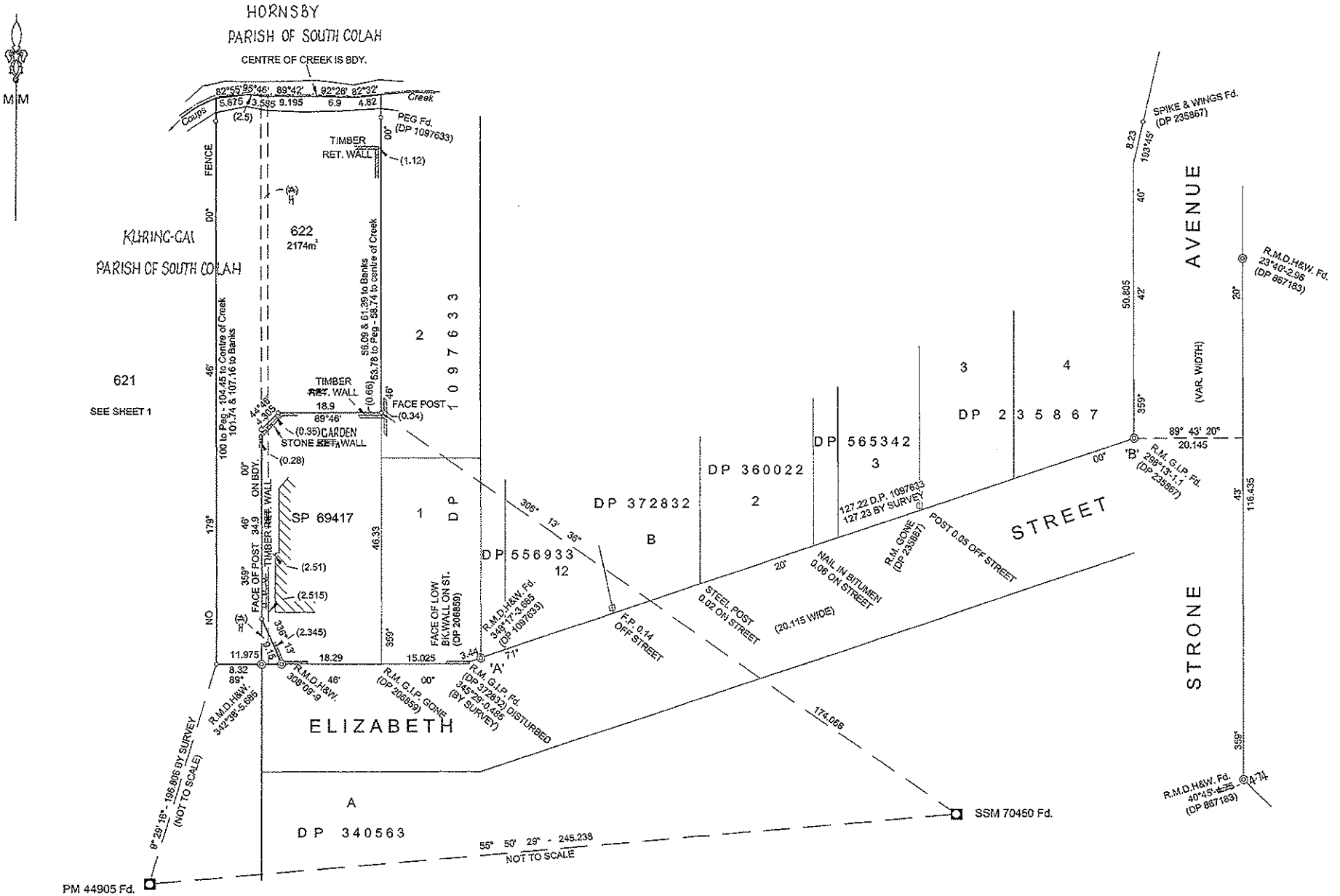


(A) EASEMENT FOR NATURAL WATERCOURSE 1.82 WIDE (B830204)
(B) EASEMENT FOR DRAINAGE 1.82 WIDE (B830204)
(C) CONSTRUCTION EASEMENT 7.62 WIDE (J221147)
(D) EASEMENT 7.62 WIDE (J221147)
(E) EASEMENT FOR WATER SUPPLY WORKS 3.05 WIDE (K610315)
(F) DRAINAGE EASEMENT 2.5 WIDE (DP 640633)
(G) COVENANT (C141593)
(H) EASEMENT FOR DRAINAGE 1.22 WIDE (A286290)
(J) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (X843857)
(K) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (O251457)
(L) RIGHT OF WAY (3301465)
(M) EASEMENT FOR ELECTRICITY PURPOSES (3301465)
(N) EASEMENT TO DRAIN WATER 1 WIDE (D.P.1017514)
(P) EASEMENT FOR ELECTRICITY SUBSTATION (AB624793)
(Q) RIGHT OF WAY (AB624793)
(R) EASEMENT FOR ELECTRICITY PURPOSES (AB624793)
(S) EASEMENT FOR ELECTRICITY SUBSTATION 5.33 WIDE (AC484401)
(T) EASEMENT FOR ELECTRICITY PURPOSES 2 WIDE (AC484401)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

Surveyor: STELLA L. WALTER Date of Survey: 2nd October 2007 Surveyor's Ref: 4221 2007M7100(1214) Partial Survey	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007/59 Lengths are in metres. Reduction Ratio 1:3000	Registered 31.7.2008

DP1128314 P

Req:R589598 /Doc:DP 1128314 P /Rev:01-Aug-2008 /Sts:SC.OK /Prt:16-Mar-2009 19:55 /Pgs:ALL /Seq:1 of 4
Ref:ALSP /Src:M



Surveyor: STELLA L.WALTER Date of Survey: 2nd October 2007 Surveyor's Ref: 4221	PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859	LGA: KU-RING-GAI, HORNSBY Locality: WAHROONGA Subdivision No: 2007 /59 Lengths are in metres. Reduction Ratio 1:500	Registered 31.7.2008	DP1128314

Ref:ALSP /Sro:M

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

3/11/07

3/11/07

AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED
Common Seal
A.C.N.
000 003 930

The Common Seal of AUSTRALASIAN CONFERENCE ASSOCIATION LIMITED was hereunto affixed pursuant to a resolution of the Board of management in the presence of:

Members of the Board of Management

Secretary

Use PLAN FORM 6A
for additional certificates, signatures, seals and statements

Crown Lands NSW/Western Lands Office Approval

I.....in approving this plan certify
(Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given

Signature:.....
Date:.....
File Number:.....
Office:.....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed.....SUBDIVISION..... set out herein
(insert 'subdivision' or 'new road')

.....
* Authorised Person/~~General Manager/Accredited Certifier~~

Consent Authority: KU-RING-GAI
Date of Endorsement: 7-11-07
Accreditation no: .....
Subdivision Certificate no: 2007/59
File no: .....

* Delete whichever is inapplicable.

DP1128314 S

Registered: 31.7.2008

Title System: Torrens

Purpose: Subdivision

PLAN OF SUBDIVISION OF LOT 62 IN D.P.1017514 AND LOT 1 IN D.P.206859

LGA: KU-RING-GAI, HORNSBY

Locality: WAHROONGA

Parish: GORDON, SOUTH COLAH

County: CUMBERLAND

Surveying Regulation, 2006

I, Stella Louise Walter
of Mepstead & Associates P.O.Box 208 Pennant Hills NSW
a surveyor registered under the *Surveying Act, 2002*, certify that the survey represented in this plan is accurate, has been made in accordance with the *Surveying Regulation, 2006* and was completed on: 5th October 2007
The survey relates to Lot 622 only. Lot 621 is compiled
.....
.....
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature .....Stella Walter..... *Dated:* 12.10.07
Surveyor registered under the Surveying Act, 2002

Datum Line: A-B *D.P.1097633*.....
Type: Urban

Plans used in the preparation of survey/compilation

D.P.7348	D.P.1017514
D.P.206859	D.P.1097633
D.P.235867	S.P.69417
D.P.311336	
D.P.360022	
D.P.372832	
D.P.867183	

(if insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE:4221 2007M7(1214) Partial Survey

* OFFICE USE ONLY

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheet(s)

PLAN OF

DP1128314

Registered: 31.7.2008

Subdivision Certificate No:

Date of Endorsement:

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of Witness:

Name of Witness: BRANDON LEIGH QUIN
Address of Witness: Level 23, 66 Eagle Street
BRISBANE QLD 4000

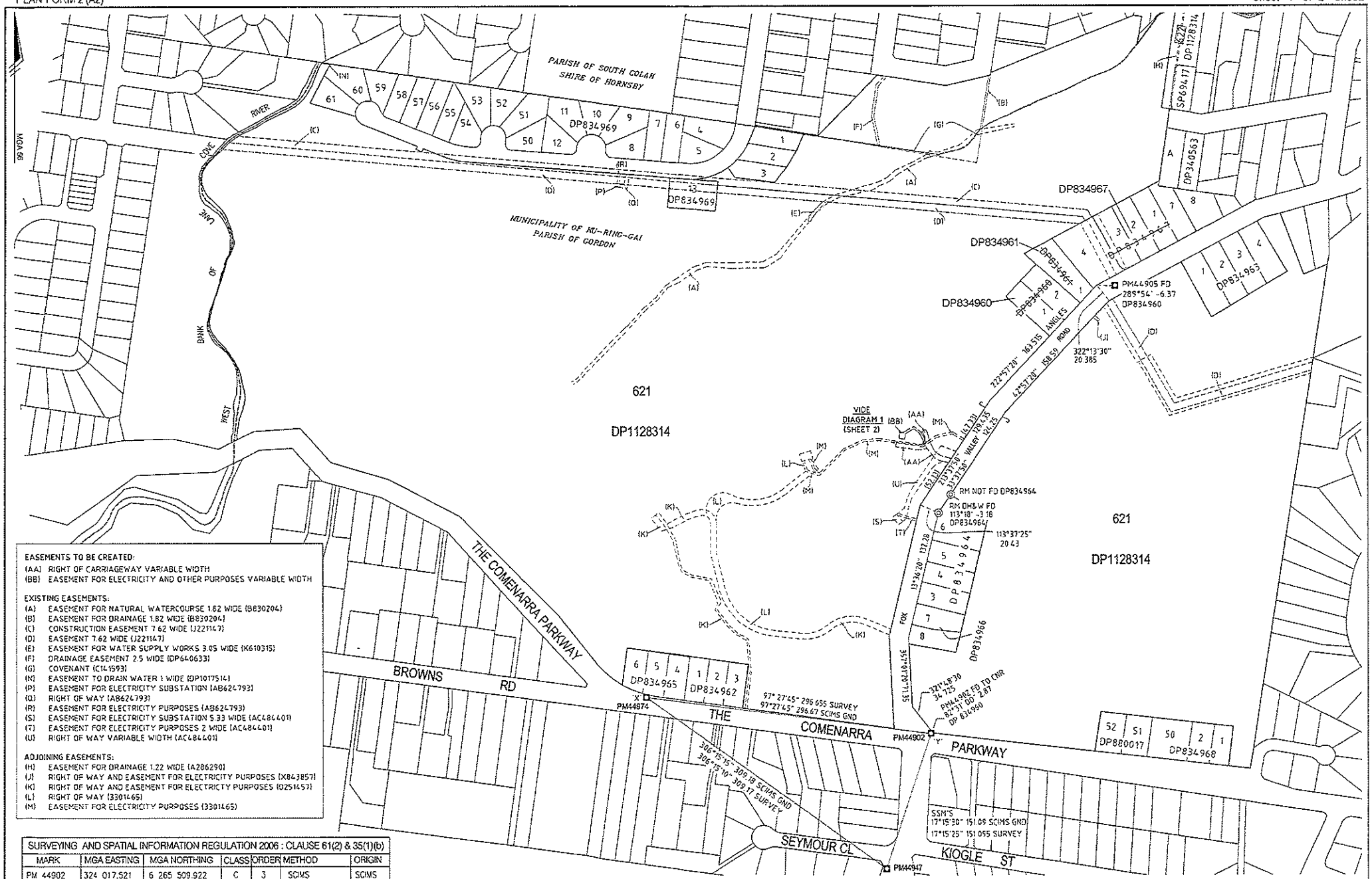
Certified correct for the purposes of the Real Property Act 1900 by the Mortgagee.

Signature of Attorney:

Attorney's Name: DAVID GEORGE ROBERTS
Partner of Cooper Grace Ward Lawyers
Signed for and on behalf of FirstMac Finance Pty Ltd
ACN 123 871 698
Power of Attorney - Book 4512
- No. 136

SURVEYOR'S REFERENCE:

* OFFICE USE ONLY



EASEMENTS TO BE CREATED:
(AA) RIGHT OF CARRIAGEWAY VARIABLE WIDTH
(BB) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES VARIABLE WIDTH

EXISTING EASEMENTS:
(A) EASEMENT FOR NATURAL WATERCOURSE 1.82 WIDE (B830204)
(B) EASEMENT FOR DRAINAGE 1.82 WIDE (B830204)
(C) CONSTRUCTION EASEMENT 7.62 WIDE (J221147)
(D) EASEMENT 7.62 WIDE (J221147)
(E) EASEMENT FOR WATER SUPPLY WORKS 3.05 WIDE (K610315)
(F) DRAINAGE EASEMENT 2.5 WIDE (DP640633)
(G) COVENANT (C141593)
(N) EASEMENT TO DRAIN WATER 1 WIDE (DP1077514)
(P) EASEMENT FOR ELECTRICITY SUBSTATION (AB624793)
(Q) RIGHT OF WAY (AB624793)
(R) EASEMENT FOR ELECTRICITY PURPOSES (AB624793)
(S) EASEMENT FOR ELECTRICITY SUBSTATION 5.33 WIDE (AC484401)
(T) EASEMENT FOR ELECTRICITY PURPOSES 2 WIDE (AC484401)
(U) RIGHT OF WAY VARIABLE WIDTH (AC484401)

ADJOINING EASEMENTS:
(H) EASEMENT FOR DRAINAGE 1.22 WIDE (A286290)
(J) RIGHT OF WAY AND EASEMENT FOR ELECTRICITY PURPOSES (X843857)
(K) RIGHT OF WAY AND EASEMENT FOR ELECTRICTY PURPOSES (D251457)
(L) RIGHT OF WAY (3301465)
(M) EASEMENT FOR ELECTRICITY PURPOSES (3301465)

SURVEYING AND SPATIAL INFORMATION REGULATION 2006 : CLAUSE 61(2) & 35(1)(b)

MARK	MGA EASTING	MGA NORTHING	CLASS	ORDER	METHOD	ORIGIN
PM 44902	324 017.521	6 265 509.922	C	3	SCIMS	SCIMS
PM 44947	323 972.697	6 265 365.634	B	2	SCIMS	SCIMS
PM 44974	323 723.379	6 265 548.452	B	2	SCIMS	SCIMS

COMBINED SCALE FACTOR = 0.999955 ZONE 56

SOURCE: M.G.A. CO-ORDINATES AND SCALE FACTOR ADOPTED FROM SCIMS ON THE 21st July 2011

Surveyor : Brian Franklin
Date of Survey : 28 July 2011
Surveyor's Ref : F691SW_S01c

PLAN FOR
EASEMENT PURPOSES WITHIN
LOT 621 DP 1128314

LGA : KU-RING-GAI, HORNSBY
Locality : WAHROONGA
Subdivision No : ——
Lengths are in metres Reduction Ratio 1 : 2500

Registered
1.5.2012

DP1170796

PLAN FORM 6A (Annexure Sheet) WARNING : Creasing or folding will lead to rejection ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 Sheet(s)

PLAN FOR

EASEMENT PURPOSES WITHIN LOT 621 DP1128314

DP1170796

Registered: 1.5.2012

* OFFICE USE ONLY

Subdivision Certificate No: ———

Date of Endorsement: ———

The Common Seal of
AUSTRALIASIAN CONFERENCE ASSOCIATION LIMITED was hereunto affixed pursuant to a resolution of the Board of management in the presence of:

.....
.....
.....

Members of the Board of Management

.....

Secretary

SURVEYOR'S REFERENCE : F691SW_S01c

APPENDIX C3

Site History Documents – Section 149 Certificates

PB.

19 JUL 2012

PLANNING CERTIFICATE

UNDER SECTION 149 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

818 Pacific Highway, Gordon NSW 2072
Locked Bag 1056, Pymble NSW 2073
T 02 9424 0000 F 02 9424 0001
DX 8703 Gordon TTY 02 9424 0875
E krnc@kmc.nsw.gov.au
W www.kmc.nsw.gov.au
ABN 86 408 856 411

Ku·ring·gai Council

PROPERTY DETAILS

Address: 185 Fox Valley Road WAHROONGA NSW 2076

Lot Description: Part Lot 621 DP 1128314

CERTIFICATE DETAILS

Certificate No: PC2068/12 **Certificate Date:** 17/07/2012

Certificate Type: Section 149(2) & (5)

Receipt No: 337455

APPLICANT'S DETAILS

REF: ACAL

Jeffery & Katauskas (Services) Pty Ltd
115-117 Wicks Rd
MACQUARIE PARK NSW 2113

BACKGROUND INFORMATION

This certificate provides information on how a property (such as land, a house, a commercial building, etc.) may be used and the limits on its development. The certificate contains information Council is aware of through its records and environmental plans with data supplied by the State Government. The details contained in this certificate are limited to that required by Section 149 of the Environmental Planning and Assessment Act.

1. WHICH ENVIRONMENTAL PLAN RESTRICTS THE USE OF THIS PROPERTY?

(Including planning proposals and draft local environmental plans exhibited prior to 1 July 2009 pursuant to section 66(1) b of the E. P. & A. Act).

State Environmental Planning Policy (Major Development) 2005 as amended.

Draft Local Environmental Plan No.191 – Preservation of Trees.
Draft Local Environmental Plan No.195.
Draft Local Environmental Plan No.192 and Draft Development Control Plan No.46 – Exempt and Complying Development.

Planning Proposal to amend the Ku-ring-gai Planning Scheme Ordinance to incorporate provisions for biodiversity, riparian land and heritage conservation areas.

---

2. WHAT IS THE ZONING OF THIS PROPERTY and the relevant environmental plan?

(Zoning is a way of classifying land and limits the range of uses or activities that may be permitted on that land or property).

Part zoned R1 General Residential, part zoned R2 Low Density Residential, part zoned R3 Medium Density Residential, part zoned R4 High Density Residential, part zoned B1 Neighbourhood Centre, part zoned E2 Environmental Conservation and part zoned SP1 Special Activities.

under the provisions of the State Environmental Planning Policy (Major Development) 2005 as amended.

---

3. WHAT DOES NOT REQUIRE DEVELOPMENT CONSENT under the above environmental plan(s)?

See Part 25 Wahroonga Estate Site of State Environmental Planning Policy (Major Development) 2005.

---

4. WHAT DOES REQUIRE DEVELOPMENT CONSENT under the above environmental plan(s)?

See Part 25 Wahroonga Estate Site of State Environmental Planning Policy (Major Development) 2005.

---

5. WHAT IS PROHIBITED by the above environmental plan(s)?

See Part 25 Wahroonga Estate Site of State Environmental Planning Policy (Major Development) 2005.

---

6. DO THE DIMENSIONS OF THE LAND PERMIT THE ERECTION OF A DWELLING HOUSE ON THIS PROPERTY?

See Part 25 Wahroonga Estate Site of State Environmental Planning Policy (Major Development) 2005.

---

7. WHAT OTHER PLANNING INSTRUMENTS AFFECT THIS PROPERTY?

(State and deemed state environmental plans are prepared by the State Government and cover issues as varied as rivers, residential development, employment, etc. If you have any further enquiries please contact the Department of Planning, Tel: 02 9228 6333 or email information@planning.nsw.gov.au..

Draft State Environmental Planning Policy (Competition)

State Environmental Planning Policy No.1 - Development Standards.
State Environmental Planning Policy No.4 - Development without Consent and Miscellaneous Exempt and Complying Development.
State Environmental Planning Policy No.6 - Number of storeys in a building.
State Environmental Planning Policy No.19 - Bushland in Urban Areas.
State Environmental Planning Policy No.21 - Caravan Parks
State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land).
State Environmental Planning Policy No.33 - Hazardous & Offensive Development.
State Environmental Planning Policy No.44 - Koala Habitat Protection.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.60 - Exempt and Complying Development.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Flat Development.
State Environmental Planning Policy No.70 - Affordable Housing(Revised Schemes).
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Temporary Structures) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

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8. WHICH DEVELOPMENT CONTROL PLANS APPLY TO THE PROPERTY?

(A development control plan adds further detail to local environmental plans and may address issues such as building height, car parking etc. Copies of the Plans are available from Council).

Development Control Plan No.8 - Professional Consulting Rooms
Development Control Plan No.28 - Advertising Signs
Development Control Plan No.31 - Access
Development Control Plan No.38 - Residential Design Manual
Development Control Plan No.40 - Construction and Demolition Waste Management
Development Control Plan No.43 - Car Parking for Development in Ku-ring-gai Council Area
Development Control Plan No.46 - Exempt and Complying Development
Development Control Plan No.47 - Water Management
Development Control Plan No.56 - Notification
Development Control Plan No.57 - Child Care Centres

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9. WHICH DEVELOPMENT CONTRIBUTION PLANS APPLY IF THIS PROPERTY IS DEVELOPED?

(A Development Contribution Plan – commonly known as a Section 94 Plan outlines the financial costs Council charges if a property is developed and Council believes the development will require additional services or facilities such as parks, roads etc. Copies of the Plans are available from Council).

Ku-ring-gai Contributions Plan 2010.

---

10. IS THE PROPERTY IDENTIFIED AS A HERITAGE ITEM by Council or State Government? (and if so, what is the status, e.g. local environmental plan, Heritage Act etc.)

Yes.

Part 25 of Schedule 3 of State Environmental Planning Policy (Major Development) 2005. Copy attached.

---

11. IS THE PROPERTY IN A CONSERVATION AREA?

No.

---

12. DOES THE PROPERTY INCLUDE OR COMPRISE CRITICAL HABITAT?

No.

---

13. IS THE PROPERTY AFFECTED BY A ROAD WIDENING OR ROAD REALIGNMENT under the Roads Act, any environmental planning instrument or any Council resolution?

No.

---

14. IS THE PROPERTY RESERVED FOR ACQUISITION BY A PUBLIC AUTHORITY UNDER ANY ENVIRONMENTAL PLAN OR PROPOSED ENVIRONMENTAL PLAN?

No.

---

15. IS THE PROPERTY PART OF ANY APPLICATION DECLARED TO BE "STATE SIGNIFICANT DEVELOPMENT"?

(Development is judged to be "State significant" if the Minister for Planning declares it to be so based on substantial cost of development, significant numbers of employees or other criteria. If you have any further enquiries please contact the Department of Planning, Tel: 02 9228 6333 or email information@planning.nsw.gov.au..

No.

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16. IS THE PROPERTY AFFECTED BY SECTION 38 OR 39 OF THE COASTAL PROTECTION ACT?

No.

---

17. IS THE PROPERTY WITHIN A "PROCLAIMED MINE SUBSIDENCE DISTRICT"?

No.

---

18. IS THE PROPERTY AFFECTED BY ONE OF THE MATTERS PRESCRIBED BY SECTION 59(2) OF THE CONTAMINATED LAND MANAGEMENT ACT 1997?

No.

SPECIAL NOTE: If you have any concerns about land contamination beyond the information described in this certificate, you should contact the NSW Office of Environment & Heritage. Tel:131 555 or email info@environment.nsw.gov.au.

---

19. IS THE PROPERTY BUSH FIRE PRONE LAND?

The land is bush fire prone land.

"Bush fire prone land" is defined in section 4 of the Environmental Planning & Assessment Act 1979 as meaning "land recorded for the time being as bushfire prone land on a bush fire prone land map for the area."

"The "area" is the local government area of Ku-ring-gai."

"The bush fire prone land map referred to in the definition may be inspected at the office of the Council."

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20. IS THE PROPERTY, LAND TO WHICH A PROPERTY VEGETATION PLAN UNDER THE *NATIVE VEGETATION ACT 2003* APPLIES?

No.

---

21. IS THE PROPERTY, LAND SUBJECT TO AN ORDER UNDER THE *TREE (DISPUTES BETWEEN NEIGHBOURS) ACT 2006*?

The land is not known to be subject to such order.

---

22. IS THE PROPERTY SUBJECT TO DIRECTIONS UNDER PART 3A MAJOR INFRASTRUCTURE AND OTHER PROJECTS of the Environmental Planning & Assessment Act 1979 No.203?

No.

---

23. IS THE PROPERTY SUBJECT TO A CURRENT SITE COMPATIBILITY CERTIFICATE AND CONDITIONS FOR SENIORS HOUSING under the provisions of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004?

No.

---

24. IS THE PROPERTY SUBJECT TO A VALID SITE COMPATIBILITY CERTIFICATE FOR INFRASTRUCTURE issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007?

No.

---

25. IS THE PROPERTY SUBJECT TO A VALID SITE COMPATIBILITY CERTIFICATE AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING issued under clause 37 of State Environmental Planning Policy (Affordable Rental Housing) 2009?

No.

---

26. IS THE PROPERTY SUBJECT TO AN EXEMPTION UNDER SECTION 23 OR AUTHORISATION UNDER SECTION 24 OF THE NATIONAL BUILDING AND JOBS PLAN (*STATE INFRASTRUCTURE DELIVERY) ACT 2009*?

No.

---

27. IS THE PROPERTY, LAND THAT IS BIODIVERSITY CERTIFIED LAND WITHIN THE MEANING OF PART 7AA OF THE THREATENED SPECIES CONSERVATION ACT 1995?

No.

Special Note: For further information about the Biodiversity Certified Land contact the NSW Office of Environment & Heritage. Tel:131 555 or email info@environment.nsw.gov.au.

---

28. IS THE PROPERTY, LAND TO WHICH A BIOBANKING AGREEMENT UNDER PART 7A OF THE THREATENED SPECIES CONSERVATION ACT 1995 RELATES?

No.

Special Note: For further information about the Biobanking agreement contact the Biobanking Team at NSW Office of Environment & Heritage. Tel:131 555 or email biobanking@environment.nsw.gov.au.

---

29. IS THE PROPERTY, LAND ON WHICH COMPLYING DEVELOPMENT MAY BE CARRIED OUT UNDER EACH OF THE CODES FOR COMPLYING DEVELOPMENT IN *STATE ENVIRONMENTAL PLANNING POLICY (EXEMPT AND COMPLYING DEVELOPMENT CODES) 2008* AND, IF COMPLYING DEVELOPMENT MAY NOT BE CARRIED OUT ON THAT LAND BECAUSE OF ONE OR MORE OF THE REQUIREMENTS UNDER CLAUSES 1.17A(c) AND (d) AND 1.19 OF THAT POLICY, WHY IT MAY NOT BE CARRIED OUT ON THAT LAND?

General Housing Code

Complying development under the General Housing Code **may not** be carried out on the land. The land is affected by specific land exemptions:

☐ The land is land that comprises, or on which there is, a heritage item.

Housing Alterations Code

Complying development under the Housing Internal Alterations Code **may not** be carried out on the land. The land is affected by specific land exemptions:

☐ The land is land that comprises, or on which there is, a heritage item.

General Development Code

Complying development under the General Development Code **may not** be carried out on the land. The land is affected by specific land exemptions:

☐ The land is land that comprises, or on which there is, a heritage item.

General Commercial and Industrial Code

Complying development under the General Commercial and Industrial Code **may not** be carried out on the land. The land is affected by specific land exemptions:

☐ The land is land that comprises, or on which there is, a heritage item.

Subdivision Code

Complying development under the Subdivision Code **may not** be carried out on the land. The land is affected by specific land exemptions:

☐ The land is land that comprises, or on which there is, a heritage item.

Demolition Code

Complying development under the Demolition Code **may not** be carried out on the land. The land is affected by specific land exemptions.

☐ The land is land that comprises, or on which there is, a heritage item.

SPECIAL NOTE: *The above question relates to whether or not the land falls within an exclusion area under Clauses 1.17A(c) and (d) and 1.19 of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. It is your responsibility to ensure that you comply with any other general requirements of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008. Failure to comply with these provisions may mean that a Complying Development Certificate issued under the provisions of the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 is invalid.*

30. DO ANY ADOPTED COUNCIL POLICIES OR RESOLUTIONS OR ANY POLICIES ADOPTED BY A PUBLIC AUTHORITY REQUIRED TO BE REFERRED TO IN A PLANNING CERTIFICATE RESTRICT THE DEVELOPMENT OF THE PROPERTY DUE TO THE LIKELIHOOD OF LANDSLIP, BUSHFIRES, TIDAL INUNDATION, SUBSIDENCE, CONTAMINATION, ACID SULPHATE SOILS OR ANY OTHER RISK (OTHER THAN FLOODING)?

Note: A review of Council's readily available records has been conducted to identify previous land uses that may have caused land contamination. This review did not reveal any reason for contamination of this property. However, prior to urban settlement, sizeable areas of Ku-ring-gai were covered by agricultural and horticultural activities. These uses are listed in the Managing Land Contamination Planning Guidelines as activities that may cause contamination. If you are concerned about possible contamination of the site you should make your own investigations regarding the condition of this property.

31. DO ANY ADOPTED COUNCIL POLICIES OR RESOLUTIONS OR ANY POLICIES ADOPTED BY A PUBLIC AUTHORITY REQUIRED TO BE REFERRED TO IN A PLANNING CERTIFICATE EFFECT THE DEVELOPMENT OF THE PROPERTY DUE TO FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION?

The following additional information is issued under Section 149(5).

32. IS LAND SLIP OR SUBSIDENCE LIKELY TO RESTRICT DEVELOPMENT OF THE LAND?

No.

SPECIAL NOTE: Some lots in the Ku-ring-gai Local Government area contain filling and/or road batters which may be subject to settlement and require special consideration in the design of foundations.

33. IS FLOODING LIKELY TO RESTRICT DEVELOPMENT OF THE LAND?

Some properties in the Ku-ring-gai Local Government area contain or adjoin natural drainage paths, pipelines, watercourses and depressions. During major rainfall or blockage of the drainage system surface water may affect the site or restrict future development.

SPECIAL NOTE: The Department of Infrastructure, Planning & Natural Resources and the Department of Commerce have not indicated any private property which may be affected by flooding of major rivers or creeks in the Ku-ring-gai Local Government area.

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34. OTHER INFORMATION RELATING TO DEVELOPMENT OF THE SITE.

A Tree Preservation Order applies to all land in the Ku-ring-gai Local Government Area. The Order aims to conserve Ku-ring-gai's tree canopy. The Order prohibits the ring barking, cutting down, lopping, pruning, removing, injuring or wilful destruction of any tree with a height greater than 5 metres or a canopy spread greater than 4 metres, unless the owner has the written consent of Council. A penalty can be imposed if the requirements of the Order are not complied with. For more information on the Tree Preservation Order please contact Council's Customer Service on 9424-0000.

This land may contain threatened species, populations and ecological communities listed under the Threatened Species Conservation Act 1995 (NSW) and or the Environment Protection Biodiversity Conservation Act 1999 (Commonwealth). For more information contact the Department of Environment, Climate Change and Water, Tel: 99955000.

This land may contain one or more of the following endangered or critically endangered ecological communities as described in the final determination of the scientific committee to list the ecological communities under Part 3 of Schedule 1 or Part 2 of Schedule 1A of the Threatened Species Conservation Act 1995 (NSW) :

Blue Gum High Forest,
Duffys Forest Ecological Community in the Sydney Basin Bioregion,
Sydney Turpentine Ironbark Forest
Coastal Upland Swamp

For more information contact NSW Environment & Heritage. Tel:131 555 or email info@environment.nsw.gov.au

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35. DO YOU NEED TO REFER TO ANY OTHER DOCUMENTS?

Yes. The Environmental Planning and Assessment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998. Your solicitor will have a copy of this legislation or it may be obtained from the Government Information Office.

John McKee
General Manager,
Per

APPENDIX C4

Site History Documents – WorkCover Records

MD.

2 JAN 2013

WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Our Ref: D12/198194
Your Ref: Mitchell Delaney

21 December 2012

Attention: Mitchell Delaney
Environmental Investigation Services
PO Box 976
North Ryde BC NSW 1670

Dear Mr Delaney,

RE SITE: 172A Fox Valley Rd Wahroonga NSW

I refer to your site search request received by WorkCover NSW on 19 December 2012 requesting information on licences to keep dangerous goods for the above site.

A search of the Stored Chemical Information Database (SCID) and the microfiche records held by WorkCover NSW has not located any records pertaining to the above mentioned premises.

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely

Brent Jones
Senior Licensing Officer
Dangerous Goods Team

WORK SAFE HOME SAFE

APPENDIX D

Abbreviations, Sampling Protocols and QA/QC Definitions

ABBREVIATIONS

AEC	Area of Environmental Concern
AGST	Above Ground Storage Tank
AHD	Australian Height Datum
ALTPQL	All Less than PQL
ANZECC	Australian and New Zealand Environment Conservation Council
ASS	Acid Sulfate Soil
BA/DA	Building Approval and Development Application
B(a)P	Benzo(a)pyrene
BGL	Below Ground Level
BH	Borehole
BOM	Bureau of Meteorology
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
COC	Chain of Custody documentation
CLM	Contaminated Land Management
CMP	Construction Management Plan
CSM	Conceptual Site Model
CT	Contamination Threshold
DBYD	Dial Before You Dig
DEC	Department of Environment and Conservation (now part of EPA)
DECC	Department of Environment and Climate Change (now part of EPA)
DECCW	Department of Environment, Climate Change and Water (now part of EPA)
DWE	NSW Department of Water and Energy
DO	Dissolved Oxygen
DP	Deposited Plan
DQIs	Data Quality Indicators
DQOs	Data Quality Objective
EC	Electrical Conductivity
Eh	Redox Potential
EILs	Ecological Investigation Levels
ENM	Excavated Natural Material
EMP	Environmental Management Plan
ESA	Environmental Site Assessment
FR	Field Rinsate
GAI	General Approvals of Immobilisation
GILs	Groundwater Investigation Levels
GPS	Global Positioning System
Hazmat	Hazardous Materials Assessment
HILs	Health Based Investigation Level
HM	Heavy Metals
HMTVs	Hardness Modified Trigger Values
LNAPLs	Light Non-Aqueous Phase Liquids
NATA	National Association of Testing Authorities
NDLR	Not Detected at Limit of Reporting
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
NSW EPA	Environmental Protection Authority of NSW
MGA	Map Grid of Australia
OCPs	Organochlorine Pesticides
OEH	NSW Office of Environment and Heritage
OPPs	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons

ABBREVIATIONS

PASS	Potential ASS
PCC	Potential Contaminants of Concern
PCBs	Polychlorinated Biphenyls
PID	Photo-ionisation Detector
POEO	Protection of Environmental Operations
PPIL	Provisional Phyto-toxicity Investigation Levels
PQL	Practical Quantitation Limit
RAP	Remediation Action Plan
RL	Reduced Level
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SAQP	Sampling, Analysis and Quality Plan
SAS	Site Audit Statement
SCC	Specific Contamination Concentration
SD	Standard Deviation
SEPP	State Environmental Planning Policy
sPOCAS	suspension Peroxide Oxidation Combined Acidity and Sulfate
SPT	Standard Penetration Test
SVOCs	Semi-Volatile Organic Compounds
SWL	Standing Water Level
TB	Trip Blank
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TP	Test Pit
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
TS	Trip Spike
USEPA	United States Environmental Protection Agency
UCL	Upper Confidence Limit
UPSS	Underground Petroleum Storage Systems
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
WC	Waste Classification
WHS	Workplace, Health and Safety

SOIL AND GROUNDWATER SAMPLING PROTOCOLS

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS. The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

Soil Sampling

a) Prepare a test pit/borehole log.

b) Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill/rig excavator such that the drill rig/excavator can operate in a safe manner.

c) Ensure all sampling equipment has been decontaminated prior to use.

d) Remove any surface debris from the immediate area of the sampling location.

e) Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possibly to prevent the loss of volatiles. If possible, fill the glass jars completely.

f) Collect samples for asbestos analysis and place in a zip-lock plastic bag.

g) Label the jar and/or bag with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).

h) Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.

i) Record the lithology of the sample and sample depth on the borehole/test pit log in accordance with AS1726-1993[33].

j) Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with AS 4482.1:2005, AS 4482.2:1999 and AS/NZS 5667.1:1998.

k) Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.

l) Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

Decontamination Procedures for Soil Sampling Equipment

a) All of the equipment associated with the soil sampling procedure should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent (Decon 90)
   - Potable water
   - Stiff brushes
   - Plastic sheets

c) Ensure the decontamination materials are clean prior to proceeding with the decontamination.

d) Fill both buckets with clean potable water and add phosphate free detergent to one bucket.

e) In the bucket containing the detergent scrub the sampling equipment until all the material attached to the equipment has been removed.

f) Rinse sampling equipment in the bucket containing potable water.

---

[33] *Geotechnical Site Investigations*, Standards Australia 1993 (AS1726-1993)

g) Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes that equipment should not be used until it has been thoroughly cleaned.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

a) After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.

b) Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.

c) Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.

d) Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or low flow) techniques. Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
   - Micropore filtration system or Stericup single-use filters (for heavy metals samples).
   - Filter paper for Micropore filtration system.
   - Bucket with volume increments.
   - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles.
   - Bucket with volume increments.
   - Flow cell.
   - pH/EC/Eh/T meters.
   - Plastic drums used for transportation of purged water.
   - Esky and ice.
   - Nitrile gloves.
   - Distilled water (for cleaning).
   - Electronic dip meter.
   - Micro-purge pump pack and pump head.
   - Air and water tubing for Micro-purge.
   - Groundwater sampling forms.

e) If single-use stericup filtration is not being used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.

f) Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.

g) Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.

h) Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.

i) During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.

j) All measurements are recorded on specific data sheets.

k) Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.

l) All samples are preserved in accordance with water sampling requirements detailed in the NEPM 1999 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice in accordance with AS/NZS 5667.1:1998.

m) Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

Decontamination Procedures for Groundwater Sampling Equipment

a) All of the equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.

b) The following equipment and materials are required for the decontamination procedure:
   - Phosphate free detergent.
   - Potable water.
   - Distilled water
   - Plastic Sheets or bulk bags (plastic bags)

c) Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.

d) Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.

e) Flush pump head with distilled water.

f) Change water and detergent solution after each sampling location.

g) Rinse sampling equipment in the bucket containing distilled water.

h) Place cleaned equipment on clean plastic sheets.

i) If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned

QA/QC DEFINITIONS

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994[34]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[35]).

Practical Quantitation Limit (PQL), Limit of Reporting (LOR) and Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection limit (MDL) for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations.*"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit"* Keith 1991.

Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

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[34] *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* US EPA, 1994 (US EPA SW-846)

[35] *Environmental Sampling and Analysis, A Practical Guide*, Keith, H, 1991 (Keith 1991)

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

Comparability

Comparability is the evaluation of the similarity of conditions (eg. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel;
- Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result} - \text{Sample Result)}}{\text{Concentration of Spike Added}} \times 100$$

Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2)}{\{(D1 + D2)/2\}} \times 100$$