



ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

DESIGNINC SYDNEY PTY LTD

ON

PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT

FOR

**PROPOSED LINDFIELD LEARNING VILLAGE
DEVELOPMENT**

AT

ETON ROAD, LINDFIELD

15 MARCH 2017

REF: E30259KMrpt



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EXECUTIVE SUMMARY

Designinc Sydney Pty Ltd commissioned EIS to undertake a Preliminary Environmental Site Assessment (ESA) for the proposed Lindfield Learning Village development at Eton Road, Lindfield. The proposed development includes refurbishment of the existing facilities of the former UTS Lindfield campus to provide an education facility which will include schools, childcare facilities and a training centre. Demolition of the existing facilities, excavation works or significant construction works are not understood to be part of the proposed development.

A review of the site's history indicated that it was likely to have been undisturbed bushland until 1915, when it was acquired for use as an army rifle range. The rifle range appears to have actually been located approximately 150m south-east of the site. Development occurred on the site from the 1960s with the construction of brick and concrete buildings and roadways within landscaped areas. The site was used as an education facility since development occurred and served as the UTS campus for approximately 25 years until its closure at the end of 2015.

Potential contamination sources include fill material that may have been used during construction, the former rifle range, the use of pesticides and hazardous building materials. Considering the above, and based on a qualitative assessment of various lines of evidence as discussed throughout this report, EIS are of the opinion that there is a low potential for widespread significant site contamination. If contamination is present it is likely to be located in discrete locations or hotspots.

As the proposed development does not involve excavation or construction, based on the assessment and the perceived potential for contamination, widespread investigation of the contamination conditions is not considered to be required at this stage. However, we would recommend an investigation of any unpaved areas where children could potentially come into regular contact with soil (e.g. play areas associated with the kindergarten). A hazardous building material assessment should be undertaken prior to any refurbishment works.

EIS are of the opinion that the site can be made suitable for the proposed development provided that the recommendations in Section 6.2 are completed.

If the development is altered to include demolition of existing buildings, excavation or construction of new buildings, we recommend that further investigation be conducted within the proposed development area, which may include soil and groundwater sampling.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of the report.

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Proposed Development Details	1
1.2	Aim and Objectives	1
1.3	Scope of Work	1
2	SITE INFORMATION	3
2.1	Site Identification	3
2.2	Site Location and Regional Setting	3
2.3	Topography	3
2.4	Site Inspection	3
2.5	Surrounding Land Use	4
2.6	Underground Services	4
2.7	Section 149 Planning Certificate	5
3	GEOLOGY AND HYDROGEOLOGY	6
3.1	Regional Geology	6
3.2	Acid Sulfate Soil Risk and Planning	6
3.3	Hydrogeology	6
3.4	Receiving Water Bodies	6
4	SITE HISTORY INFORMATION	7
4.1	Review of Historical Aerial Photographs	7
4.2	Review of Historical Land Title Records	8
4.3	SafeWork NSW Records	8
4.4	NSW EPA Records	8
4.5	Other Sources	9
4.6	Summary of Site History Information	9
4.7	Integrity of Site History Information	9
5	CONCEPTUAL SITE MODEL (CSM)	10
5.1	Potential Contamination Sources, Areas of Environmental Concern (AEC) and Contaminants of Potential Concern (CoPC)	10
5.2	Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways	11
5.3	Assessment of Data Gaps	12
6	CONCLUSIONS	13
6.1	Contamination Sources/AEC and Potential for Site Contamination	13
6.2	Assessment of the Need for Further Investigation	13
6.3	Conclusions and Recommendations	14
7	LIMITATIONS	15

List of In-Text Tables

Important Information About The Site Assessment Report

REPORT FIGURES:

Figure 1: Site Location Plan

Figure 2: Site Features Plan

APPENDICES:

Appendix A: Site Information

Appendix B: Site History Information

ABBREVIATIONS

Asbestos Containing Material	ACM
Area of Environmental Concern	AEC
Australian Height Datum	AHD
Acid Sulfate Soil	ASS
Above-Ground Storage Tank	AST
Below Ground Level	BGL
Bureau of Meteorology	BOM
Benzene, Toluene, Ethylbenzene, Xylene	BTEX
Cation Exchange Capacity	CEC
Contaminant(s) of Potential Concern	CoPC
Contaminated Land Management	CLM
Conceptual Site Model	CSM
Environmental Investigation Services	EIS
Environmental Protection Authority	EPA
Environmental Site Assessment	ESA
International Organisation of Standardisation	ISO
Local Government Authority	LGA
Metres Below Ground Level	mBGL
National Association of Testing Authorities	NATA
National Environmental Protection Measure	NEPM
Non-Aqueous Phase Liquid	NAPL
Organochlorine Pesticides	OCP
Organophosphate Pesticides	OPP
Polycyclic Aromatic Hydrocarbons	PAH
Remediation Action Plan	RAP
Sampling, Analysis and Quality Plan	SAQP
Site Audit Statement	SAS
Site Audit Report	SAR
Semi-Volatile Organic Compounds	sVOC
Standing Water Level	SWL
Total Recoverable Hydrocarbons	TRH
United States Environmental Protection Agency	USEPA
Underground Storage Tank	UST
Volatile Organic Compounds	VOC
Work Health and Safety	WHS

1 INTRODUCTION

Designinc Sydney Pty Ltd ('the client') commissioned Environmental Investigation Services (EIS)¹ to undertake a Preliminary Environmental Site Assessment (ESA) for the proposed Lindfield Learning Village development at Eton Road, Lindfield. The site location is shown on Figure 1 and the assessment 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.

1.1 Proposed Development Details

Based on the details provided, EIS understand that the proposed development includes refurbishment of the existing facilities of the former UTS Lindfield campus to provide school facilities for students from kindergarten to Year 12, childcare facilities, an Intensive English Centre, Department of Education offices, a centre for education research and a conference and training centre. Demolition of the existing facilities, excavation works or significant construction works are not understood to be part of the proposed development.

1.2 Aim and Objectives

The primary aims of the assessment were to identify past or present potentially contaminating activities at the site, identify the potential for site contamination, assess the need for further investigation, and make a preliminary assessment of the suitability of the site for the proposed development. The assessment objectives were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and use via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Prepare a conceptual site model (CSM); and
- Assess whether an intrusive investigation is required.

1.3 Scope of Work

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP44248KMrev1) of 8/2/17 and written acceptance from the client of 28/2/17. The scope of work included the following:

- A review of available site information;
- A walkover site inspection; and
- Preparation of a report presenting the results of the assessment.

The report was prepared with reference to regulations and guidelines outlined in the following table. Individual guidelines are also referenced within the text of the report.

¹ Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

Table 1-1: Guidelines

Guidelines/Regulations/Documents
Contaminated Land Management Act (1997) ²
State Environmental Planning Policy No.55 – Remediation of Land (1998) ³
Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998) ⁴
Guidelines for Consultants Reporting on Contaminated Sites (2011) ⁵
Guidelines for the NSW Site Auditor Scheme, 2nd Edition (2006) ⁶
National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) ⁷

² NSW Government Legislation, (1997). *Contaminated Land Management Act 1997*. (referred to as CLM Act 1997)

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

⁴ Department of Urban Affairs and Planning, and Environment Protection Authority, (1998). *Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land*. (SEPP55 Planning Guidelines)

⁵ NSW Office of Environment and Heritage (OEH), (2011). *Guidelines for Consultants Reporting on Contaminated Sites*. (referred to as Reporting Guidelines 2011)

⁶ NSW DEC, (2006). *Guidelines for the NSW Site Auditor Scheme, 2nd ed.* (referred to as Site Auditor Guidelines 2006)

⁷ National Environment Protection Council, (2013). *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 1999* (as amended 2013). (referred to as NEPM 2013)

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Current Site Owner:	NSW Minister for Education
Site Address:	Eton Road, Lindfield, NSW, 2070 (Listed in some sources as 100 Eton Rd, unnumbered in other sources.)
Lot & Deposited Plan:	Lot 2 DP1151638
Current Land Use:	Vacant
Proposed Land Use:	Education
Local Government Authority:	Ku-ring-gai Council
Current Zoning:	Part zoned B4 Mixed Use Part zoned E3 Environmental Management Part zoned R1 General Residential
Site Area:	Approximately 5ha
RL (AHD) (approx.):	50m – 66m
Geographical Location (decimal degrees) (approx.):	Latitude: -33.789969° Longitude: 151.160619°

2.2 Site Location and Regional Setting

The site is located close to a predominantly residential area of Lindfield, as shown on Figure 1.

2.3 Topography

The site is located on the crest of a hill, which in the vicinity of the site generally slopes downwards towards the south.

2.4 Site Inspection

A walkover inspection of the site was undertaken by EIS on 9 March 2017. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was not undertaken. Selected site photographs obtained during the inspection are attached in the appendices. The general layout of the site at the time of the inspection is shown in Figure 2.

Signage at various locations across the site indicated that it had most recently served as the Kuring-gai campus of the University of Technology Sydney (UTS). At the time of the inspection the site consisted of a variety of multi-level brick and concrete buildings, some interconnected, surrounded by landscaped areas and bushland. Two asphaltic concrete paved car parking areas were located in the eastern section of the site. Concrete and asphaltic concrete roads and footpaths were situated at various locations around the site.

No obvious signs of potentially contaminating activities were observed. A hazardous materials storage area was observed within a ground staff works area. The storage area was located within a brick building with a concrete floor which was observed to be in good condition.

2.5 Surrounding Land Use

During the site inspection, EIS observed the following land uses in the immediate surrounds:

- North – football field, roads, asphaltic-concrete paved roads, residential buildings;
- South – bushland, Blue Gum Creek;
- East – bushland, Sugarbag Creek; and
- West – bushland.

EIS did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site.

2.6 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the assessment in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration.

The plans indicate that a sewer main extends from a point on the north-western boundary of the site through to the south of the site. A copy of the sewer plan is contained in the appendices.

An Optus fibre optic cable extends from the northern section of the site towards the buildings in the centre of the site. A copy of the Optus plan is contained in the appendices.

A variety of other internal underground services were observed at various locations across the site. If contamination is present at the site, the underground service trenches have the potential to act as preferential pathways for contamination migration.

2.7 Section 149 Planning Certificate

The s149 (2 and 5) planning certificates were reviewed for the assessment. Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The site is not located within a conservation area and does not include or comprise critical habitat;
- The site is not affected by any of the matters prescribed by Section 59(2) of the CLM Act 1997;
- The site is not located within an acid sulfate soil risk area; and
- The site is listed as a heritage item under the provisions of Ku-ring-gai Local Environmental Plan 2015.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

A review of the regional geological map of Sydney (1983⁸) indicates that the site is underlain by Hawkesbury Sandstone, which typically consists of medium to coarse grained quartz sandstone with minor shale and laminite lenses.

3.2 Acid Sulfate Soil Risk and Planning

The site is not located in an acid sulfate soil (ASS) risk area according to the risk maps prepared by the Department of Land and Water Conservation.

However as the site is located within 500m of a Class 1-4 acid sulfate soil area in the Ku-ring-gai Local Environmental Plan 2015, it is automatically considered to be located within a Class 5 area. Works in Class 5 areas that could pose an environmental risk in terms of ASS include works which are likely to lower the water table below 1m AHD on the adjacent land Class 1-4 land. This is not considered likely for the proposed development.

The nearest Class 1-4 area is located approximately 100m to the south of the site and is associated with Blue Gum Creek.

3.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report (attached in the appendices) indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive aquifers of low to moderate productivity. There were four registered bores within 500m of the site, located to the west of the site. In summary:

- The nearest registered bore was located approximately 190m from the site;
- All four of the nearest bores were registered for monitoring purposes;
- The driller's log information from the closest registered bores typically identified sandy soils over relatively shallow sandstone bedrock.

The information reviewed for this assessment indicated that the subsurface conditions at the site are likely to consist of residual soils overlying shallow sandstone bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low.

3.4 Receiving Water Bodies

The site location and regional topography indicates that excess surface water flows have the potential to enter Blue Gum Creek, located approximately 100m to the south of the site, and Sugerbag Creek, located approximately 100m east of the site. The creeks are considered to be potential receptors.

⁸ Department of Mineral Resources, (1983). *1:100,000 Geological Map of Sydney (Series 9130)*.

4 SITE HISTORY INFORMATION

4.1 Review of Historical Aerial Photographs

Historical aerial photographs included in the attached Lotsearch report have been reviewed as summarised below.

1943: the site appeared to be relatively undisturbed bushland. Several tracks appeared to cross sections of the site. The surrounding areas also appeared to be mostly relatively undisturbed bushland with the exception of some areas to the south of Blue Gum Creek where some residential development appeared to have occurred, and some tracks or roads through the bushland. An earthworks structure was visible to the south-east of the site on the edge of the bushland. This was the most likely location of the rifle range mentioned on the UTS website (see Section 4.5).

1956: the site appeared similar to its appearance in the 1943 photograph. The surrounding areas appeared similar to their appearance in the 1943 photograph, except that residential development appeared to have occurred north of the site along Abingdon Road and Winchester Avenue. The rifle range to the south-east of the site was still visible.

1961: the site and surrounding areas appeared similar to their appearance in the 1956 photograph, with the exception of additional construction to the north of the site of what appeared to be commercial or industrial buildings. The rifle range to the south-east of the site appeared to be overgrown.

1965: the site and surrounding areas appeared similar to their appearance in the 1961 photograph.

1970: the site had undergone development with the construction of several large buildings and car parking areas. The area to the north-west of the site where the football field is currently located appeared to be under construction. The surrounding areas appeared similar to the 1965 photograph.

1982: additional buildings had been constructed on the site. The football field to the north-west of the site appeared to be complete and five tennis courts had been constructed to the south of the field. The surrounding areas appeared similar to the 1970 photograph, with the addition of a large car park to the west of the commercial buildings north of the football field.

1991: the site and surrounding areas appeared similar to the 1982 photograph, with the exception of an additional building in the south-western section of the site.

2005: the site and surrounding areas appeared similar to their appearance in the 1991 photograph.

2009: the site and surrounding areas appeared similar to their appearance in the 2005 photograph.

2014: the site appeared similar to its appearance in the 2009 photograph. The surrounding areas also appeared similar, with the exception of the construction of additional buildings to the west of the site in the location of the former tennis courts and the construction of additional buildings to the north-east of the site in the location of a former car parking area.

4.2 Review of Historical Land Title Records

Historical land title records were reviewed for the assessment. Copies of the title records are attached in the appendices. The title records indicate the following:

- The site or portions of the site appear to have been Crown land since 1915;
- The site was leased to Sydney County Council from 1974 to 1988;
- The site was owned by the Minister for Education, Training and Youth Affairs from 1988 to 1994;
- The site was owned by the University of Technology (UTS), Sydney from 1994 to 2013; and
- The site was owned by the Minister of Education from 2013 to-date.

The land title records did not identify any particular land uses which could have resulted in significant contamination.

4.3 SafeWork NSW Records

SafeWork NSW records for licences to store dangerous goods at the site have been ordered, but had not been received at the time of writing.

4.4 NSW EPA Records

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

Table 4-1: Summary of NSW EPA Online Records

Source	Details
CLM Act 1997 ⁹	There were no notices for the site under Section 58 of the Act.
NSW EPA List of Contaminated Sites ¹⁰	The site is not listed on the NSW EPA register.
POEO Register ¹¹	There were no notices for the site on the POEO register.

⁹ <http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx>, visited on 14/3/17

¹⁰ <http://www.epa.nsw.gov.au/clm/publiclist.htm>, visited on 14/3/17

¹¹ <http://www.epa.nsw.gov.au/prpoeoapp/>, visited on 14/3/17

4.5 **Other Sources**

The UTS website¹² provided the following historical information on the site:

- The land was acquired by the government in 1915 for use as an army rifle range. The aerial photographs indicated that the actual target range was located approximately 150m to the south-east of the site boundary. The site itself would likely have been part of a safety zone behind the target range;
- In 1961 the state government had made a decision to build a public institution on the land;
- By 1973 the facility was being used as a teachers' college and changed its name to the Kuring-gai College of Advanced Education;
- In 1990 the College merged with UTS and the site operated as the UTS Kuring-gai campus; and
- UTS stopped using the facilities at the end of 2015.

4.6 **Summary of Site History Information**

A summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by EIS.

Table 4-2: Summary of Historical Land Uses

Year(s)	Potential Land Use	Supporting Evidence
Pre-1915	Bushland	Aerial photographs
1915 to late 1960s	Bushland behind an army rifle range	UTS website, aerial photographs
Late 1960s to 2015	Educational institution	Aerial photographs, land title records, UTS website.

4.7 **Integrity of Site History Information**

The majority of the site history information was obtained from government organisations as outlined in the relevant sections of this report. 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 lack of specific land use details over time.

¹² <http://newsroom.uts.edu.au/news/2015/10/history-in-the-making> visited on 14/3/17

5 **CONCEPTUAL SITE MODEL (CSM)**

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the available site information. Reference should also be made to the figures attached in the appendices.

5.1 **Potential Contamination Sources, Areas of Environmental Concern (AEC) and Contaminants of Potential Concern (CoPC)**

The potential contamination sources, AEC and CoPC are presented in the following table:

Table 5-1: Potential Contamination Sources, AEC and Contaminants of Potential Concern

Source / AEC	CoPC
<u>Fill material</u> - The majority of the site appears to have been built at the level of the existing landscape. It is possible that fill material may have been used in some areas. If so, the fill may have been contaminated as environmental controls were less stringent at the time the buildings were constructed.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
<u>Land behind a rifle range</u> – Stray bullets may have landed on the site. Most of the bullets would have been stopped by the earthworks around the target.	Lead
<u>Use of pesticides</u> – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals, OCPs and OPPs
<u>Hazardous Building Material</u> – Hazardous building materials may be present in the existing buildings on site.	Asbestos, lead and PCBs

5.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources and AEC are outlined in the following table:

Table 5-2: CSM Table

Potential mechanism for contamination	<p>Potential mechanisms for contamination include:</p> <ul style="list-style-type: none"> • Fill material – importation of impacted material, top-down impacts (e.g. leaching from surficial material), or sub-surface release (e.g. impacts from buried material); • Use as a rifle range – top-down impacts (e.g. leaching from surficial material); • Use of pesticides – top-down and spills (e.g. during normal use, application and/or improper storage); and • Hazardous building material – within current buildings.
Affected media	<p>Soil and soil vapour have been identified as potentially affected media. The potential for groundwater impacts is considered to be relatively low. However, groundwater would need to be considered in the event significant contamination was identified in soil.</p>
Receptor identification	<p>Potential human receptors include site occupants, construction workers and intrusive maintenance workers.</p> <p>Potential ecological receptors include terrestrial organisms and plants, and freshwater ecology in Blue Gum Creek and Sugarbag Creek.</p>
Potential Exposure pathways	<p>Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). The potential for exposure would typically be associated with construction and excavation works and use of unpaved areas and basements (i.e. vapour inhalation or incidental contact with groundwater seepage).</p> <p>Potential exposure pathways for ecological receptors include primary contact and ingestion.</p>
Presence of preferential pathways for contaminant movement	<p>The existing underground services (see Section 2.6) are potential preferential pathways for contaminant migration. This could occur via groundwater or seepage if present, or via soil and vapour migration through the service trench backfill.</p>

5.3 Assessment of Data Gaps

EIS has undertaken a preliminary data gap analysis based on the findings of assessment. The data gaps and our comments are outlined in the following table:

Table 5-3: Data Gap Assessment

Data Gap	EIS Comments
Council Records	The review of council records was limited to planning-related information within the section 149 certificate and within the Local Environmental Plan (as outlined in the Lotsearch report attached in the appendices). EIS are of the opinion that further review of council records such as building approval and development application records is unlikely to identify any information that would alter the outcome of the assessment at this stage.
SafeWork NSW	Due to time constraints, SafeWork NSW records were not obtained for this assessment. These records may contain relevant information for the site.
Soil and Groundwater Sampling	Soil and groundwater sampling and analysis was outside the scope of this assessment.

6 CONCLUSIONS

6.1 Contamination Sources/AEC and Potential for Site Contamination

Based on the scope of work undertaken for this assessment, EIS identified the following potential contamination sources:

- Fill material that may have been used during construction;
- The site was adjacent to a rifle range;
- Use of pesticides; and
- Hazardous building materials.

The risk associated with each of these sources is discussed further below:

- Fill material: the site appears to have been constructed over shallow bedrock. It is likely that most of the filling would have been undertaken using material cut from other sections of the site.
- Rifle range: the rifle range was approximately 150m to the south-east of the site. Most of the bullets would have been stopped by the earthworks around the targets. Any stray bullets falling on the site are likely to have been removed during earthworks for the initial buildings constructed in the 1960s.
- Pesticides. If used, pesticide application is likely to have been localised, e.g. beneath slabs or around building perimeters.
- Hazardous building materials: the most likely sources of hazardous building materials are the building infrastructure or buried rubble from building works. The risk associated with buried rubble is low unless disturbed. The risk associated with building infrastructure can be addressed by inspection and management or removal.

Considering the above, and based on a qualitative assessment of various lines of evidence as discussed throughout this report, EIS are of the opinion that there is a low potential for widespread significant site contamination. If contamination is present it is likely to be located in discrete locations or hotspots.

6.2 Assessment of the Need for Further Investigation

As the proposed development does not involve excavation or construction, based on the assessment and the perceived potential for contamination, widespread investigation of the contamination conditions is not considered to be required at this stage. However, we would recommend an investigation of any unpaved areas where children could potentially come into regular contact with soil (e.g. play areas associated with the kindergarten).

A hazardous building material assessment should be undertaken prior to any refurbishment works. An asbestos register for the buildings may already have been completed.

6.3 Conclusions and Recommendations

EIS are of the opinion that the site can be made suitable for the proposed development provided that the recommendations in Section 6.2 are completed.

If the development is altered to include demolition of existing buildings, excavation or construction of new buildings, we recommend that further investigation be conducted within the proposed development area, which may include soil and groundwater sampling.

EIS consider that the assessment objectives outlined in Section 1.2 have been addressed.

7 LIMITATIONS

The following limitation apply to this assessment:

- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- 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;
- This report has been prepared based on site conditions which existed at the time of the assessment; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- The 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 in the 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;
- 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;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- 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.

LIST OF IN-TEXT TABLES

Table 1-1: Guidelines	2
Table 2-1: Site Identification	3
Table 4-1: Summary of NSW EPA Online Records	8
Table 4-2: Summary of Historical Land Uses	9
Table 5-1: Potential Contamination Sources, AEC and Contaminants of Potential Concern	10
Table 5-2: CSM Table	11
Table 5-3: Data Gap Assessment	12

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 or landscaped areas are modified;
- The proposed development levels are altered, e.g. 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 (e.g. 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 problem, 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 rest 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.

SITE PHOTOGRAPHS



Plate 1: buildings and roadways in the northern section of the site, showing sandstone outcrops.



Plate 2: ground staff area in the south-western section of the site.



Plate 3: hazardous materials store within the ground staff area.

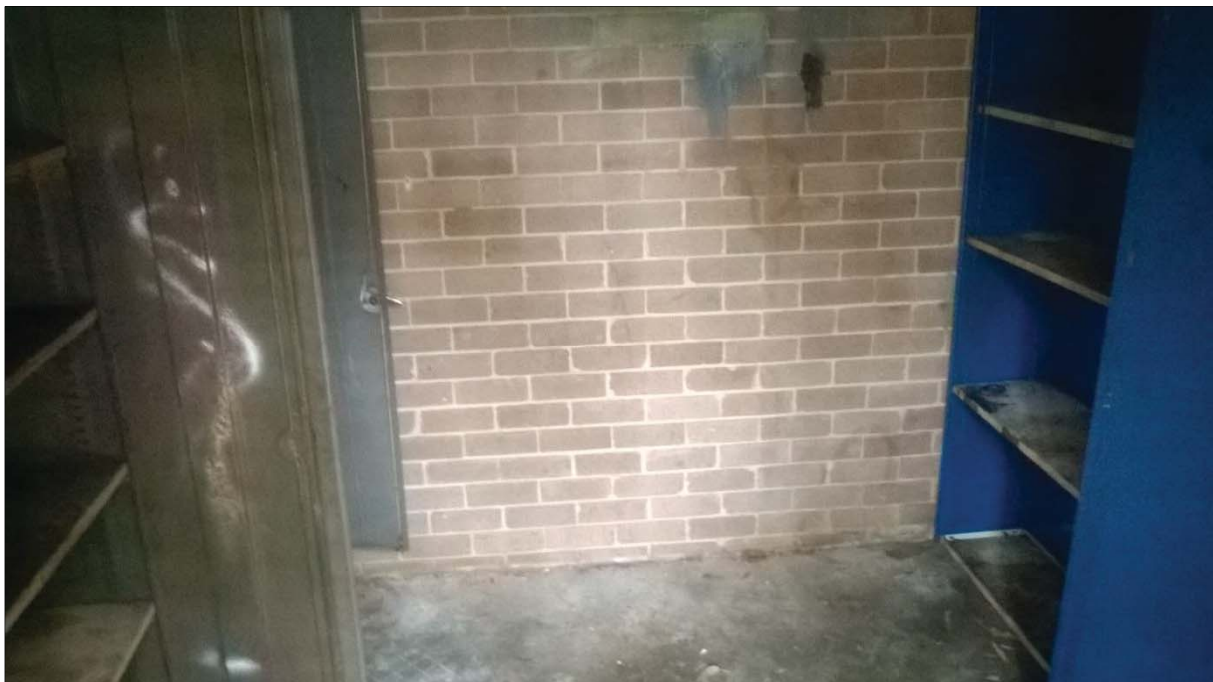


Plate 4: interior of the hazardous materials store.

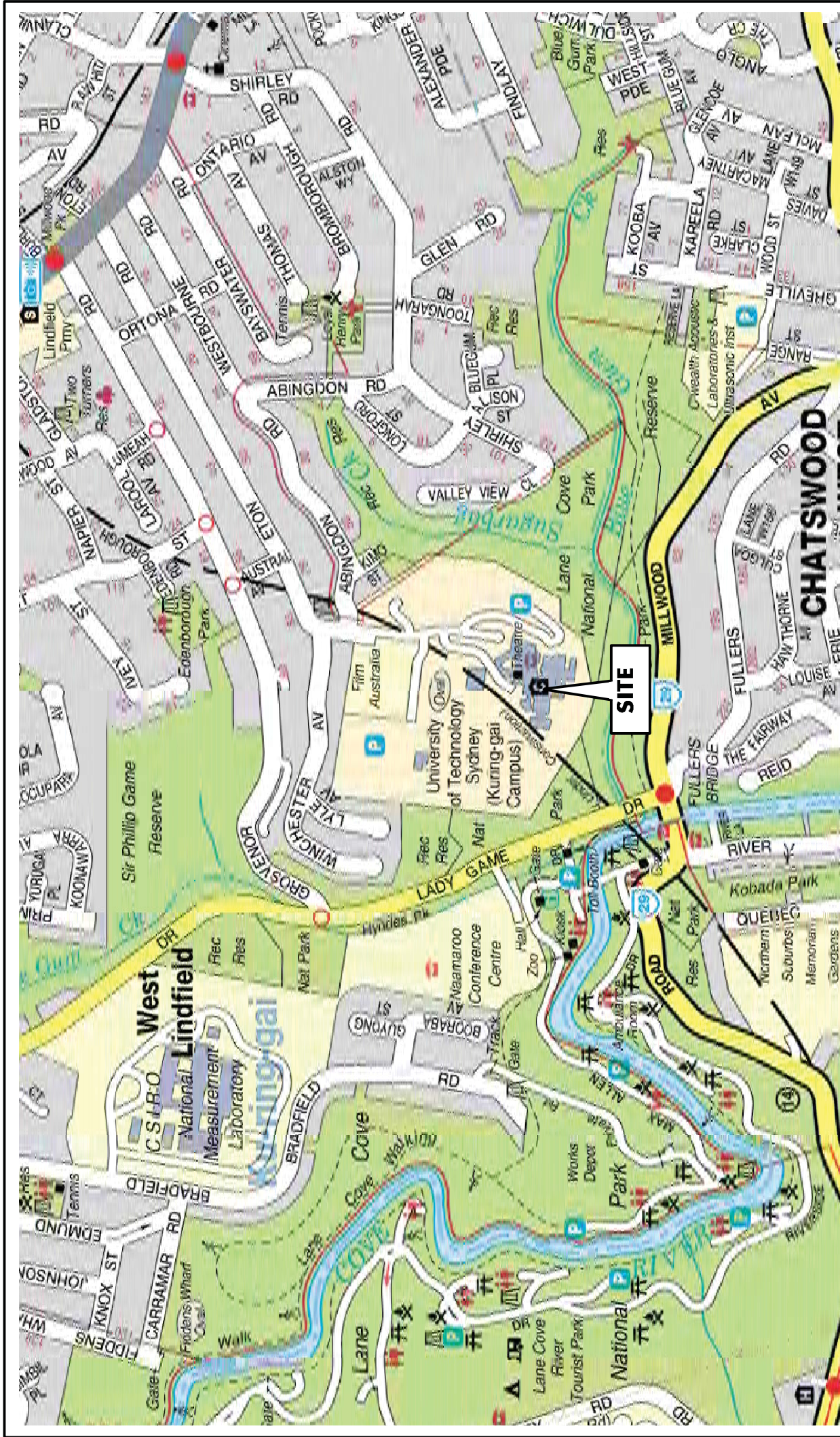


Plate 5: buildings in the southern section of the site.



Plate 6: buildings and roadways in the eastern section of the site.

REPORT FIGURES



NOTES:
Figure has been recreated from UBD on disc (version 7.1)
Figure is not to scale. UBD Map ref: 195 A7
This plan should be read in conjunction with
the EIS report.

