Site Audit Report 316 by Dr Ian Swane

REVIEW OF ESA'S & RAP FOR WESTERN SYDNEY UNIVERSITY – MILPERRA CAMPUS,

BULLECOURT AVENUE, MILPERRA NSW 2214

Final | 30 OCTOBER 2025



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ASSOCIATES

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Document title:	Site Audit Report 316
Document no.	1
Revision:	Final
Date:	30 OCTOBER 2025
Prepared by:	Dr Ian Swane
File name:	https://d.docs.live.net/d13c7702bd1fbdf1/Documents/IS^0A/Projects/Audit 316/Deliverables/Audit_RAP/SAR 316.docx

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1. Introduction

1.1 Background Information

This Site Audit Report (**SAR**) contains the results of a Statutory Site Audit for the Western Sydney University – Milperra Campus (the '**Site**'), which covers 19.64 ha of land in Milperra, Sydney. The Site is legally defined by Lot 1 in DP101147 and Lot 2 in DP1291984 and is located in the City of Canterbury-Bankstown ('**Council**') local government area (**LGA**). A location plan for the Site is provided in **Figure 1-1**.

Prior to the 1970's, the Site was used for market gardens and poultry farms with associated rural-residential structures. The Site was then redeveloped for educational uses in 1974, initially as a tertiary college. The name was changed to Macarthur Institute of Higher Education in 1983 and then merged into University of Western Sydney in 1989[1], which provided on-site accommodation, open space parkland, playing fields and associated infrastructure.

Mirvac in association with the NSW State Government proposed to redevelop the Site for low-density residential land use comprising 383 residential lots, 4 public / drainage reserve lots, and road corridors[2]. Due to its large area, the residential development was to occur in 7 stages ranging in area from 8,435 m^2 to 44,398 m^2. The layout and staging of the proposed residential subdivision is shown in **Figure 1-2**.

The audit was undertaken by Dr Ian Swane (NSW Environment Protection Authority (**EPA**) Accreditation No. 9821) in accordance with the NSW Contaminated Lands Management (**CLM**) Act 1997. For annual return purposes to the EPA, the audit is number 316 in the records of the Site Auditor. All site audit work was undertaken by Dr Swane and no input was obtained from his support team since all review work was within the expertise of the Site Auditor.

The Site Auditor checked the EPA website (www.epa.nsw.gov.au/clm) throughout the period of the project and found that the Site was not recorded as having an investigation or remediation order issued under the CLM Act or as having been notified to the EPA as a potentially contaminated site. There were also no properties within 200 m of the Site having a Record of Notice under the CLM Act. However, there were five properties in the Milperra area listed as having been notified to the EPA, with one of these located within 200 m of the Site. The EPA database listed this property as 286 Horsley Road, which is located adjacent to the Site on the eastern side of Horsley Road as shown in **Figure 1-3**. The EPA database recorded the property as being owned by Heatcraft Australia Pty Ltd, with regulation under the CLM Act not required. The Site Auditor considered the contamination risks to the Site posed by the Heatcraft Australia property needed to be assessed by the ESAs and considered by this audit.

The Site Auditor also identified the presence of a landfill to the south of the Site and the M5 Motorway referred to as Kelso Landfill (**Figure 1-4**). The Site Auditor considered the contamination risks to the Site posed by this landfill needed to be assessed by the ESAs and considered by this audit.

[1] https://dictionaryofsydney.org/search/?query=milperra
[2] Ref [51]

Figure 1-1 Site Location Plan

(Source: Figure 1, Ref [12])

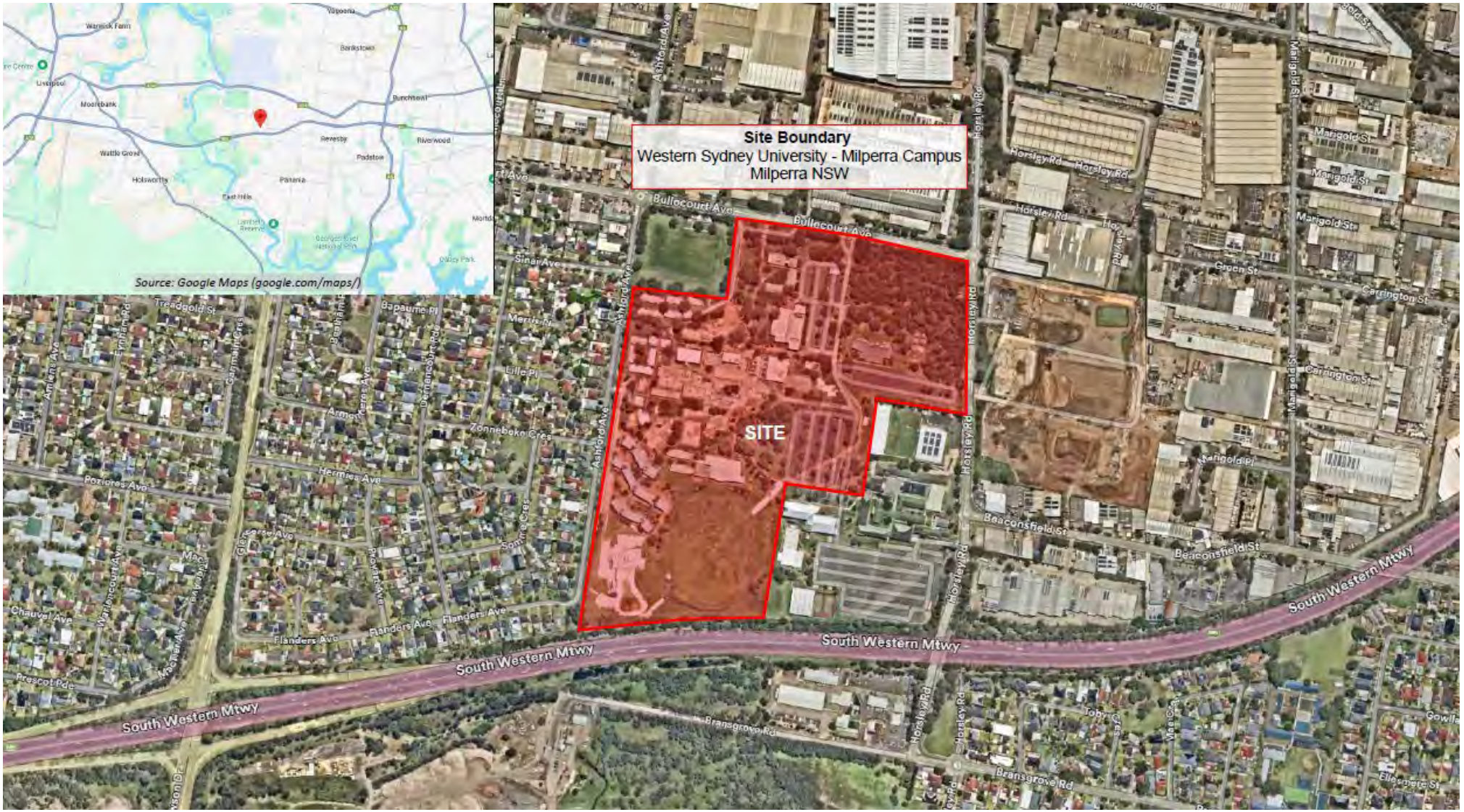


Figure 1-2 Proposed Layout and Staging of Residential Subdivision (Source: Ref [52])



Stage No.	No. of Superiots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	2	22	0	8435
Stage 2	4	42	0	20526
Stage 3A & 3B	1	0	1	35658
Stage 4	8	107	2	44398
Stage 5	6	63	0	20734
Stage 6	9	92	1	35400
Stage 7	6	59	0	22247

KEY NOTES

THE DEVELOPMENT WILL BE CONSTRUCTED AND DELIVERED IN 7 DISTINCT STAGES, HOWEVER, THE SEQUENCING OF THESE STAGES IS IMMATERIAL AS THE STAGING IS INTENDED TO BE INTERCHANGEABLE, DUE TO VARYING CONSTRUCTION TIMEFRAMES AND POTENTIAL OBSTACLES ENCOUNTERED WHILST ON SITE. STAGING SEQUENCING WILL BE AS PER THE FOLLOWING:

1. STAGE 1 IS INTENDED TO COMMENCE FIRST.
2. STAGES 2 OR 3A WILL COMMENCE SECOND AND BE DELIVERED PRIOR, CONCURRENTLY OR AFTER EACH OTHER. FOR EXAMPLE, STAGE 3A CAN COMMENCE PRIOR, CONCURRENTLY OR AFTER STAGE 2 AS THEY ARE INDEPENDENT.
3. STAGE 3B CANNOT OCCUR PRIOR TO STAGE 3A, BUT DOES NOT HAVE TO BE DELIVERED BEFORE STAGES 2, 4, 5, 6 AND STAGE 7.
4. STAGE 4 CANNOT BE DELIVERED PRIOR TO STAGE 2, BUT CAN BE DELIVERED PRIOR TO STAGE 3A.
5. STAGE 5 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A AND STAGE 4.
6. STAGE 6 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A, 4 AND STAGE 5.
7. STAGE 7 CANNOT BE DELIVERED PRIOR TO STAGE 2, 4 AND STAGE 6.

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works.
DIAL 1100 BEFORE YOU DIG

PRELIMINARY PRINT
NOT FOR CONSTRUCTION

Figure 1-3 Location of Properties within 200m of Site Notified to the EPA as Potentially Contaminated (Source: Goggle map])



Figure 1-4 Location of Kelso Landfill Relative to Site (Source: Goggle map])



1.2 Proposed Development

The environmental consultant EGA[3] advised that the proposed development consisted of the construction of residential housing and associated infrastructure within a low-density residential land use setting. The Site would be subdivided into up to 430 residential lots, a 2 ha of conservation land in the NE corner of Site and three open space areas / public parks. Residential lots would be sold under Torrens tittle. Road corridors and parkland areas would be acquired by council and the conservation area maintained through a community title scheme applicable to both E1 and C2 areas.

The proposed timeframe for the development is summarised in **Table 1-1**.

Table 1-1 Proposed Development Stages (Source: Table 1.2.1, Ref [12])

Development Stage	Residential lots	Parks/ Conservation Area	Construction Timeframe
1	22	No	Q3 2026 to Q4 2026
2	40	Central park	Q3 2026 to Q1 2027
3	0	C2 Conservation Area	Q2 2027 to Q3 2027
4	107	Southern Park	Q2 2027 to Q2 2028
5	65	No	Q2 2028 to Q4 2028
6	92	Northern park	Q3 2028 to Q1 2029
7	59	No	Q1 2029 to Q3 2029

The proposed bulk earthworks plan for the development consists of 55,502 m^3 of cut and 60,584 m^3 of fill, with an extract of the earthworks cut-to-fill plan provided in **Figure 1-5**.

1.3 Audit Purpose, Audit Scope and Report Structure

1.3.1 Purpose

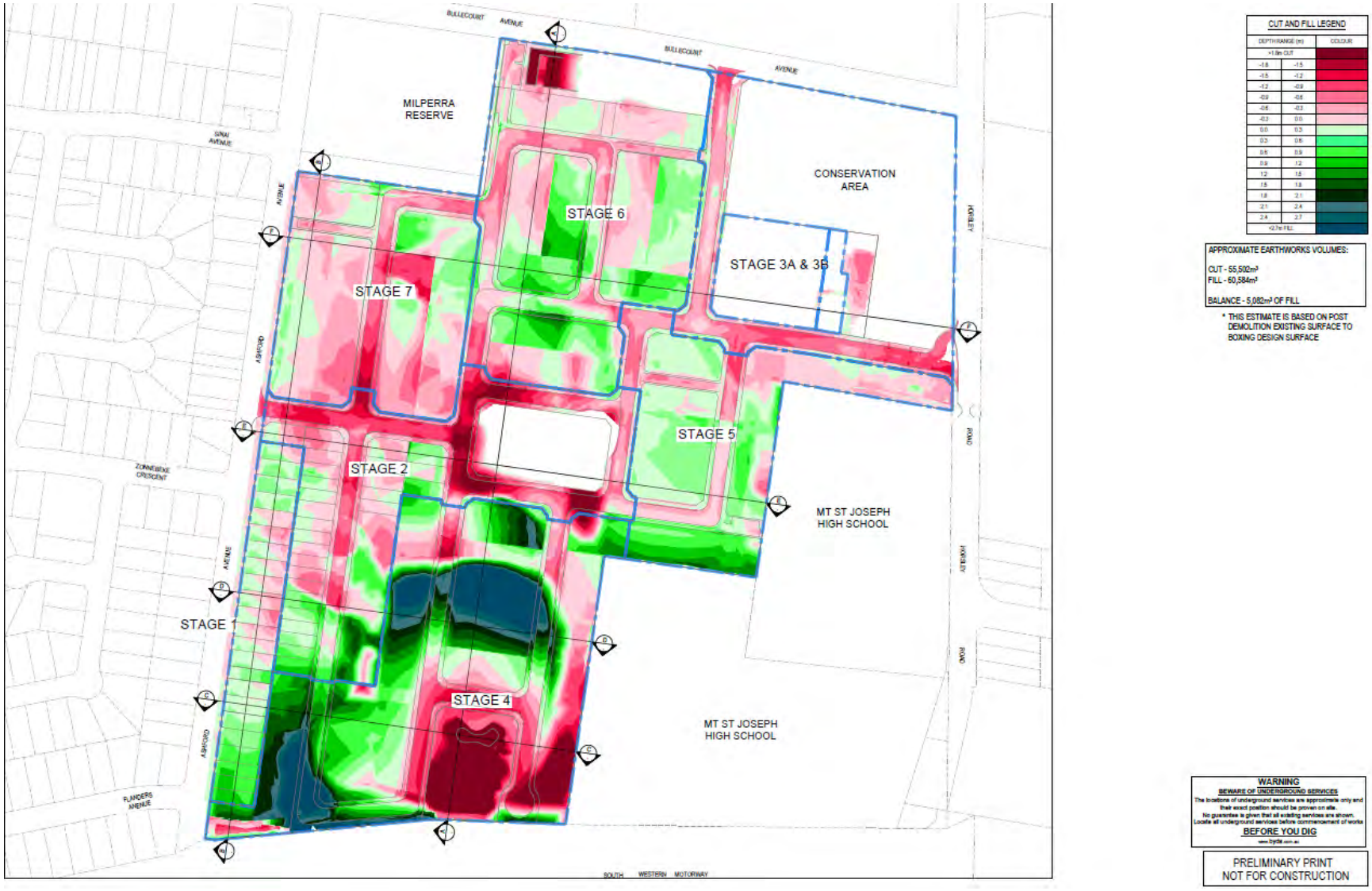
The audit was conducted for the purpose of determining whether:

- The nature and extent of the contamination has been appropriately determined;
- The investigation, remediation or management plan is appropriate for its stated purpose;
- The Site can be made suitable for low-density residential land use (i.e. Residential A) as approved by a Development Consent;
- To support the Department of Planning, Housing and Infrastructure (**DPHI**) and Council's decision making propose concerning the granting of a Development Consent for the proposed development; and
- To issue a Section B SAS certifying the appropriateness of a RAP for remediating contamination and validating the final condition of the Site.

The audit work conducted for this SAR also reviewed documentation generated on demolition work conducted at the Site between 2024 and 2025 under Development Consent DA-1512/2023 issued by Council dated 31/05/24 (Ref [53]). This documentation consisted of a demolition clearance report prepared by EGA dated 15 October 2025 (Ref [10]).

[3] Section 1.2, Ref [12]

Figure 1-5 Cut-to-Fill Bulk Earthworks Plan for Proposed Residential Development (Source: Appn A, Ref [12])



1.3.2 Audit Scope

The scope of work undertaken for the preparation of this SAR comprised the following tasks:

- Reviewed environmental site assessment (**ESA**) reports and Remediation Action Plans (**RAPs**) prepared for the Site;
- Inspected the Site prior to, during and after demolition work;
- Reviewed a demolition clearance report;
- Prepared interim audit advices; and
- Prepared this SAR and a Section B SAS for the Site.

1.3.3 Report Structure

The structure of this SAR has been divided into five sections that reflect the scope of work completed for this report:

- Section 1: Introduction
- Section 2: Review of ESAs and the assessment of contamination risks at the Site;
- Section 3: Review a demolition clearance report;
- Section 4: Review of RAPs and the preferred remediation strategy for the Site;
- Section 5: Conclusions; and
- Section 6: Other relevant information.

1.4 Standards

1.4.1 EPA Approved Guidelines

The site audit was undertaken in accordance with the provisions of the CLM Act and EPA requirements as specified in their endorsed documents, as listed on the EPA website[4]. Waste materials removed from the Site needed to be assessed in accordance with the latest EPA waste guidelines.

1.4.2 Council's Contaminated Land Policy

The site audit was also undertaken in accordance with the provisions of Council's 2017 Contaminated Land Policy (Ref [55]), which was consistent with the State Environment Planning Policy 2021 Resilience and Hazards (**R&H SEPP**) and EPA guidance.

1.4.3 Decision Process for Sensitive Sites

The Site Auditor assessed the risks posed by ground contamination at the Site by following the *'Decision-making process for assessing urban redevelopment sites'* as given in Appendix A of the EPA (October 2017) '*Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme (3rd edition)'*, which involved ten issues.

[4] www.epa.nsw.gov.au/clm/guidelines.htm

The first issue in the EPA decision process was that:

'all site assessment, remediation and validation reports follow applicable guidelines'.

The Data Quality Indicators (**DQI's**) and assessment criteria that the Site Auditor set for the environmental assessments conducted at the Site are summarised in **Table 1-2**. These DQI's and criteria were set by the Site Auditor in order to assess the reliability and adequacy of the data provided by the Environmental Consultants. The DQI's were used by the Site Auditor to identify any areas in the documentation where the level of non-compliance was considered to be significant.

Table 1-2 Data Quality Objectives and Evaluation Criteria

DQI	Evaluation Criteria
Documentation completeness	• DQO process properly described • Site properly identified • Site history adequately known • The conceptual site contamination model for the site is known to a high level of confidence • The condition of the site and surrounding areas are adequately known • Completion of field calibration records, borehole logs, chain of custody documentation, laboratory test certificates from NATA-registered laboratories
Data completeness	• Sampling density comparison meets EPA (2022) *'Sampling Design Guidelines'* for all potential contaminants of concern at all areas of environmental concern (**AECs**) • Use of systematic and judgemental sampling to provide sufficient data representative of all AECs
Data comparability	• Use of appropriate techniques for the sampling, storage and transportation of samples • Use of NATA certified laboratory using NEPM procedures
Data representativeness	• Good sampling coverage of all AECs at the site, and selection of representative samples • Location, distribution & extent of samples appropriate to characterise contamination at all AECs
Precision and accuracy for sampling and analysis	• Use properly trained and qualified field personnel • Blind field duplicates to be collected at a minimum rate of 1 in 10 • RPD's to be less than 30% for inorganic and 50% for organic analyses • Acceptable levels for equipment rinsate blanks • Achieve laboratory QC criteria

The remaining issues in the EPA decision process were:

- *'any aesthetic issues relating to site soils have been adequately addressed;*
- *soils have been assessed against relevant health-based investigation levels and potential for migration of contamination from soils to groundwater has been considered;*
- *groundwater (where relevant) has been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered;*
- *hazardous ground gases (where relevant) have been assessed against relevant health-based investigation levels and screening values;*
- *any issues relating to local area background soil concentrations that exceed relevant investigation levels have been adequately addressed in the site assessment report(s);*
- *the impacts of chemical mixtures have been assessed;*
- *any potential ecological risks have been assessed;*
- *any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier; and*
- *the site management strategy (where relevant) is appropriate including post-remediation environmental plans.'*

The Site Auditor applied this 10-step decision process to the review of the ESAs and RAP prepared for the Site.

1.5 Audited Documentation

ESAs have been conducted at the Site since 2011 by several environmental consultants comprising Coffey Geotechnics ('**Coffey**'), Noel Arnold & Associates (NAA), JBS&G, Alliance Geotechnical ('**Alliance**'), Sydney Environmental Group (**SEG**) and EGA. An earlier Section B SAS / SAR was issued in 2022 by another site auditor prior to the commencement of demolition work. The review work done by the earlier site audit has not been relied upon for this site audit, with the documentation available to the earlier site audit also being reviewed and assessed as part of this site audit.

The environmental reports reviewed for this SAR comprised:

1. Coffey Geotechnics (25 August 2011) '*Phase 2 Environmental Site Assessment, Student Residence Development, University of Western Sydney, Bankstown Campus".* Document No: GEOTLCOV24163AD-AB prepared for The University of Western Sydney
2. Noel Arnold & Associates (October 2011) '*Soil Contamination Investigation, University of Western Sydney – Bankstown Campus, Bullecourt Avenue, Milperra NSW*'. Document SJ0085:95458 prepared for JDH Architects
3. JBS&G (7 February 2018) '*Phase 1 Environmental Assessment Report, Bullecourt Ave, Milperra NSW*'. Document No: 54086-110124 (Rev 1) prepared for the Western Sydney University

4. Alliance Geotechnical Pty Ltd (30 January 2020) '*Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214, Lot 103 DP874035'*. Document No. 9996-ER-1-1 prepared for Mirvac
5. Alliance Geotechnical Pty Ltd (15 September 2022) 'Remedial Action Plan, Western Sydney University – Milperra Campus, Horsely Rd & Bullecourt Ave, Milperra, NSW 2214'. Document No. 9996-ER-2-1_Rev03 prepared for Mirvac
6. Walkden L (27 September 2022) 'Site Audit Report, Remediation Action Plan, Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra'. Audit No: LW-030 prepared for Mirvac
7. Walkden L (27 September 2022) Section B Site Audit Statement for Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra. Audit No: LW-030 prepared for Mirvac
8. Sydney Environmental Group (22 February 2024) '*Supplementary Stage 2 Detailed Site Investigation, Western Sydney University, Milperra Campus, Milperra NSW*'. Document No: 2300-DSI-01-220224.v1f prepared for Mirvac Homes (NSW) Pty Ltd
9. Sydney Environmental Group (27 February 2024) '*Hazardous Building Materials Survey Report, Western Sydney University – Bankstown Campus, Milperra NSW*'. Document 2300-HBMS-071123.v2f prepared for Mirvac Pty Ltd
10. EGA (15 October 2025) '*Demolition Clearance Report – 2 Bullecourt Avenue, Milperra NSW*'. Document No: 2300-LTR-01-160725.v2f prepared for Mirvac
11. EGA (8 October 2025) '*Phase 2 Assessment – Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'. Document No: 2300-DSI-01-110325.v6f prepared for Mirvac Residential (NSW) Developments Pty Ltd
12. EGA (24 October 2025) '*Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'. Document No: 2300-RAP-01-300924.v41f prepared for Mirvac Residential (NSW) Developments Pty Ltd

Other information reviewed for this SAR comprised:

50. City of Canterbury-Bankstown (2018) *'Deepwater Park and Kelso Parklands Plan of Management*'. Draft (https://www.cbcity.nsw.gov.au/planning-and-building/councils-strategies-and-masterplans/deepwater-park-and-kelso-parklands-plan-management)
51. Beveridge Williams (31 May 2024) Council DA Stamped Drawings '*WSU Milperra, Demolition DA, 2 Bullecourt Avenue, Milperra*'. Project number 2301879, Rev B, 22 sheets. Prepared for Mirvac
52. Beveridge Williams (24 July 2025) Drawing '*Master Staging Plan, WSU Milperra 2 Bullecourt Ave, Milperra, Canterbury-Bankstown Council*'. Drawing No. 2301879 302 010N prepared for Mirvac
53. City of Canterbury-Bankstown (31 May 2024) "*Notice of Determination of a Development Application, Application Number DA-1512/2023, Demolition of selected buildings and structures in four stages*". 19 pages
54. Beveridge Williams (28 August 2025) Bulk Earthworks Drawings for *"WSU Milperra, Lot 1 in DP101147 and Lot 2 in DP1291984, 2A Bullecourt Avenue, Milperra*". Dwg Nos: 2301879 320 070 C to 2301879 320 074 C

55. City of Canterbury Bankstown (22 August 2017) "*Contaminated Land Policy*"

The Site Auditor was aware of two other ESAs that had been undertaken at the Site, which were unavailable for review. These comprised:

- A geotechnical investigation undertaken by Coffey Geotechnics in 2011 for the childcare centre located in the NE corner of the Site prior to its construction. The absence of this report was not considered significant because of its minor nature and because the investigation data was included in the NAA 2011 report (Ref [2]) and reviewed as part of this SAR; and
- An investigation conducted by Environmental Investigation Services (**EIS**) at sporting fields in the SW corner of the Site, as reported by the JBS&G 2018 PSI. The absence of this report was not considered significant because the investigation only involved three boreholes and because of the significant amount of other investigation work documented in reports that have been reviewed for this SAR.

The Site Auditor was unaware of the existence of any other relevant documents that provided information on site conditions. Additional information was obtained by the Site Auditor when site inspections were conducted on:

- 21/10/24 prior to demolition;
- 6/02/25 during demolition work; and
- 27/10/25 following the completion of remediation work.

Photos of the Site taken by the Site Auditor during these inspections are provided in **Appendix D**.

1.6 Chronology of the Site Audit Program

The chronology of the site audit program undertaken for the Site consisted of the following events:

- 9 August 2024 – The Site Auditor was engaged by Mirvac to provide interim audit advice (numbered IAA #01)for early stage demolition work (**Appendix C**)
- 21 October 2024 – The Site Auditor inspected with Site prior to the commencement of demolition, with a copy of photos taken provided in **Appendix D**
- 31 October 2024 – The Site Auditor was appointed to undertake a statutory site audit and issued an audit notification to the EPA
- 21 January 2025 – The Site Auditor provided interim audit advice (numbered IAA #02) to Mirvac on contamination issues raised by Council in a letter dated 23 December 2024 (**Appendix C**)
- 6 February 2025 – The Site Auditor inspected the Site during demolition work, with a copy of photos taken provided in **Appendix D**
- 5 June 2025 – The Site Auditor provided interim audit advice (numbered IAA #03) to Mirvac on the classification of proposed remediation under the R&H SEPP (**Appendix C**)
- 25 September 2025 – The Site Auditor completed a review of all available ESAs and issued interim audit advice (numbered IAA #04) to Mirvac and EGA on revisions that needed to be made to the EGA 2025 DSI (**Appendix C**)

- 8 October 2025 - The Site Auditor provided interim audit advice (numbered IAA #05) to Mirvac and EGA concerning the practicality and possible cost of the remediation strategy documented in the EGA 2025 RAP (**Appendix C**)
- 9 October 2025 – The Site Auditor issued interim audit advice (numbered IAA #06) to Mirvac and EGA on an early version of the demolition clearance report (**Appendix C**)
- 15 October 2025 – The Site Auditor issued interim audit advice (numbered IAA #07) to Mirvac and EGA on an early version of the RAP (**Appendix C**)
- 30 October 2025 – The Site Auditor completed reviews of revised versions of the EGA 2025 ESA (Ref [11]), the Demolition Clearance Report (Ref [10]), and the EGA 2025 RAP (Ref [12]), completed a SAR and its associated Section B SAS on the preferred remediation strategy for Site, with a copy of the Section B SAS and 2025 RAP provided in **Appendix E**.

1.7 Abbreviations

ACM	Asbestos containing material
ADWG	Australian Drinking Water Guidelines
AEC	Area of Environmental Concern
AF	Asbestos fines
AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
ASS	Acid sulfate soil
ASSMAC	NSW Acid Sulfate Soils Management Advisory Committee
ATSDR	Agency for Toxic Substances and Disease Registry (USA)
B&D waste	Building and demolition waste
BaP	Benzo(a)pyrene
bgl	Below ground level
BTEX	Benzene, toluene, ethyl benzene, xylenes
CCA	Copper chrome arsenate
CoC	Chain of custody
COPC	Contaminant of potential concern
COV	Coefficient of variation
CRS	Chromium reducible sulfur
CSM	Conceptual site model
DCP	Development control plan
DEC	Department of Environment and Conservation NSW
DECC	Department of Environment and Climate Change NSW
DECCW	Department of Environment, Climate Change and Water NSW
DGI	Data gap investigation
DIPNR	Department of Infrastructure, Planning and Natural Resources
DNAPL	Dense non-aqueous phase liquid
DNPGU	Domestic Non-Potable Groundwater Use
DNR	Department of Natural Resources
DO	Dissolved oxygen

DP	Deposited plan
DPHI	Department of Planning, Housing and Infrastructure
DQI	Data quality indicator
DQO	Data quality objective
DSI	Detailed site investigation
EC	Electrical conductivity
EIL	Ecological investigation level
EIS	Environmental Investigation Services
EMP	Environmental management plan
ENM	Excavated natural material
EPA	Environment Protection Authority (NSW)
EPL	Environment Protection Licence
ESA	Environmental site assessment
ESD	Ecologically sustainable development
FA	Friable asbestos
GIL	Groundwater investigation level
GITA	Geotechnical inspection and testing authority
GPR	Ground penetrating radar
GPS	Global positioning system
GSW	General solid waste
HAZMAT	Hazardous (building) material assessment
HDPE	High density polyethylene
HF	High frequency
HIL	Health investigation level
IER	Initial environmental review
INCHEM	International Programme on Chemical Safety, World Health Organisation
ISQG	Interim Sediment Quality Guidelines
kg	Kilograms
L	Litres
LAA	Licensed asbestos assessor
LEC	Land and Environment Court of NSW
LF	Low frequency
LFG	Landfill gas
LGA	Local Government Area
LNAPL	Light non-aqueous phase liquid
LTEMP	Long term environmental management plan
m	Metres
MAHs	Monocyclic aromatic hydrocarbons
mg	Milligrams
MOU	Memorandum of understanding
MPN	MPN = Most probable number

MTP	Materials tracking plan
NAA	Noel Arnold & Associates
NE	North-east
NEHF	National Environment Health Forum
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NMOC	Non-methane organic compounds
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
NW	North-west
OCP	Organochlorine pesticides
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential ASS
PCBs	Polychlorinated Biphenyls
PID	Photoionisation detector
PPE	Personal Protective Equipment
ppm	parts per million
PSI	Preliminary site investigation
RAP	Remediation Action Plan
R&H SEPP	Resilience and Hazards SEPP
RL	Reduced level
RSL	Regional Screening Level (US EPA)
SAC	Soil acceptance criteria
SAQP	Sampling analysis and quality plan
SAR	Site audit report
SAS	Site audit statement
SCW	Scheduled Chemical Waste
SD	Standard deviation
SE	South-east
SEG	Sydney Environmental Group
SEPP	State environment planning policy
SIL	Soil investigation level
SMF	Synthetic mineral fibre
SMP	Site Management Plan
SOMC	Standard optimum moisture content
SPD	Stoneware pipe drain
SRVR	Site remediation and validation report
SVOCs	Semi volatile organic compounds
SW	South-west
SWMP	Soil and water management plan
SWMS	Site work method statement
TCLP	Toxicity Characteristic Leaching Procedure

TDS	Total dissolved solids
TPH	Total petroleum hydrocarbons
TRH	Total Recoverable hydrocarbons
UCL	Upper confidence limit
US EPA	United States Environmental Protection Agency
VENM	Virgin excavated natural material
VHCs	Volatile halogenated compounds
VOCs	Volatile organic compounds
WCR	Waste classification report
WH&S	Work health and safety

2. Review of ESAs and Contamination Risks

*This section of the SAR provides a review of the adequacy of ESAs prepared for the Site and assesses the reports in terms of their compliance with EPA reporting requirements. The SAR first reviews those reports relevant to the development of a Conceptual Site Model (**CSM**) for contamination at the Site. The SAR then reviews those reports that provided data relevant to an assessment of contamination risks at the Site and how these contamination risks should be addressed.*

2.1 DQO Process

The Site Auditor assessed the appropriateness of the ESA's using the following data quality objective (**DQO**) process, which was considered to meet EPA requirements:

- **Step 1: State the Problem** – Potential contamination at the Site may affect its use for the proposed development. There was also the potential for off-site migration of contamination.
- **Step 2: Identify the Decisions** – These included:
  - To assess the likelihood and / or extent of significant soil contamination which may have resulted from past activities at the Site
  - Identify contamination which may be occurring at the Site and non-compliance with environmental regulations
  - Recommend management strategies which may be required at the Site, including additional investigations and/or remediation works.
- **Step 3: Identify Inputs to the Decisions** – These included:
  - Existing site information, site history, regional geology, topography and hydrogeology
  - The use of proper investigation techniques
  - Development of a CSM for contamination
  - The use of appropriate site assessment criteria and compare results as measured against these criteria
- **Step 4: Define the Study Boundaries** – The property boundaries and the legal property definitions.
- **Step 5: Develop a Decision Rule** – The decision rules in characterising contamination at the Site were:
  - Laboratory test results were to be measured against EPA-approved criteria
  - The Site would be deemed not contaminated if soil, soil vapour and groundwater concentrations were within background levels, QA/QC data demonstrate acceptable reliability and representativeness, results generally meet regulatory criteria, results were from NATA accredited laboratories, detection limits were below assessment criteria and the results could be shown to be of minimal concern
- **Step 6: Specify Limits on Decision Errors** – These included:
  - The acceptable limits for inter/intra laboratory duplicate sample comparisons were laid out within the fieldwork protocols

- The acceptable limits for laboratory QA/QC parameters were based upon the laboratory reported acceptable limits and those stated within the NEPM 2013 guidelines.

➢ **Step 7: Optimise the Design for Obtaining Data** – Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs. This may involve the use of field screening tests and use of biased sampling.

A summary of the DQI's for field & laboratory test programs are specified in **Table 1-1**.

2.2 Site Location Details

The site location data provided in the available ESAs for the Estate is summarised in **Table 2-1**.

Table 2-1: Summary of Site Location Details

Site Location Detail	Detail	References
Site name	Former Western Sydney University Milperra Campus	Sectn 1.1, Ref [11]; Sectn 1.1, Ref [12]
Address/location	Bullecourt Avenue, Milperra	Section 2, Ref [11]; Section 2, Ref [12]
Legal property description & areas	Lot 1 DP101147 and Lot 2 DP1291984	Section 2, Ref [11]; Section 2, Ref [12]
Site area	19.64 ha	Section 2, Ref [11]; Section 2, Ref [12]; Ref [52]
Owner	NSW Government	Section 1, Ref [3]; Section 1.1, Ref [4]
Developer	Mirvac	Section 1.1, Ref [11]; Section 1.1, Ref [12]
LGA	City of Canterbury-Bankstown	Section 2, Ref [11]; Section 2, Ref [12]
Past Zoning	Rural - residential	Sectn 2, 3.1 & Appn C, Ref [3]; Sectn 4.1 & Appn D, Ref [11]
Current zoning)	R1 – General residential, RE1 – Public recreation, C2 – Environmental Conservation, E1 – Local Centre	Section 2, Ref [11]; Section 2, Ref [12]; Canterbury-Bankstown LEP 2023
Future zoning	No known changes	Section 2, Ref [12]
Surrounding land use	North – Bullecourt Ave then commercial/ industrial including a service station to NW East – Mount Saint Joseph's High School, Horsley Rd then commercial/industrial South – M5 Motorway then Kelso Landfill West – Ashford Ave then residential	Section 2.2, Ref [3]; Section 3.6, Ref [4]

Legend:

Inadequate information provided in investigation reports

An extract of the current zoning plan for the Site is provided in **Figure 2-1**, an extract of a topographic survey plan of the Site from a 2020 report provided in **Figure 2-2**, with a subdivision plan provided in **Figure 2-3**.

The Site Auditor assessed the accuracy of the site location information provided in the reports by:

- Identifying data gaps based on EPA reporting requirements;
- Comparing the multiple lines of evidence provided by the source data;
- Reviewing publicly available data provided by Six Maps website, Google aerial views and maps from the Canterbury-Bankstown Local Environmental Plan 2023; and
- Inspecting the Site prior to and during demolition work, with a copy of photos taken provided in **Appendix D**.

The Site Auditor considered the information provided by the ESAs met the documentation completeness DQO.

Figure 2-1 Current Zoning Plan for Site (Source: Canterbury-Bankstown LEP 2023)

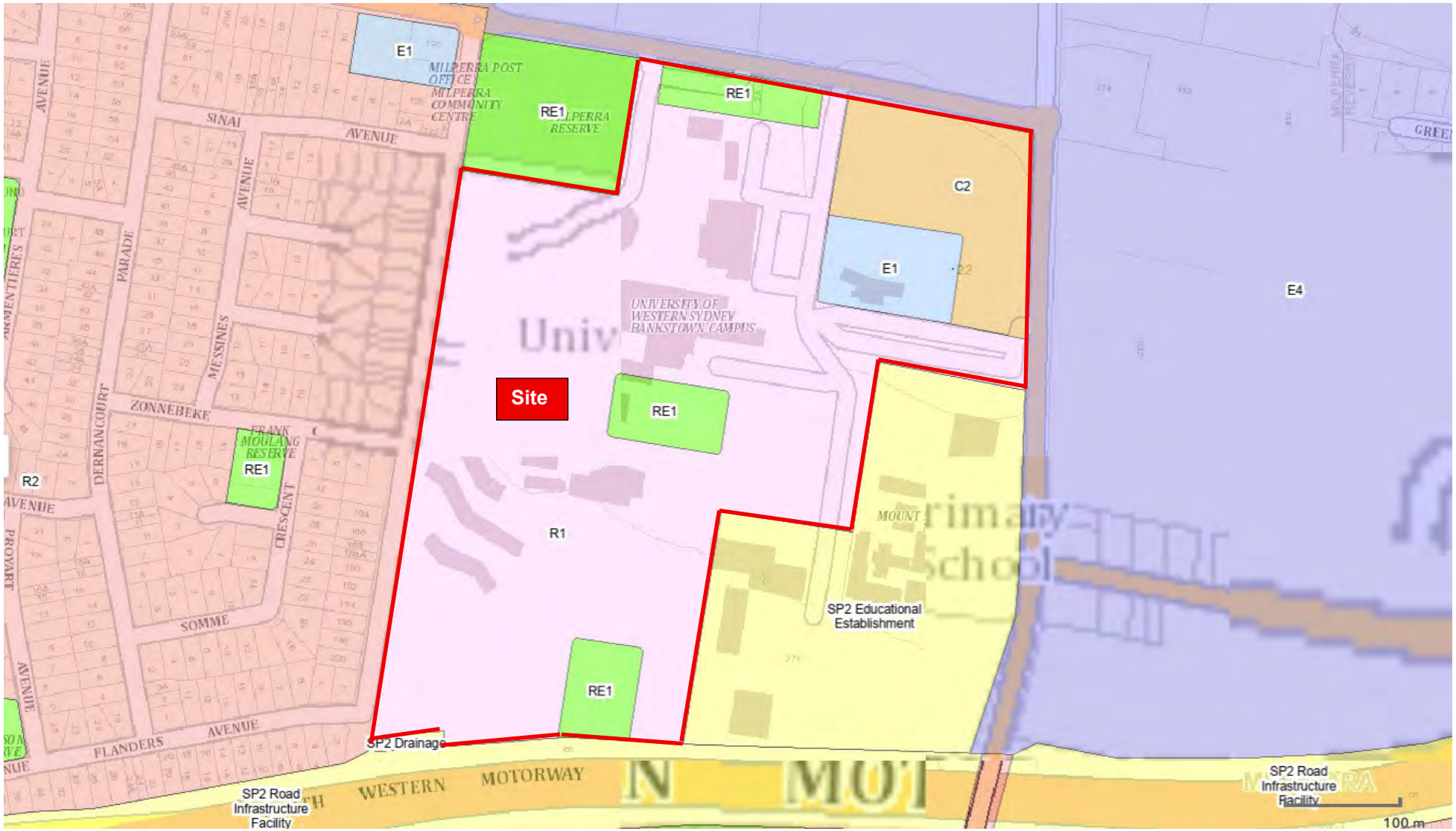


Figure 2-2 Survey Plan of Site (Source: Appn B, Ref [4])

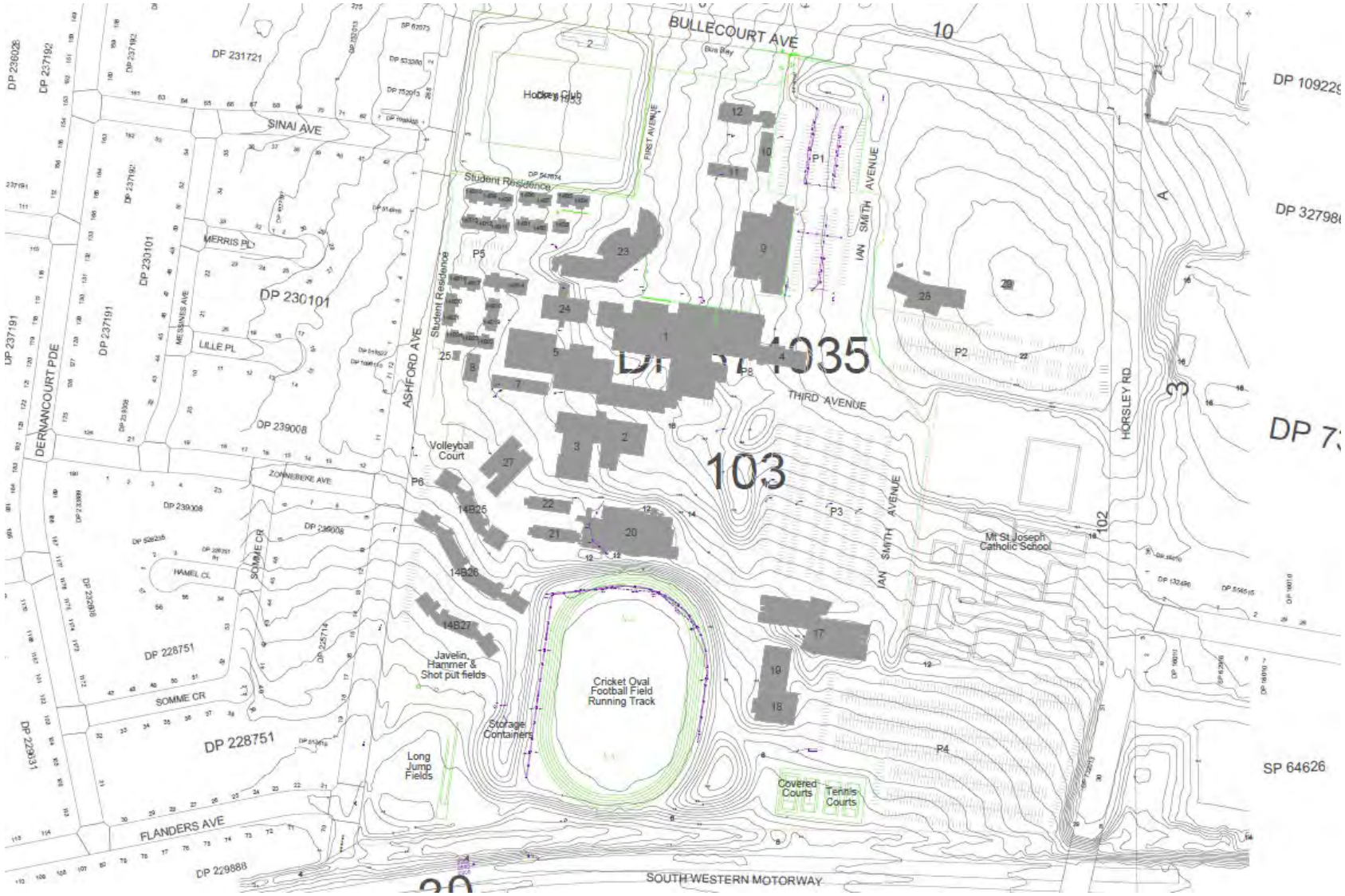
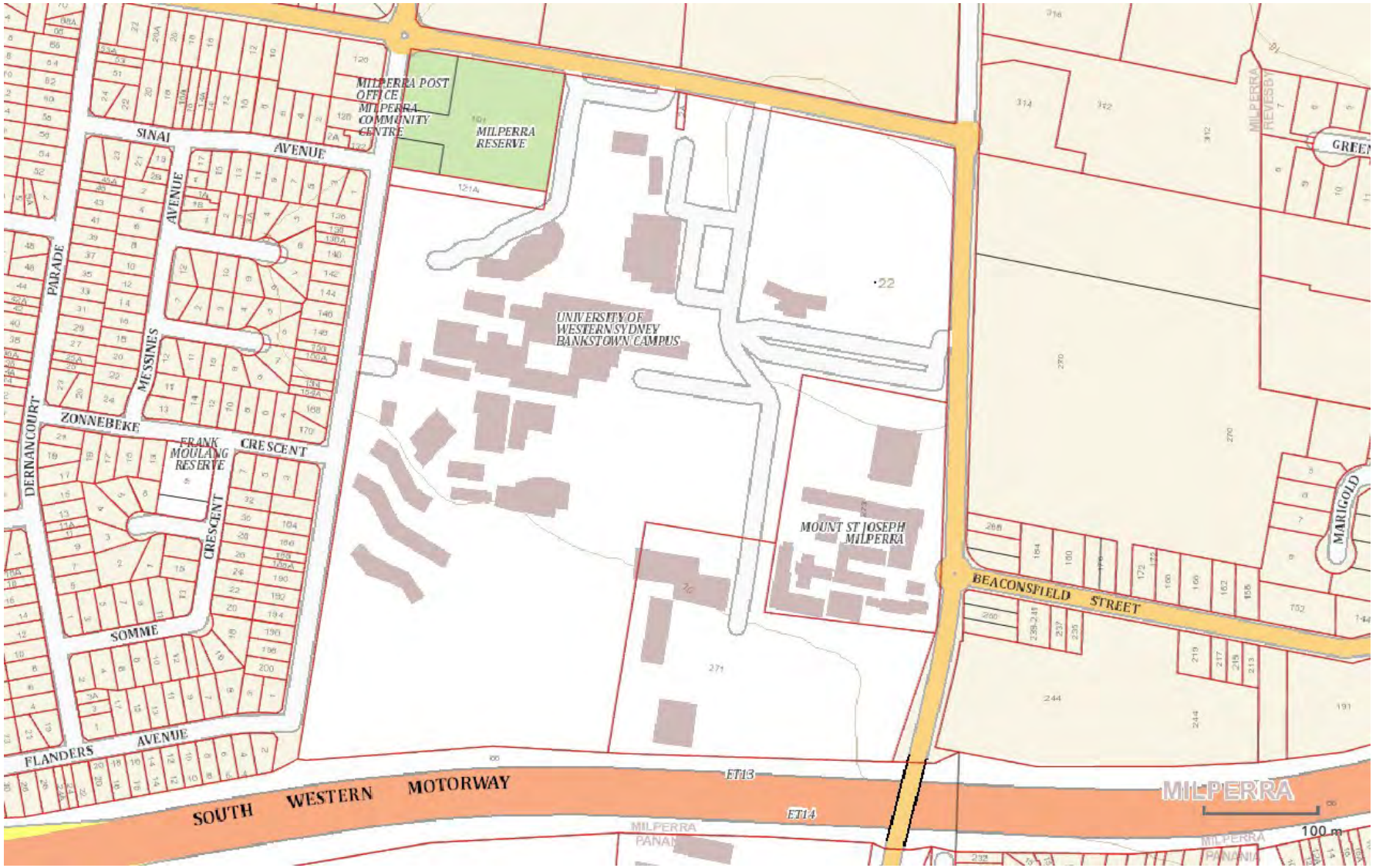


Figure 2-3 Canterbury - Bankstown LEP 2023 Subdivision Plan (Source: Council website)



2.3 Site History Details

2.3.1 Data Quality Assessment

The historical data provided by the ESAs for the Site is summarised in **Table 2-2**.

Table 2-2: Summary of Site History Details

Site History Detail	References
Property zoning and land use changes	Sectn 3.1 & Appn C, Ref [3]; Sectn 4.1 & Appn D, Ref [11]
Property title search	Sectn 3.3, Ref [3]
Review of aerial photographs (1930, 1943, 1947, 1955, 1965, 1971, 1975, 1978, 1984, 1986, 1991, 1994, 1998, 2004, 2009, 2011, 2012, 2014, 2017, 2018, 2024)	Sectn 3.1 & Appn C, Ref [3]; Sectn 4.1 & Appn D, Ref [11]
Review of site photographs	Appn A, Ref [3]
Data provided by former owners / tenants / local Council	Sectns 3.4, 3.7 & Appn F, Ref [3]
Inventory of chemicals and wastes associated with site use and their on-site storage location	Not relevant
Site layout plans	Figure 2, Ref [3]; Figure 2, Ref [4]
Sewer and service plans	**Not provided**
Extent of any filling or dumping at the site	**Not provided**
Descriptions of manufacturing processes	Not relevant
Details and locations of former underground storage tanks (USTs) and above ground storage tanks (ASTs)	Sectn 3.6 & Appn H, Ref [3]
Product spill and loss history	Not relevant
Discharges to land, water and air	Not relevant
Disposal locations	Not relevant
Relevant complaint history	Not relevant
Local site knowledge of residents and staff – both present and former	Not relevant
Summary of local literature about site (e.g. newspaper articles, information from historical societies)	**Not provided**
Details of building and related permits, licences, approval and trade waste agreements	Sectn 3.2 & Appn D, Ref [3]
Historical use of adjacent land	Sectn 3.1 & Appn C, Ref [3]; Sectn 4.1 & Appn D, Ref [11]
Local usage of ground/surface waters, and locations of bores/pumps	Section 2.7, Ref [3]
Possible contaminant sources & potential off-site effects	Section 2.2, Ref [3]
Integrity assessment	Section 3.9, Ref [3]

Legend:

Inadequate information provided in investigation reports

The Site Auditor assessed the accuracy of the historical data provided in the ESAs by:

- Identifying data gaps based on EPA reporting requirements;
- Comparing the multiple lines of evidence provided by the source data;
- Reviewing publicly available data provided by Six Maps website (including the 1943 aerial photo), Google aerial views, the Council website, and maps from the Canterbury-Bankstown LEP 2023;
- Obtaining historical data from Google searches; and
- Inspecting the Site prior to and during demolition work, with a copy of photos taken provided in **Appendix D**.

The Site Auditor considered the historic land use assessments provided by the ESAs was close to meeting the documentation completeness DQO. However, the following data gaps were identified:

- The extent of fill at the Site;
- Historic Council records on their operation of the Kelso Landfill reportedly for over 75 years;
- Review of Environmental Protection Licence (**EPL**) 4606 held by Council for the Kelso Landfill;
- Buried services plans; and
- Local historic literature about the Site, including newspaper articles and information from historical societies.

The Site Auditor sought to address these data gaps by:

- Review the investigation data to assess the extent and type of fill at the Site (refer **Section 2.11**);
- Searching the Council website for information on the operation of the Kelso Landfill;
- Reviewing the EPA licence held by Council for the Kelso Landfill;
- Using additional historical data available from publicly available sources; and
- Using the null-hypothesis approach in assessing contamination risks, which meant that a contamination risk was assumed to exist unless sufficient evidence indicated that such a risk was unlikely to exist.

2.3.2 Review of Historic Aerial Photos

Reviews of historic aerial photos were provided by the JBS&G (2018) PSI and the EGA (2025) post-demolition DSI. These ESAs used historic aerial photos to identify potentially contaminating activities that may have occurred at the Site. These activities included:

- 1943 – 1965: Farming / agriculture: Potential for burial of agricultural wastes and spraying of pesticides / herbicides;
- 1965 - 1971: Demolition of farm buildings in the western part of the Site. Potential for burial of hazardous demolition waste;
- 1965 – present: The Kelso Swamp began to be filled in by waste as part of the Kelso Landfill operation undertaken by Council;

- 1965 – present: Industrial activities commenced and continued to the east / north of the Site;
- 1975 - 1986: Construction of educational buildings: Potential for hazardous building materials to have been used; and
- 1975 – 2014: Construction of educational buildings: Potential for contaminated fill to have been imported to the Site. A childcare facility was constructed in the SW corner of the NE conservation area sometime after the NAA (2011) ESA

The Site Auditor examined the historic aerial photos and considered the data supported the conclusions made by the ESAs. Copies of historic aerial photos showing these potential contaminating activities are provided in **Figures 2-4** to **2-8**.

The Site Auditor considered the data provided by the historical aerial photos indicated that activities at the Site posed contamination risks that needed to be considered by the conceptual site model (**CSM**) and assessed by the ESAs. These risks included:

- Surface soils impacted by herbicides / pesticides from past agricultural practices;
- Surface soils impacted by demolition waste and hazardous building materials;
- The burial of wastes from past agricultural practices and demolition work;
- Buried services that may contain asbestos and/or waste materials;
- Imported fill that may have been contaminated;
- Groundwater migrating across the northern / eastern sides of the Site impacted by surrounding industries; and
- Landfill gas (**LFG**) from the Kelso Landfill located to the south of the Site.

2.3.3 Review of Historic Land Titles

A review of historic land titles was provided by the JBS&G (2018) PSI. The PSI advised that:

- Most of the Site was used for market gardens and poultry farms before 1956 to 1979, after which the land was acquired by the NSW state government;
- The Minister for Education owned the Site from 1973 to 1984, which is consistent with the historic aerial photos showing construction of educational buildings commenced from 1975.

The Site Auditor examined the land title records and considered the data supported the conclusions made by the JBS&G (2018) PSI.

Figure 2-4 1930 Aerial Photo . (Source: Appn C, Ref [3])



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elyse.debrincat@mirvac.com
2018-06-28 03:36 GMT
IP: 202.139.54.21

Figure 2-5 1943 Aerial Photo . (Source: Appn C, Ref [3])

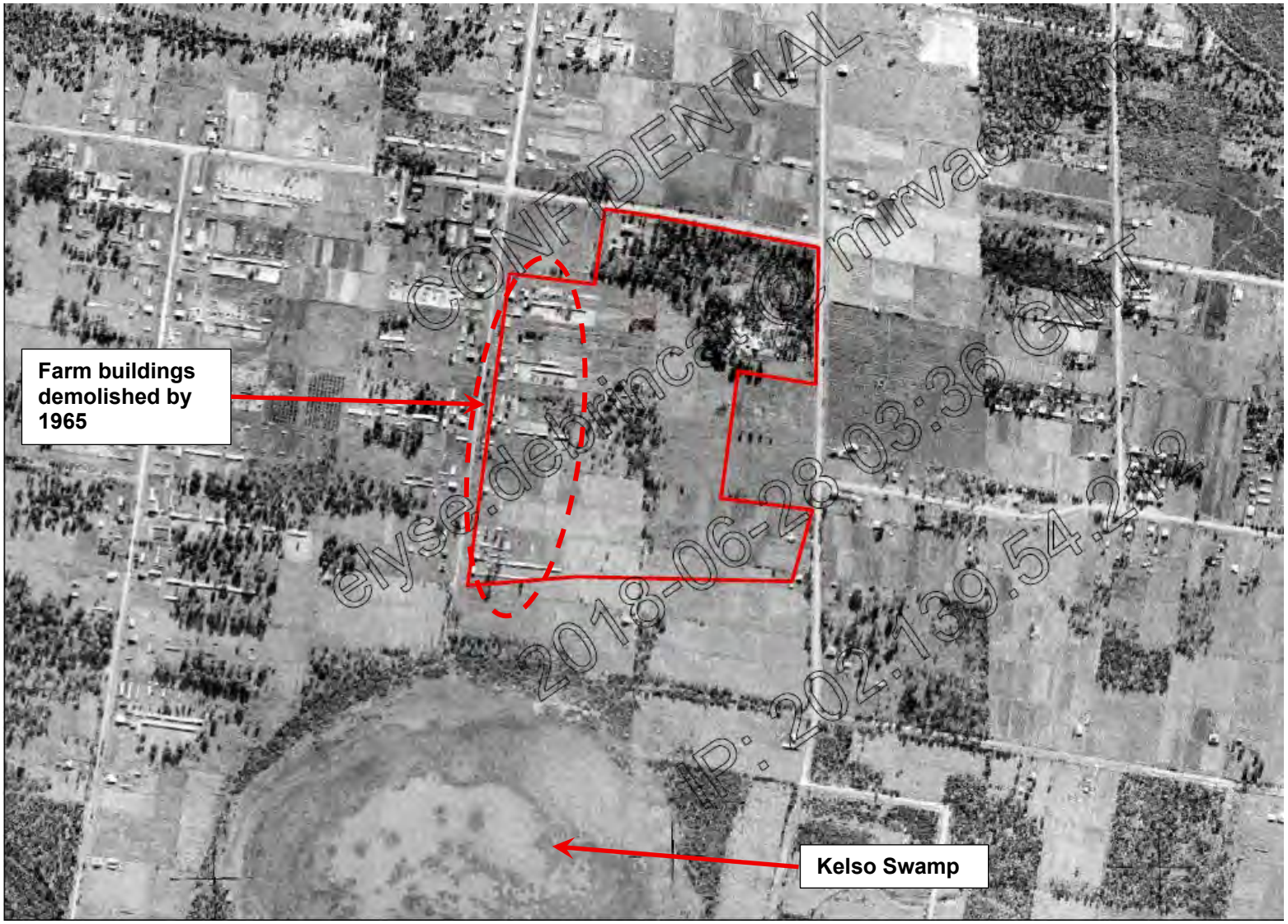
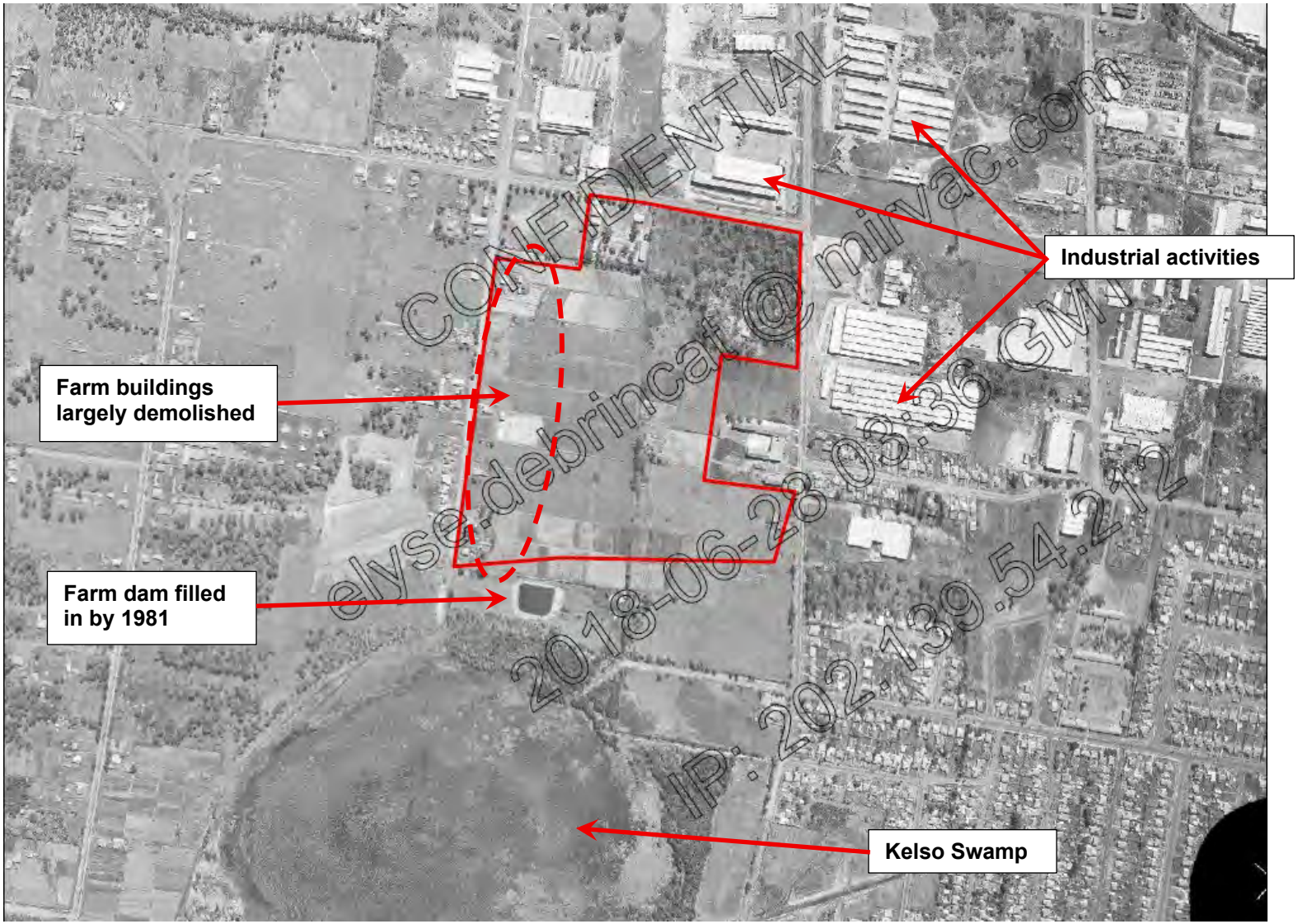


Figure 2-6 1965 Aerial Photo . (Source: Appn C, Ref [3])



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Figure 2-7 1975 Aerial Photo . (Source: Appn C, Ref [3])



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Figure 2-8 2017 Aerial Photo . (Source: Appn C, Ref [3])



2.3.4 Review of EPA Records

A review of EPA records was provided by the JBS&G (2018) PSI. The PSI advised that:

- The Site had no POEO matters on the EPA database;
- The Site had no CLM matters on the EPA database; and
- There were five properties in the Milperra area listed as having been notified to the EPA, with one of these located within 200 m of the Site. The EPA database listed this property at 286 Horsley Road, which is located adjacent to the Site on the eastern side of Horsley Road as shown in **Figure 1-3**. The EPA database recorded the property as being owned by Heatcraft Australia Pty Ltd, with regulation under the CLM Act not required.

The Site Auditor examined the EPA databases and considered the data considered by the JBS&G (2018) PSI supported the conclusions made. However, none of the ESAs identified the fact that the Kelso Landfill was still operating as a waste facility under EPL 4606, which allowed the waste facility to undertake non-thermal treatment of general waste and to dispose waste by application to land. The Site Auditor addressed this data gap by reviewing EPL 4606 in **Section 2.3.8**.

2.3.5 Review of Council Records

The JBS&G (2018) PSI reviewed two Section 149 certificates for the Site. The review advised that:

- The Site did not include critical habitat and was not within a conservation area; and
- No loose fill asbestos was recorded as being present at the Site.

The Site Auditor considered the search of Council records undertaken by the ESAs did not meet the documentation completeness DQO because no Council records were reviewed concerning the Kelso Landfill. The Site Auditor addressed this data gap by reviewing Council records on the Kelso Landfill available on the Council website and other historic sources, which is documented in **Section 2.3.8**.

2.3.6 Review of SafeWork NSW Records

The JBS&G (2018) PSI obtained SafeWork NSW search records for the Site. The SafeWork NSW data indicated that two USTs were removed in the central part of the Site on 19/12/1997. Each tank had a capacity of 2,500 L, with one tank used to store unleaded petrol and the other diesel. The locations of the tanks are shown in **Figures 2-8** and **2-9**.

The Site Auditor considered the contamination risks posed by the former USTs needed to be included in the CSM and assessed by the ESAs.

Figure 2-8 SafeWork NSW Record on Former UST Locations . (Source: Appn C, Ref [3])

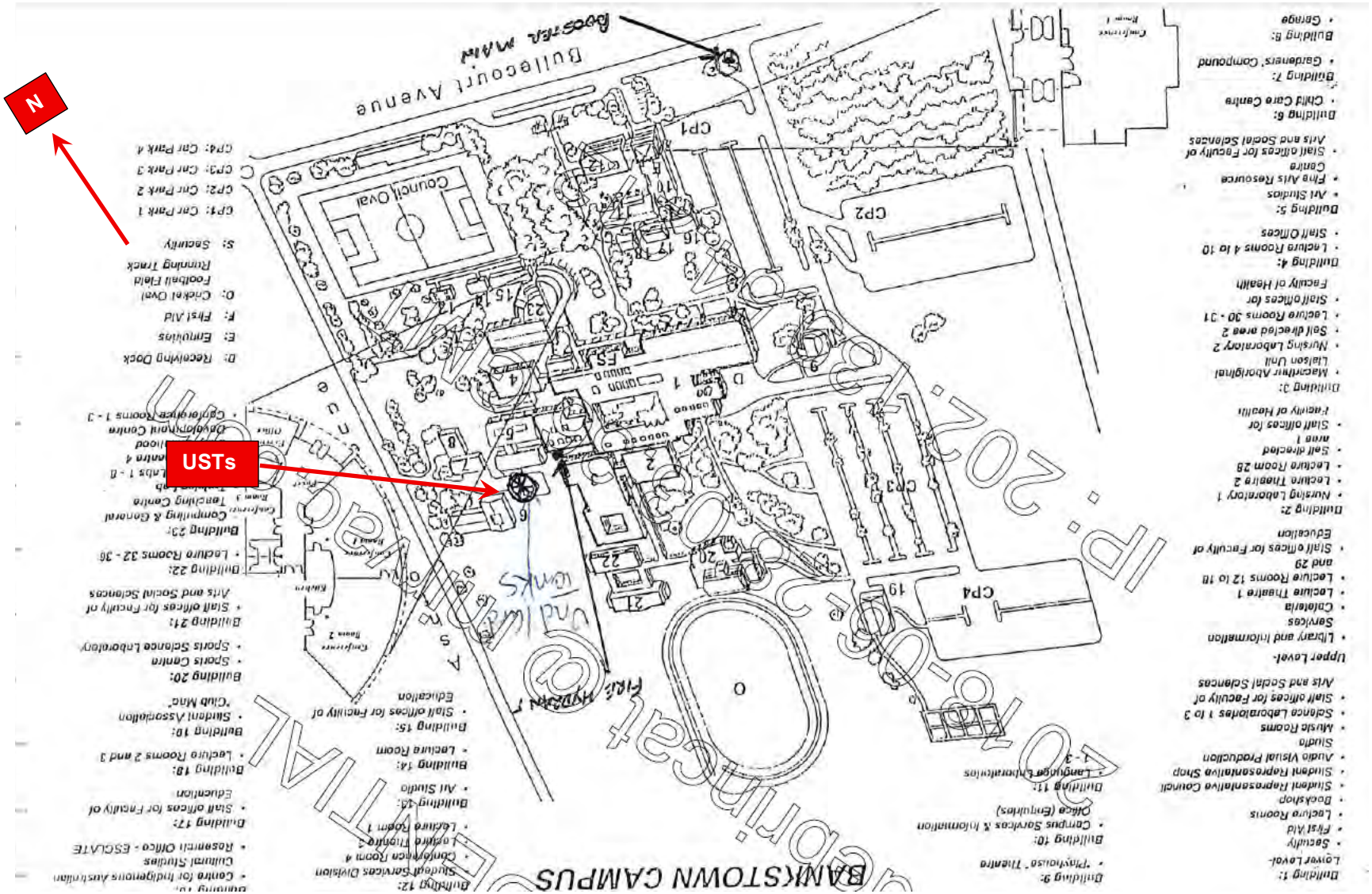
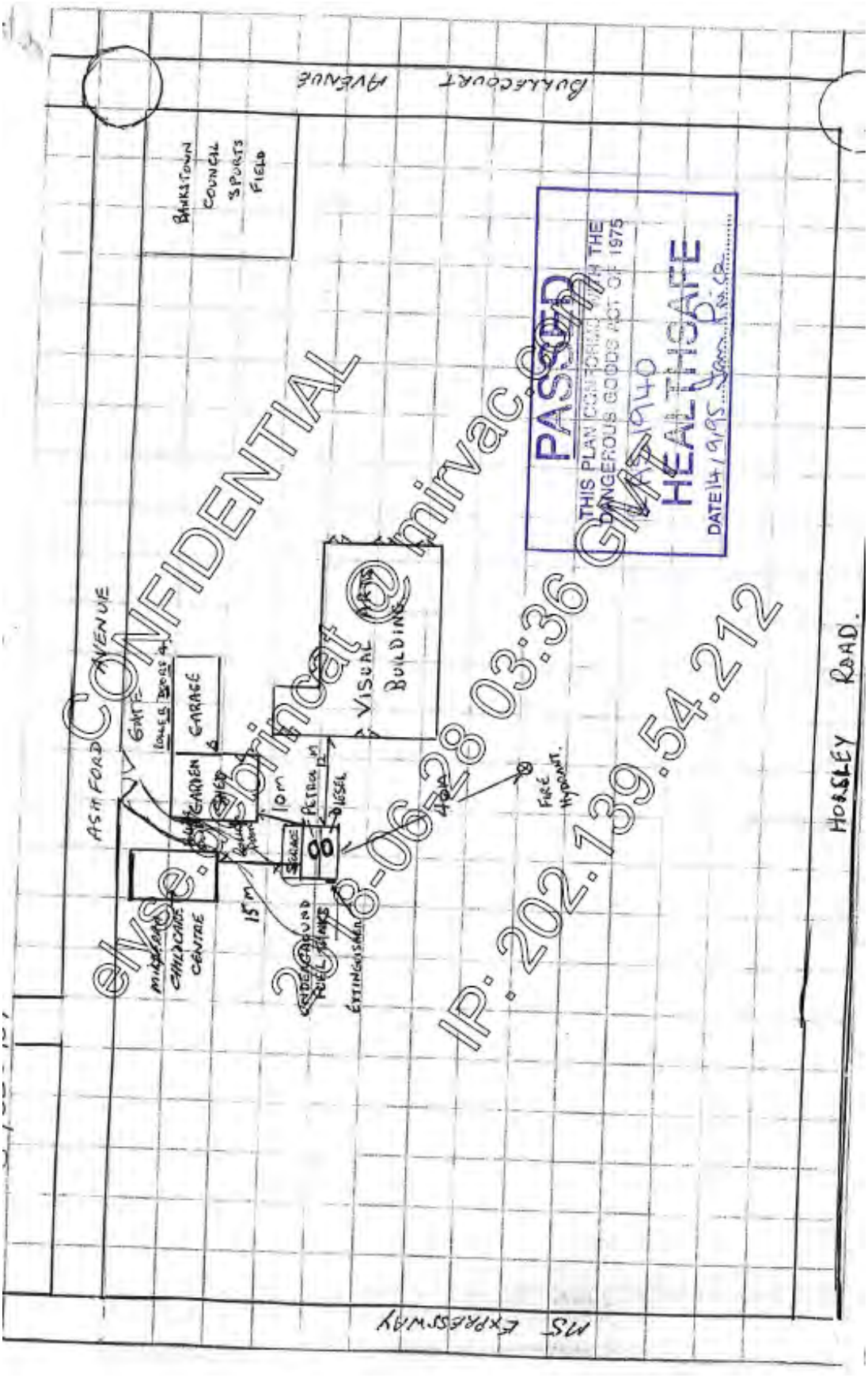


Figure 2-9 SafeWork NSW Record on Former UST Locations (Source: Appn C, Ref [3])



2.3.7 Potential Off-site Sources

The ESA considered there were potential off-site contamination sources that had the potential to pollute the Site. These comprised the industrial land north and east of the Site, a service station of the NW and the Kelso Landfill to the south of the M5 that was operated by Council.

The Site Auditor considered the historical data supported the identification of these potential off-site sources. The Site Auditor also identified five properties in the Milperra area listed as having been notified to the EPA, with one of these located within 200 m of the Site. The EPA database listed this property at 286 Horsley Road, which is located adjacent to the Site on the eastern side of Horsley Road as shown in **Figure 1-3**. The EPA database recorded the property as being owned by Heatcraft Australia Pty Ltd, with regulation under the CLM Act not required.

The Site Auditor considered the contamination risks to the Site posed by the Heatcraft Australia property needed to be included in the CSM and assessed by the ESAs.

2.3.8 Kelso Landfill

In a 10 April 2022 article on Council's website[5], Council advised that the Kelso Landfill had been used for 73 years (i.e. since 1949). In a 2018 draft planning document (Ref [50]), Council provided a site features plan showing the location and extent of Kelso Landfill (**Figure 2-10**).

Relevant data provided by EPL 4606 for the Kelso Landfill included:

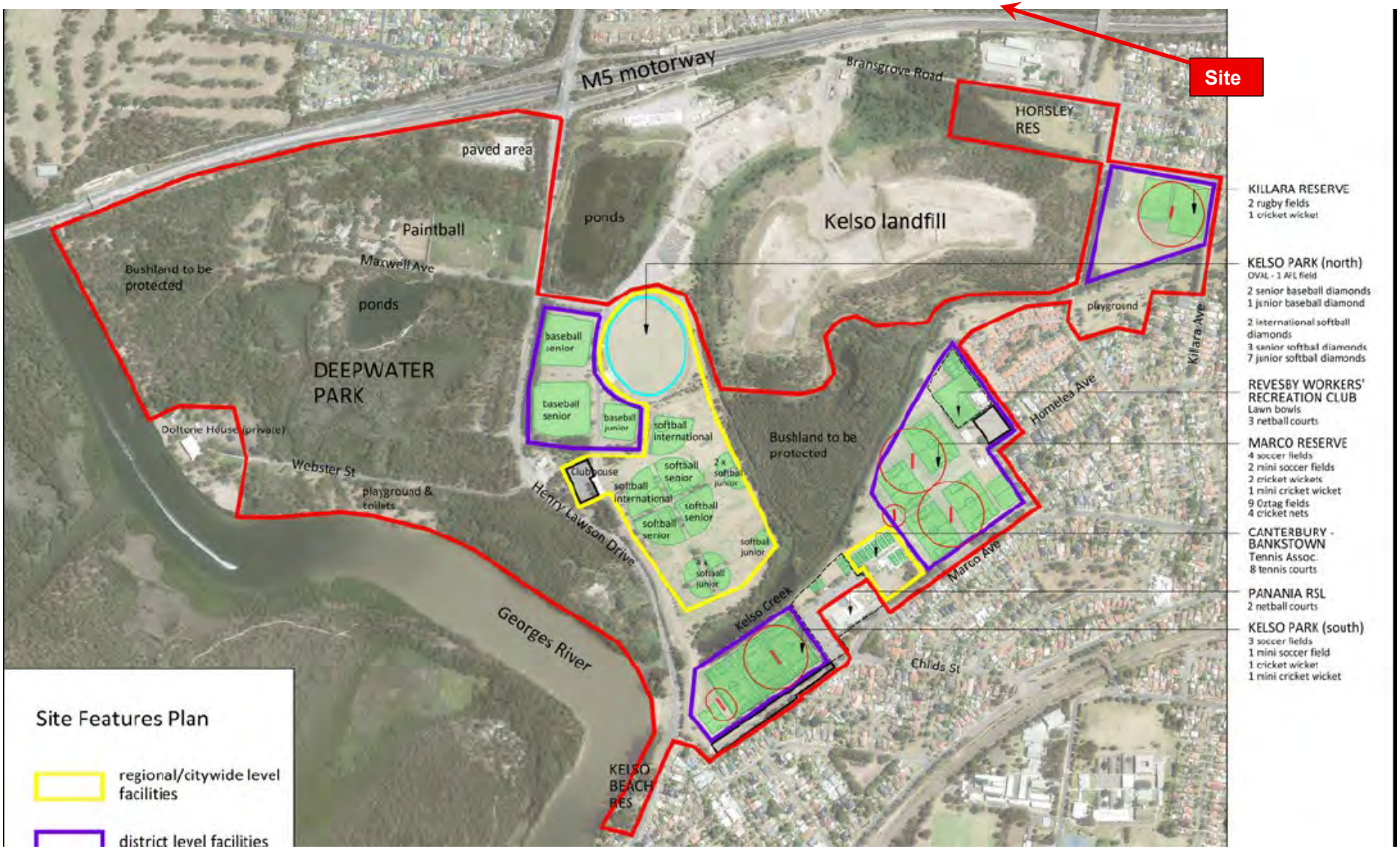
- The EPL was first issued to Council on 22/12/2000;
- The address of the landfill was given as Bransgrove Road, Milperra;
- The landfill was licensed for the non-thermal treatment of general waste and the waste disposal by application to land;
- The wastes that Council were licensed to accept included garden waste, putrescible waste, General Solid Waste (**GSW**) - non putrescible and asbestos waste;
- The landfill had the potential to generate dust, offensive odours, surface water, groundwater and LFG pollution; and
- The license required subsurface LFG monitoring at 8 locations, surface water monitoring at 9 locations, groundwater / leachate monitoring at 6 locations.

The Site Auditor considered that the Kelso Landfill posed a low risk of landfill waste being dumped at the Site because:

- The historic aerial photos (Section 2.3.2) showed that the Site was located just north of Kelso Swamp and that there was no evidence that the landfill encroached on the southern part of the Site;
- **Figure 2-10** shows that Kelso Landfill was located south of the M5 Motorway; and
- It is likely that construction of the M5 Motorway, which was completed in 1992, would have removed any landfill waste that was buried along the motorway footprint.

[5] https://www.cbcity.nsw.gov.au/your-council/media-centre/new-life-kelso-waste-facility

Figure 2-10 Site Features Plan Showing Kelso Landfill (Source: Map 1, Ref [50])



The Site Auditor considered that the Kelso Landfill posed a low risk of landfill leachate flowing onto the Site because:

- The Kelso Landfill is located south of the Site;
- Topographic survey plans (**Figure 2-2**) shows that the groundsurface slopes in a south to SW direction towards the Georges River, which suggests that groundwater in a phreatic aquifer would flow in a similar direction; and
- Hydrogeological studies indicate that groundwater flows in a south to SW direction down the Site towards the Georges River (**Section 2.15.1**).

However, the Site Auditor considered that the Kelso Landfill posed a risk of LFG migrating onto the Site because:

- The EPL allowed putrescible waste, garden waste and other biodegradable waste to be accepted at the tip;
- The EPL required to Council to continue LFG monitoring at 8 locations; and
- The proximity of the landfill to the Site (<100 m).

It is possible that construction of the M5 Motorway in 1992may have created a barrier preventing LFG migrating northward under the M5 Motorway and onto the Site. Nevertheless, this potential source of contamination needed to be included in the CSM for contamination at the Site and the risk investigated.

2.4 Site Conditions

2.4.1 Data Quality Assessment

Site condition data provided by the ESAs for the Site is summarised in **Table 2-3**.

Table 2-3: Summary of Site Condition Data

Site Condition Detail	References
Topography and Surface Conditions	
Regional and site topography	Sectn 2, Ref [1]; Sectns 2.1 & 2.3, Ref [3]; Sectn 3.3, Ref [4]; Sectn 3, Ref [11]
Conditions at site boundary (e.g. type and condition of fencing, soil stability and erosion)	Sectn 2.1, Ref [3]
On-site developments, buildings, roads, surface conditions	Sectn 2, Ref [1]; Sectn 2.1, Ref [3]
Buried services	**No data provided**
Hazardous building materials	Ref [9]
Physical evidence of contamination (visual, odours, plant stress)	Sectn 2, Ref [1]; Sectn 2.1, Ref [3]; Sectns 8.4 – 8.6, Ref [4]; Sectns 11.3 -11.5, Ref [11]
Presence of USTs, drums & wastes	**Sectn 3.6 & Appn H, Ref [3]**
Regional and site drainage patterns	Sectns 2.3 & 2.6, Ref [3]

Site Condition Detail	References
Flood potential	Not relevant
Quality of surface water	Not relevant – no on-site surface water bodies
Geology and Hydrogeology	
Regional geology and site stratigraphy	Sectn 2.4, Ref [3]; Sectn 3.1, Ref [4]; Sectn 3, Ref [11]
Borehole logs	Appn A, Ref [1]; Appn E, Ref [2]; Appn C, Ref [4]; Appn A, Ref [8]; Appn A, Ref [11]
Fill	**Sectn 2, Ref [1]; Sectn 2.1, Ref [3]; Sectn 8.2, Ref [4]**
Acid sulfate soils	Sectn 3.4, Ref [1]; Sectn 2.5, Ref [3]; Sectn 3.2, Ref [4]; Sectn 3, Ref [11]
On-site wells and springs	Sectn 3.3, Ref [1]; Sectn 2.7, Ref [3]; Sectn 3, Ref [11]
Nearby wells and springs	
Hydrogeological system operating at the site	**Sectn 3.3, Ref [1]; Sectn 2.7, Ref [3]; Sectn 3, Ref [11]**
Background groundwater quality	**Not provided**
Local meteorology	Not relevant
Surrounding Environment	
Location of nearest groundwater receptors	Sectn 2.6, Ref [3]; Sectn 3.4, Ref [4]; Sectn 3, Ref [11]
Location of nearest surface water receptors	
Surrounding land uses and details of local sensitive environments (e.g. rivers, lakes, creeks, wetlands, local habitat areas, endangered flora and fauna)	Sectn 2.6, Ref [3]; Sectn 3.4, Ref [4]; Sectn 3, Ref [11]
Surrounding areas that may pose a pollution hazard to the site	Refer Section 2.3 above

Legend:

Inadequate information provided in investigation reports

The Site Auditor assessed the accuracy of the site condition data provided in the ESAs by:

- Identifying data gaps based on EPA reporting requirements;
- Comparing the multiple lines of evidence provided by the source data;
- Reviewing publicly available data provided by Six Maps website (including the 1943 aerial photo), Google aerial views, the Council website, and maps from the Canterbury-Bankstown LEP 2023;
- Obtaining historical data from Google searches; and
- Inspecting the Site prior to and during demolition work, with a copy of photos taken provided in **Appendix D**.

The Site Auditor considered the site condition assessments provided by the ESAs were close to meeting the documentation completeness DQO. The data gaps identified were:

- Data on the potential location of septic tanks at old farm residences together with the location and type of buried service plans associated with the University of Western Sydney and the electrical easement that formed Lot 1 DP101147 at the northern end of the Site;
- Removal and disposal of the two USTs and validation of the remaining soils;
- The type, location and extent of fill at the Site; and
- Background groundwater quality, the hydrogeological regime operating at the Site, the depth to groundwater and the hydraulic conductivity of groundwater flows across the Site.

The Site Auditor addressed these data gaps by:

- Reviewing other publicly available data sources;
- Searching the Council website and EPA licence for information on the operation of the Kelso Landfill;
- Review the investigation data to assess the extent and type of fill at the Site (refer **Section 2.11**) and background groundwater quality (**Section 2.15.3**);
- Using the null-hypothesis approach in assessing contamination risks, which meant that a contamination risk was assumed to exist unless sufficient evidence indicated that such a risk was unlikely to exist; and
- Assessing the need for additional investigations to address data gaps as part of the remediation strategy.

The available site condition data relevant to an assessment of contamination risks at the Site is summarised in the following section.

2.4.2 Review of Site Condition Data

The main features described in the ESA's considered most relevant to the assessment of contamination risks at the Site, were:

- Topography, surface drainage & features: The Site had a maximum elevation of +20 mAHD decreasing to less than +5 mAHD along the southern boundary and generally sloped south and SW as shown by topographical survey plan (**Figure 2-2**). The land was generally flat in the SW part of the Site.

  The Site contained both unsealed (e.g. grassed, garden beds, woodland) and sealed area (e.g. building footprints, pavements). Rainfall would either soak into the ground in the unsealed areas or flow to on-site stormwater infrastructure in sealed areas.

- On-site developments & surface conditions: The Site is predominantly cleared eucalypt woodland and open forest, with remnants of this woodland / forest located in the conservation area in the NE corner of the Site.

  JBS&G reported that a 2017 site inspection found that:

  - Northern area: Consisted of a sealed carpark and several buildings. Mounded material was noted along the northern boundary north of the carpark. Bushland was present in the NE corner of the Site. A daycare facility with carpark were located in the SW corner of the

bushland (Note: The daycare closed in 2024). Ground levels to the north and west of this facility were higher and building rubble fragments (e.g. concrete, brick, tile) were present on the ground surface in grass bare areas;

- Central area: Two rows of student residences were located on slightly tiered land south of the hockey field. The land was stepped into three levels, with the height decreasing to the west. A sandy fill material was evident at the ground surface in grass bare areas. The bulk of the university buildings were located SE of these student residences. The majority of this area was dedicated to buildings, paved paths, grassed areas and garden beds. SE of the university buildings was a built-up area dedicated to gardens and lawns. A carpark was located to the east.
- Southern area: A sports field was located in the eastern part of this area with cut and fill used to change the natural topography. The southern boundary of the field had been built up to a height of 3m. The land in the SW corner was relatively flat with three rows of three storey residential buildings present. Brick and concrete fragments were observed across the ground surface. Playing areas were located south of these buildings.

- Buried services: No data was provided on the present and type of buried services at the Site.
- Hazardous building materials: The SEG 2024 HAZMAT identified asbestos items, lead paint, synthetic mineral fibre (**SMF**), at most structures that were present at the site in 2024 prior to demolition. Summary data on the hazardous building materials found in the structures is provided in **Appendix A**. The buildings assessed are shown in **Figure 2-11**.
- ASTs / USTs: The JBS&G (2018) PSI obtained SafeWork NSW search records for the Site. The SafeWork NSW data indicated that two USTs had been removed in the central part of the Site on 19/12/1997. Each tank had a capacity of 2,500 L, with one tank used to store unleaded petrol and the other diesel. The locations of the tanks is shown in **Figures 2-8** and **2-9**. However, no data was provided on the removal and disposal of the two USTs or the validation of remaining soils.
- Physical evidence of contamination / dumped waste: The ESAs reported:
  - The unsealed areas of the Site were vegetated (e.g. grassed, garden beds, woodlands) and showed no evidence of being impacted by contamination;
  - No odours, surface soil staining, soil discoloration or asbestos containing material (**ACM**) was observed on the ground surface. No odorous or staining was observed in subsurface soils, however visible ACM was observed at some locations; and
  - There was no evidence of fly tipping in the northern part of the Site when JBS&G inspected the Site in 2017, although plastic rubbish was noted in the understorey of bushland in the NE corner.
- Geology: The Site was underlain by residual clay soils overlying Ashfield Shale, a black to dark grey shale, that was part of the Wianamatta Group. The Kelso Landfill to the south of the Site was formed by landfill waste that was used to infill tertiary sediments that formed Kelso Swamp.

Figure 2-11 Buildings Assessed for Hazardous Building Materials (Source: Figure 2, Ref [9])



- Fill: JBS&G reported that a 2017 site inspection found evidence of cut and fill across the Site, with unnatural water channels and levelled ground surfaces observed. The Coffey 2011 DSI advised that anecdotal evidence from a gardener who has worked at the Site for 30 years suggested that the Site was developed using imported clay from an unknown source. However, no assessment was provided of the type, location and extent of fill at the Site.
- Acid Sulfate Soil (**ASS**) – The Liverpool ASS risk map showed the Site was located within in area of 'no known occurrence of ASS'. The Site Auditor considered this classification was consistent with the data provided by the Canterbury-Bankstown LEP 2023 online mapping tool, which showed the ASS risk for the Site as category 5. This meant that ASS was not typically found in this area. Works that were likely to lower the water table below 1 m AHD on adjacent class 1, 2, 3 or 4 land would trigger the requirement for assessment and may require management.
- Groundwater: The Coffey 2011 DSI reported no groundwater in boreholes drilled to depths of between 2.1 m and 6.45 m. The groundwater flow direction was considered to be to the south and SW towards the Georges River. The JBS&G 2018 PSI advised that the depth to groundwater was expected to be greater than 5m and potentially at 8 mbgl. However, the ESAs did not provide an assessment of the background water quality, hydrogeological regime operating at the Site, the depth to groundwater and the hydraulic conductivity of groundwater flows across the Site.
- Licensed wells – The ESAs advised that there were 7 licensed groundwater wells within 1 km of the Site, with a summary of these wells provided in **Table 2-4**. The Site Auditor checked these wells using the NSW licensed groundwater bore database and considered the seven monitoring bores were likely to be associated with the Heatcraft Australia notified site at 286 Horsley Road, located to the east of the Site. No other licensed wells were located within 1,000 m of the Site.

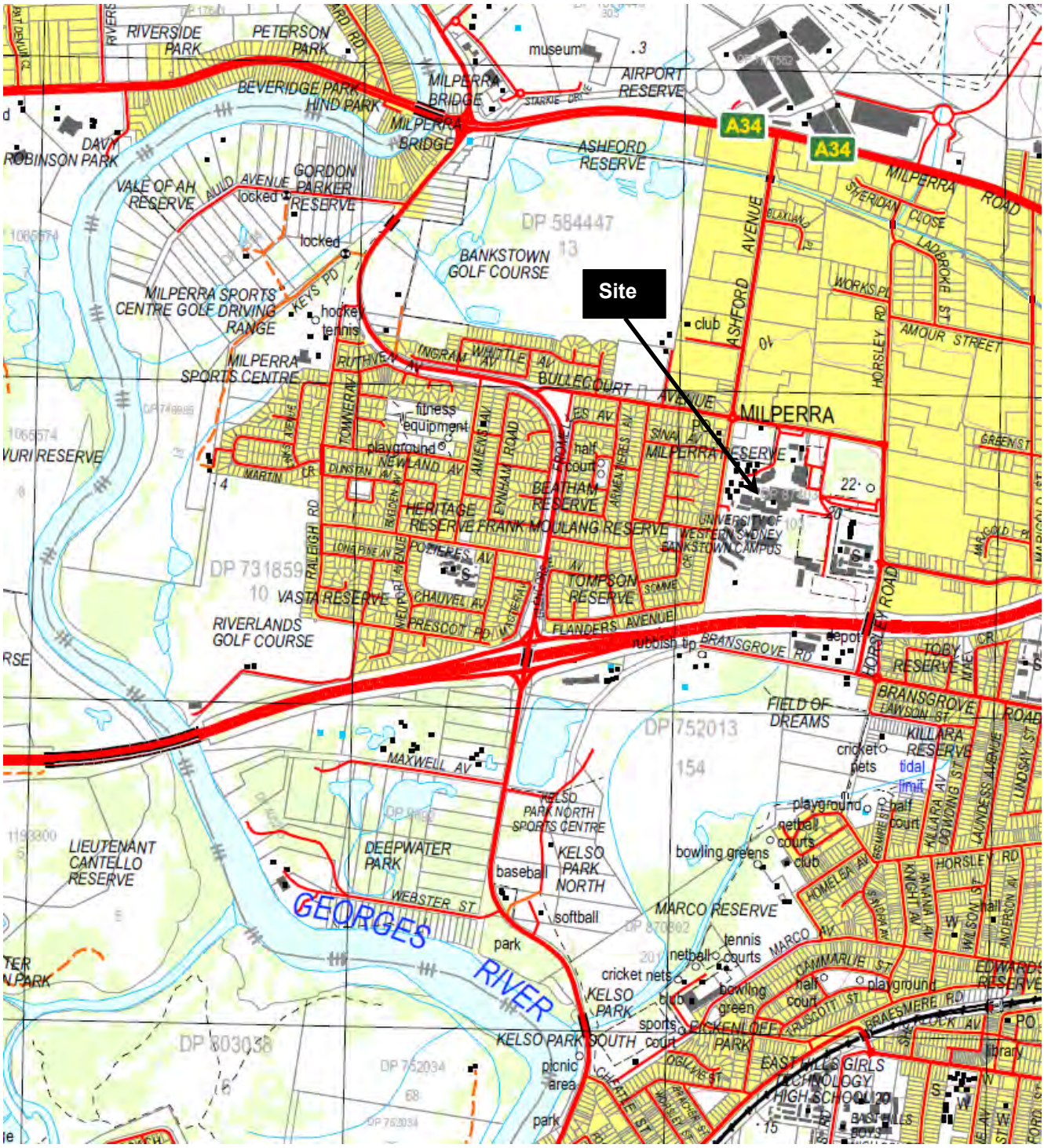
Table 2-4 Summary of Licensed Groundwater Monitoring Wells (Source: Table 2.2, Ref [3])

Well ID	Distance from Site (m)	Direction from Site	Depth (m)	Standing Water Level (m)	Purpose
GW113993	~360	North-east	-	-	Monitoring
GW113994	~430	North-east	-	-	Monitoring
GW113995	~570	North-east	-	-	Monitoring
GW113996	~600	North-east	-	-	Monitoring
GW113997	~530	North-east	-	-	Monitoring
GW113998	~440	North-east	-	-	Monitoring
GW113999	~570	North-east	-	-	Monitoring

- Surface water and groundwater receptors The ESAs identified the nearest surface water receptors to the Site as being:
  - An unnamed tributary of Kelso Creek located 300m south of the Site;
  - Kelso Creek located 600 m south of the Site; and
  - The Georges River located 1.3 km to the SW of the Site.

The Site Auditor considered the data provided on the Liverpool 9030-2S topographic map supports the identification of these nearest surface water receptors, with an extract of the map provided in **Figure 2-12**.

Figure 2-12 Surface Water Bodies in the Local Area (Source: Liverpool 9030-2S map)



- Environmentally sensitive areas: The ESAs identified environmentally sensitive areas as being:
  - An unnamed tributary of Kelso Creek located 300m south of the Site;
  - Kelso Creek located 600 m south of the Site; and
  - The Georges River located 1.3 km to the SW of the Site.

  The Site Auditor also considered that other environmentally sensitive areas that needed to be considered by the CSM were:
  - The terrestrial ecosystems in the conservation reserve in the NE corner of the Site;
  - Existing mature native trees at the Site, which are shown by purple shaded areas in **Figure 2-13**, and possibly other areas located in more detailed ecological studies undertaken for the proposed development; and
  - Future vegetation grown to be grown at the Site as part of the proposed development.

  The planning certificates provided in the JBS&G 2018 PSI showed that:
  - Lot 1 DP101147 (2A Bullecourt Av): The land was not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995; the land was not subject to a Biobanking Agreement under Part 7A of the Threatened Species Conservation Act 1995; the land was not subject to a Property Vegetation Plan under the Native Vegetation Act 2003; the land was not subject to a Tree Order under the Trees (Disputes Between Neighbours) Act 2006.
  - Lot 103 DP 874035 (2 Bullecourt Av): The land was not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995; the land was not subject to a Biobanking Agreement under Part 7A of the Threatened Species Conservation Act 1995; the land was not subject to a Property Vegetation Plan under the Native Vegetation Act 2003; the land was not subject to a Tree Order under the Trees (Disputes Between Neighbours) Act 2006.

Figure 2-13 Canterbury - Bankstown LEP 2023 Biodiversity Values Map (Source: Council website)



2.5 Preliminary Conceptual Site Model

2.5.1 Potential Sources of Contamination and Contaminants of Concern

The JBS&G 2018 PSI[6] identified six potential sources of contamination and their AECs at the Site together with their Contaminants of Potential Concern (**COPC**), which are summarised in **Table 2-5**.

Table 2-5 JBS&G 2017 AECs & COPCs (Source: Table 4.1, Ref [3])

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potentially imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial Area (Fill material)	Heavy metals, PAH, OCPs and asbestos
Groundwater along the northern and eastern boundaries adjacent commercial industrial properties	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

The Alliance 2020 DSI adopted four AECs that are described in **Table 2-6** and shown in **Figure 2-14**.

Table 2-6 Alliance 2020 AECs & COPCs (Source: Table 5.1, Ref [4])

Area of Environmental Concern (AEC)	Sources of Contamination	Contaminants of Potential Concern (CoPC)	Likely Mechanism(s) of Contamination
AEC01	Whole site – historical uncontrolled demolition, uncontrolled filling and regrading, historical farming practices.	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC02	Building Rubble Burial Area (refer Coffey 2011 & JBS&G 2018)	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC03	Uncontrolled large-scale filling/ bulk soil storage.	Metals, TRH, BTEX, PAH, PCB, OCP/OPP, Phenols and Asbestos (0.001%).	Top down
AEC04	Underground storage or petroleum-based product onsite (refer JBS&G 2018).	Metals, PAH, BTEX, TRH.	Sub-surface release

[6] Section 4.1, Ref [3]

Figure 2-14 Location of AECs Adopted by Alliance 2020 DSI (Source: Figure 3, Ref [4])



The AECs adopted by the Alliance 2020 DSI covered the entire Site. The Site Auditor considered this was appropriate given that the site history data indicated there was a risk of asbestos contamination anywhere at the Site.

The Site Auditor also considered the available site history and site condition data summarised in **Sections 2.3** and **2.4** supported the identification of the potential sources of contamination and AECs adopted by the Alliance 2020 DSI together with the following additional AECs:

- Buried services that may include abandoned septic tanks at old farm residences together with the location and type of buried service plans associated with the University of Western Sydney and the electrical easement that formed Lot 1 DP101147 at the northern end of the Site. COPCs included asbestos, PCBs and other hazardous building materials and wastes (e.g. heavy metals, PAHs, OCPs and pathogens for abandoned septic tanks).
- LFG migrating from Kelso Landfill and posing a soil vapour risk to the southern part of Site.
- Groundwater contamination migrating from upgradient industrial properties to the north and east of the Site for the COPCs identified by the JBS&G 2017 PSI and ammonia and PFAS.

The later ESAs prepared by SEG / EGA varied the location and extent of the AECs used by the Alliance 2020 DSI. In order to avoid confusion when documenting the ESA reviews presented in this SAR, the Site Auditor adopted an AEC layout modelled on the ones used in the SES 2024 DSI and the EGA 2025 DSI, supplemented by additional AECs as described above and to ensure the entire Site was covered.

The layout of the AECs adopted by the Site Auditor were considered to better reflect the different types of laydown mechanisms associated with potential contamination at each AEC, particularly with regard to asbestos. Such an approach would better allow assessments of the likely nature and extent of contamination at each AEC. The laydown mechanisms most relevant to each AEC were:

- AEC01 – Contaminated fill outside building footprints in western area: Spillage of asbestos during historic construction and demolition work, imported and reworked fill
- AEC01a - Footprint of former childcare centre (post-demo): As per AEC01
- AEC02 – Contaminated fill at southern area (excl. sports field): Imported and reworked fill
- AEC03 – Contaminated fill outside building footprints in central area: As per AEC01
- AEC04 – Former UST area: Fuel spills / leakage
- AEC05 – Contaminated fill at building footprints (post-demolition): As per AEC01 but controlled fill was likely to have been placed
- AEC06 – LFG: Migrating from Kelso Landfill
- AEC07 – Groundwater: Migrating onto Site along northern and eastern boundaries.
- AEC08 – Buried services & abandoned septic tanks: Associated contamination
- AEC09 – Buried contamination in other parts of Site:
    - AEC09a – Southern sports field: Imported fill
    - AEC09b - Carparks and main roadway: Imported fill AEC01 but controlled fill was likely to have been placed

- AEC09c - Northern conservation reserve: Fly tipping of asbestos

The layout of the AECs adopted by the Site Auditor are shown in **Figure 2-15**, with a summary of the AECs and their associated COPCs provided in **Table 2-7**.

Table 2-7: Area and Contaminants of Potential Concern

Area of Environmental Concern	Heavy metals (1)	TRH	BTEX	VOCs	PAHs	OCPs / OPPs	PCBs	Asbestos	PFAS	Microbial (2)	LFG
AEC01 – Contaminated fill outside building footprints in western area	✓	✓	✓		✓	✓	✓	✓			
AEC01a - Surface soils & fill at footprint of former childcare centre (post-demo)	✓							✓			
AEC02 – Contaminated fill at southern area (excl. sports field)	✓	✓	✓		✓	✓	✓	✓			
AEC03 – Contaminated fill outside building footprints in central area	✓	✓	✓		✓	✓	✓	✓			
AEC04 – Former UST area	✓	✓	✓		✓						
AEC05 – Contaminated fill at building footprints (post-demolition)	✓	✓	✓		✓	✓	✓	✓			
AEC06 – LFG migrating from Kelso Landfill											✓
AEC07 – Groundwater migrating onto Site along northern and eastern boundaries	✓	✓	✓	✓	✓				✓		
AEC08 – Buried services & abandoned septic tanks	✓	✓	✓		✓	✓		✓		✓	
AEC09 - Surface soils & fill at: (a) Southern sports field (b) Carparks and main roadway (c) Northern conservation reserve	✓	✓	✓		✓	✓	✓	✓			

Legend:

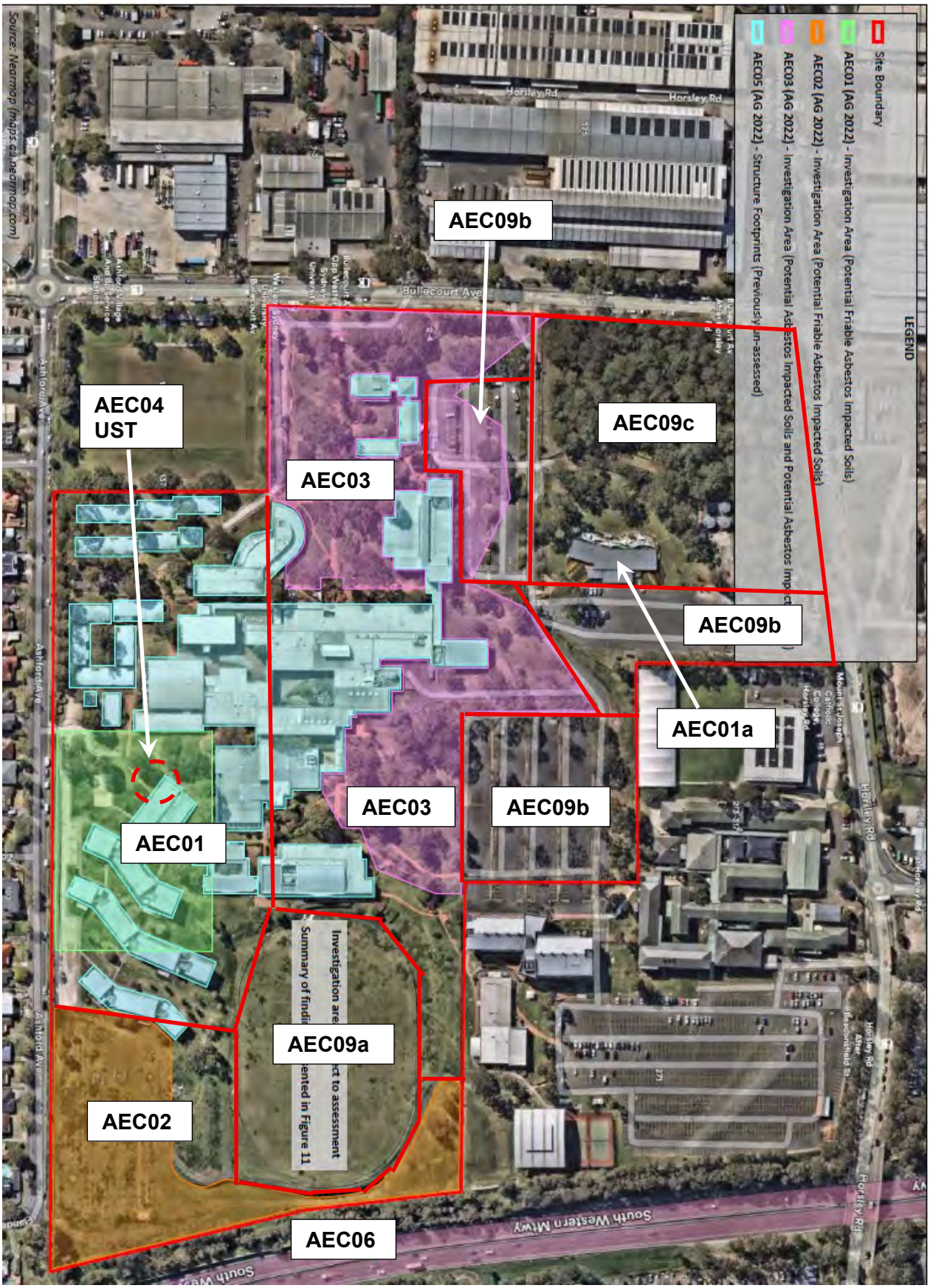
✓ Additional AECs and/or COCPs included by Site Auditor

(1) The heavy metal suite comprised As, Cd, Cr, Cu, Pb, Mn, Ni and Zn

(2) The microbial suite comprised E.Coli, faecal coliforms and salmonella

TRH = Total recoverable hydrocarbons; BTEX = Benzene / Toluene / Ethylbenzene / Xylenes; PAHs = Polycyclic aromatic hydrocarbons; OCPs = Organochlorine pesticides; OPPs = Organophosphate pesticides; PCBs = Polychlorinated biphenyls

Figure 2-15 Location of AECs Adopted by Site Auditor (Source: Base plan Figure 2, Ref [11])



2.5.2 Potential Receptors

The potential receptors identified by the JBS&G 2018 PSI[7] were:

- Future residents;
- Construction workers associated with construction of proposed residential subdivision; and
- Nearby off-site residents and commercial / industrial workers in adjacent properties.

The Site Auditor considered that additional potential receptors needed to be considered comprising:

- On-site users of extracted groundwater for irrigation purposes;
- The on-site terrestrial ecosystem as represented by vegetation growth; and
- Off-site freshwater and marine receptors in Kelso Creek and the Georges River.

2.6 Investigation Criteria

2.6.1 Aesthetic

The second check in the EPA decision process was that '*any aesthetic issues relating to site soils have been adequately addressed*'.

The SEG 2024 DSI[8] considered the main aesthetic issues relevant to the Site were:

- No highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds);
- No hydrocarbon sheen on surface water;
- No discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature;
- No large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust);
- No presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste; and
- No soils containing residue from animal burial (e.g. former agricultural land).

The Site Auditor considered the aesthetic criteria adopted by the SEG 2024 DSI were appropriate and met EPA guidance. Foreign material in fill needed to have average and maximum concentrations of not more than 5% and 10% (dry weight), respectively[9].

[7] Section 4.1, Ref [3]
[8] Section 7, Ref [8]
[9] Criteria taken from EPA ENM Order 2014

2.6.2 Soil

The third check in the EPA decision process is that '*soils have been assessed against relevant health-based investigation levels and potential for migration of contamination from soils to groundwater has been considered*'.

The sixth check in the EPA decision process is that '*any issues relating to local area background soil concentrations that exceed relevant investigation levels have been adequately addressed in the site assessment report(s).'*

The seventh check in the EPA decision process is that '*the impacts of chemical mixtures have been assessed'*.

The Site Auditor reviewed contamination risks at the Site using the NEPM (2013) guidelines, given that they provided the currently EPA-endorsed investigation levels. Where soil investigation levels (**SILs**) were not provided by these guidelines for PCOCs, reference was made to the latest USEPA Regional Soil Levels **(RSLs**) or Canadian guidelines.

HILs are given in the NEPM (2013) guideline for four types of land uses:

- **A residential with garden / accessible soil (home-grown produce < 10% of fruit and vegetable intake; no poultry), also includes children's day care centres, preschools and primary schools**
- B residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- C public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- D commercial / industrial such as shops, offices, factories and industrial sites.

The Site Auditor considered the NEPM Residential A land use applied to the Site.

A summary of the SILs used by the Site Auditor for assessing contamination risks at the Site is provided in **Table 2-8**.

The most comprehensive set of soil criteria were provided in the Alliance 2020 DSI. The SILs used by Alliance generally agreed with the above criteria, however, there were errors and data gaps for:

- HIL A was not specified for asbestos (all forms)[10], naphthalene, TRH F1, TRH F2, TRH F3, TRH F4, BTEX, pathogens; and
- EIL A was incorrectly specified for TRH F3, TRH F4, benzene, toluene, ethylbenzene.

The Site Auditor addressed these errors and data gaps by using the criteria specified in Table 2-7 to assess contamination risks posed by the investigation data.

[10] The Alliance 2020 DSI used the more conservative presence / absence of asbestos as the criteria.

Table 2-8 Soil Investigation Levels

Substances	HILs (mg/kg)			Residential EILs (mg/kg)
	HIL A	HIL C	HIL D	
Metals / Metalloids (in sand)				
Arsenic (total)	100	300	3,000	100
Cadmium	20	90	900	--
Chromium (III)	--	--	--	400
Chromium (VI)	100	300	3,600	--
Copper	6,000	17,000	240,000	130
Lead	300	600	1,500	1,100
Mercury (inorganic)	40	80	730	--
Nickel	400	1,200	6,000	130
Zinc	7,400	30,000	400,000	720
Other Organics				
Aldrin + Dieldrin	6	10	45	--
Chlordane	50	70	530	--
Chlorpyriphos	160	250	2,000	--
DDT+DDD+DDE	240	400	3,600	180
Heptachlor	6	10	50	--
PAHs (total)	300	300	4,000	--
Benzo(a)pyrene	3 (BaP TEQ)	3 (BaP TEQ)	40 (BaP TEQ)	0.7
Phenol	3,000	40,000	240,000	--
PCBs (total)	1	1	7	--
Petroleum Hydrocarbons (0 to <1m)				
TRH F1	40	700	250	180
TRH F2	110	1,000	1,000	120
TRH F3	2,500	2,500	3,500	300
TRH F4	10,000	10,000	10,000	2,800
Benzene	0.5	77 (4)	3	50
Toluene	160	18,000 (5)	NL	85
Ethyl Benzene	55	5,300 (5)	NL	70
Xylenes (total)	40	15,000 (5)	230	45 (1)
Naphthalene	3	1,900 (5)	NL	170
Asbestos				
FA & AF (friable asbestos)	0.001% w/w			--
Bonded ACM	0.01% w/w	0.02% w/w	0.05% w/w	--
All forms of asbestos	No visible asbestos for surface soil			--
Pathogens (2)				
E. coli	<100 MPN per gram (dry wt)		--	--
Faecal coliforms	<1,000 MPN per gram (dry wt)		--	--
Salmonella	Not Detected / 50 grams of final product (dry wt)		--	--

Legend:

(1) Based on lower clay EIL criteria; (2) NSW EPA (December 2000) '*Use and Disposal of Biosolids Products'; (3)* MPN = Most probable number; Intrusive maintenance worker for vapour intrusion from CRC CARE (2011) Tech Report 10 Part 1; (4) Direct contact from CRC CARE (2011) Tech Report 10 Summary

2.6.3 Groundwater

The fourth check in the EPA decision process was that *'groundwater (where relevant) has been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered.'*

The ninth check in the EPA decision process was that '*any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier'.*

The NEPM (2013) guidelines[11] also advised that *"At the point of use or exposure, GILs may be considered as response levels: the response may include further investigation or management as appropriate. Contaminant levels marginally in excess of the GILs do not imply unacceptability or that a significant human health or ecosystem risk is likely to be present. The decision on whether clean-up is required (and, if so, to what extent) should be based on site-specific assessment. Risk assessment is one aspect of making the decision though other considerations such as practicality, timescale, effectiveness, cost, durability, relevant regulatory policy, and community acceptance are also important"*.

As previously discussed in **Section 2.5.3**, the potential receptors of groundwater contamination that needed to be considered at the Site were:

- Inhalation of vapours by on-site indoor residents or by on-site intrusive / trench workers originating from either impacted soils, impacted groundwater or light non-aqueous phase liquid / dense non-aqueous phase liquid (LNAPL / DNAPL) plumes;
- Non-potable use of extracted groundwater at the Site and off-site;
- Residents that may ingest or come in dermal contact with groundwater that seeps into basements or used for irrigation;
- Residents that may inhale vapours in basements; and
- Potential transport of impacted groundwater to environmental surface water receptors such as the freshwater ecosystems in local surface water bodies and the Georges River.

At the time groundwater investigations were undertaken at the Site and documented in the Alliance 2020 DSI, the EPA had endorsed the use of:

- The 2018 Australian New Zealand 2018 water quality guidelines (**ANZG**);
- The NHMRC (August 2018) *"Australian Drinking Water Guidelines"* (**ADWG**); and
- The HEPA (2020) "*PFAS National Environmental Management Plan*", version 2.0, which was superseded in 2025 by version 3.0.

The groundwater investigation levels (**GILs**) adopted by the Alliance 2020 DSI consisted of:

- The 95% freshwater and marine protection levels from the ANZECC 2000 guidelines; and
- The NEPM (2013) Groundwater HSLs for vapour intrusion.

[11] Refer Section 3.5 in NEPM (2013) "*Schedule B6 Guideline on The Framework for Risk-Based Assessment of Groundwater Contamination*"

The Site Auditor considered the use of the NEPM (2013) Groundwater HSLs for vapour intrusion was appropriate for the proposed land use and was included with other soil vapour criteria in **Section 2.6.4**.

However, the Site Auditor considered the other GILs adopted by the Alliance 2020 DSI were deficient because:

- The freshwater / marine ANZG 2000 criteria did not represent current EPA guidance, since these criteria had been superseded by the ANZG 2018 criteria;
- The Site Auditor considered that freshwater rather than marine aquatic criteria should be used since freshwater criteria were generally lower for dissolved metals and other contaminants of concern;
- No consideration was given to the use of recreational users of the down-gradient creeks and the Georges River, which were based on the ADWG[12] multiplied by a factor of 10; and
- No consideration was given to the risks posed for PFAS contamination entering the Site from up-gradient industrial properties.

For these reasons, this SAR adopted:

- The 95% freshwater protection levels from the ANZG guideline values as defined by their website in September 2025 and 99% freshwater protection levels for contaminants that were bioaccumulative;
- Irrigation criteria given by the ANZG guidelines, which corresponded to the ANZECC 2000 irrigation criteria;
- Recreational criteria given by the ADWG multiplied by a factor of 10; and
- PFAS criteria given by the 2025 version 3 guidelines.

A summary of the GIL's used by the Site Auditor for assessing groundwater quality at the Site is provided in **Table 2-9.**

[12] Section 2.8 in Schedule B1, NEPM (2013)

Table 2-9: Groundwater Investigation Levels

Substances	Freshwater protection levels[1] (µg/L)	Irrigation[6] (µg/L)	Recreational water[5] (µg/L)
Metals			
Arsenic (III)	24	100	100
Arsenic (V)	13		
Cadmium	0.2	10	20
Chromium (III)	3.3	100	500
Chromium (VI)	1.0		
Copper	1.4	200	20,000
Lead	3.4	2,000	100
Mercury (inorganic)	0.06	2	10
Nickel	11	200	200
Zinc	8	2,000	na[2]
Non-metallic Inorganics			
Ammonia	900	--	--
Petroleum Hydrocarbons			
TRH (C6-C9)	150 [3]	--	--
TRH (C10-C36)	600 [3]	--	--
Benzene	950	--	10
Toluene	180	--	8,000
Ethylbenzene	80	--	3,000
Xylenes	75 - 350	--	6,000
PAHs			
Naphthalene	16	--	1.2 [4]
Anthracene	PQL (0.1)	--	18,000 [4]
Fluoranthene	1.0	--	8,000 [4]
Phenanthrene	0.6	--	--
Benzo(a)pyrene	0.1	--	18
PFAS[7]			
PFOS	0.13	--	--
Sum of PFOS and PFHxS	--	--	2
PFOA	220	--	10

Notes

(1) Freshwater water protection levels from ANZG guidelines wherever available
(2) Not used
(3) Dutch (2000) Intervention Level
(4) US EPA (November 2024) RSLs – tapwater criteria (with target cancer risk 1x10-6 and hazard quotient of 1) multiplied by 10
(5) NHMRC (2022) drinking water criteria used wherever possible
(6) ANZECC (2000) LTVs for long-term use (up to 100 years) used for irrigation water criteria where possible
(7) HEPA (2025) PFAS criteria

2.6.4 Soil Vapour Criteria

The fifth check in the EPA decision process was that '*hazardous ground gases (where relevant) have been assessed against relevant health-based investigation levels and screening values.*

The ninth check in the EPA decision process was that '*any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier'*.

Volatile Petroleum Hydrocarbons

The EPA endorsed the use of the soil vapour criteria provided in Schedule B1 of the NEPM (2013) guidelines. These guidelines provided a range of criteria for the four main land use types, comprising:

- Interim soil vapour HILs for volatile chlorinated organic compounds based on soil vapour measurements (NEPM Table 1A(2) in mg/m^3);
- Soil HSLs for vapour intrusion based on soil concentrations (NEPM Table 1A(3) in mg/kg);
- Groundwater HSLs for vapour intrusion based on groundwater concentrations (NEPM Table 1A(4) in mg/L); and
- Soil vapour HSLs for vapour intrusion based on soil vapour measurements (NEPM Table 1A(5) in mg/m^3).

The NEPM (2013) guidelines also referred to the CRC CARE source documents[13], which provided additional soil vapour criteria for protecting an intrusive maintenance worker in a shallow trench.

For the purposes of this audit, the Site Auditor adopted the lowest soil vapour criteria provided for the types of land uses relevant to the Site (e.g. soils are either sand / silt / clay; depth to source in soil 0 to <1 m; and depth to groundwater 2 to <4 m. A summary of the criteria used by the Site Auditor is provided in **Table 2-10**.

The Alliance 2020 DSI did not provide vapour criteria. The Site Auditor addressed this data gap by adopting all the criteria provided in **Table 2-10**.

[13] Friebel E and Nadebaum P (September 2011) "*Technical report No. 10, Health screening levels for petroleum hydrocarbons in soil and groundwater, Part 1: Technical development document*". CRC CARE

Table 2-10: Soil Vapour Criteria from NEPM & CRC CARE Guidelines

Contaminant	Residential A	Recreational C	Commercial / industrial D	Intrusive Maintenance Worker (Shallow Trench)
Soil vapour (mg/m^3)				
Toluene	1,300	NL	4,800	NL
Ethylbenzene	330	NL	1,300	NL
Xylenes	220	NL	840	NL
Benzene	1	360	4	760
Naphthalene	0.8	410	3	880
F1	180	86,000	680	180,000
F2	130	NL	500	NL
Soil (mg/kg)				
Toluene	160	NL	NL	NL
Ethylbenzene	55	NL	NL	NL
Xylenes	40	NL	230	NL
Benzene	0.5	NL	3	77
Naphthalene	3	NL	NL	NL
F1	45	NL	260	NL
F2	110	NL	NL	NL
Groundwater (mg/L)				
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Benzene	0.8	NL	5	NL
Naphthalene	NL	NL	NL	NL
F1	1	NL	6	NL
F2	1	NL	NL	NL

Legend: NL = No limit

LFG

The ESAs provided no LFG criteria to be used to assess the risks posed by the Kelso Landfill to the southern part of the Site (i.e. AEC 8). The Site Auditor addressed this data gap by adopting the LFG screening criteria recommended in the EPA[14] (2020) "*Assessment and management of hazardous ground gases*". This criteria was:

- **Sub-surface monitoring criterion (off-site migration)**: The threshold levels for further investigation and corrective action are detection of methane at concentrations above 1% (v/v) and carbon dioxide at concentrations of 1.5% (v/v) above established natural background levels. If methane is detected at concentrations above the threshold level, the occupier must notify the EPA promptly.

[14] Section 3.6.2, EPA (2020)

- **Surface emission criteria**: The threshold level for further investigation and corrective action is 500 ppm v/v methane at any point on the landfill surface for intermediate and finally-capped areas.
- **Gas accumulation criterion – enclosed structures**: The threshold level for further investigation and corrective action is detection of methane at concentrations above 1% (v/v). If methane is detected at concentrations above the threshold level, the occupier must notify the EPA within 24 hours.

2.7 Review of Data Quality – Documentation Completeness

2.7.1 Fieldwork Documentation

Six contaminated site investigations were undertaken at the Site between 2011 and 2025 that were used by Environmental Consultants to develop remediation strategies and which have been reviewed as part of this SAR. These ESAs were:

- Ref [1] - Coffey Geotechnics (25 August 2011) '*Phase 2 Environmental Site Assessment, Student Residence Development, University of Western Sydney, Bankstown Campus"*
- Ref [2]: Noel Arnold & Associates (October 2011) '*Soil Contamination Investigation, University of Western Sydney – Bankstown Campus, Bullecourt Avenue, Milperra NSW*'
- Ref [3]: JBS&G (7 February 2018) '*Phase 1 Environmental Assessment Report, Bullecourt Ave, Milperra NSW*'
- Ref [4] - Alliance Geotechnical Pty Ltd (30 January 2020) '*Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214, Lot 103 DP874035*'
- Ref [8] - Sydney Environmental Group (22 February 2024) '*Supplementary Stage 2 Detailed Site Investigation, Western Sydney University, Milperra Campus, Milperra NSW*'
- Ref [11] - EGA (26 August 2025) '*Phase 2 Assessment – Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'

The Site Auditor was not commissioned to review sampling analysis and quality plans (**SAQPs**) or decisions made concerning the scope and methodology used by these investigations. The first time the Site Auditor was instructed to review the ESAs was for the preparation of this SAR as part of the RAP review in September 2025.

A summary of the scope of work completed for the six ESAs is provided below:

Coffeys 2011 DSI (Ref [1]): The DSI focused on the investigation of soil contamination in the western part of the Site, with a plan showing sample locations provided in **Figure 2-15**. The work involved:

- The drilling of 25 boreholes (labelled EBH1 – EBH25) using a pushtube to depths of 0.7 - 2.85m;
- Photo-ionisation detector (**PID**) headspace tests generally conducted every 0.5 m interval; and
- The collection and laboratory testing of soil samples for the COPCs.

NAA 2011 ESA (Ref [2]): The ESA focused on the investigation of soil contamination in the NE corner of the Site where a childcare centre was subsequently constructed. The report documented:

- The results of soil sampling conducted by Coffeys as part of a geotechnical investigation, which involved the drilling of three shallow boreholes (labelled BH1 – BH3) and the collection of surface soil grab samples at nine other locations (labelled S1 – S9), followed by the lab testing of soil samples for the COPCs. A plan showing these sample locations is provided in **Figure 2-16**; and
- The drilling of eight hand auger boreholes (labelled HA01 – HA08) to depths of 1.0 – 1.2m, followed by the lab testing of soil samples for the COPCs. A plan showing these sample locations is provided in **Figure 2-17.**

JBS&G 2018 PSI (Ref [3]): The PSI focused on collecting grab surface soils at 10 locations spread across the Site (labelled SS01 – SS10), followed by lab testing for the COPCs. A plan showing these sample locations is provided in **Figure 2-18**.

Alliance 2020 DSI (Ref [4]): The DSI focused on the investigation of soil and groundwater contamination across the Site outside building footprints, with a plan showing sample locations provided in **Figure 2-19**. The work involved:

- The drilling of 91 boreholes (labelled BH01 – BH102 except for test pits) using either a pushtube or solid flight auger to depths of 0.25 - 10.50m;
- The excavation of 11 test pits (labelled TP09, TP12, TP13, TP16, TP17, TP22, TP53, TP55, TP56, TP85 and TP101) to depths of 1.3 - 2.9m;
- The construction of 8 groundwater monitoring wells (labelled BH01/MW01 to BH08/MW08) to depths of 5 - 10m, screened for most of their length with a bentonite plug. The top of the well casings were also monitored;
- No PID headspace data was provided;
- The collection and laboratory testing of soil samples for the COPCs;
- The development of the eight groundwater monitoring wells on 18/12/19; and
- The collection of groundwater samples on 8/01/20 followed by their laboratory testing for the COPCs.

SEG 2024 DSI (Ref [8]): The DSI focused on the investigation of soil within land outside building footprints covering parts of AEC01 to AEC03 adopted by the Alliance 2020 DSI at the locations shown in **Figures 2-20** to **2-23**. The parts of the Site not investigated comprised the building area

located towards the centre of the Site and the sporting field located in the southern part of the Site. The work involved:

- In AEC01, the excavation of 20 test pits (labelled AEC01 TP01 – AEC01 TP23 excluding TP02, TP03, TP12) to depths of 1.2 – 1.4m;
- In AEC02, the excavation of 52 test pits (labelled AEC02 TP01 – AEC02 TP52) to depths of 0.4 – 1.7m;
- In AEC03, the excavation of 52 test pits (labelled AEC03 TP02 – TP10, TP12, TP18 – TP24, TP27 – TP30, TP32 – TP35, TP39 – TP44, TP57, TP58, TP60 – TP64, TP66 – TP68, TP70 – TP73, TP75 – TP80, TP84) to depths of 0.3 – 1.8m; and
- The collection and laboratory testing of soil samples for asbestos.

EGA 2025 DSI (Ref [11]):

The DSI focused on the investigation of soil within former building footprints following demolition (AEC05) at the locations shown in **Figure 2-24**, and the resampling of some of the borehole locations used by the past investigations (i.e. Coffey 2011 DSI, JBS&G 2018 PSI, Alliance 2020 DSI) where lab samples reported the presence of friable asbestos. The work involved:

- The excavation of 46 test pits (labelled TP01 – TP05, TP07 – TP47) at AEC05 to depths of 0.8 - 4.0m;
- The excavation of 5 test pits (labelled EBH2, EBH3, EBH5, BH39, SS10) to depths of 0.1 – 1.30m; and
- The collection and laboratory testing of soil samples for the COPCs.

Figure 2-15 Coffey 2011 DSI Investigation Locations (Source: Figure 2, Ref [1])

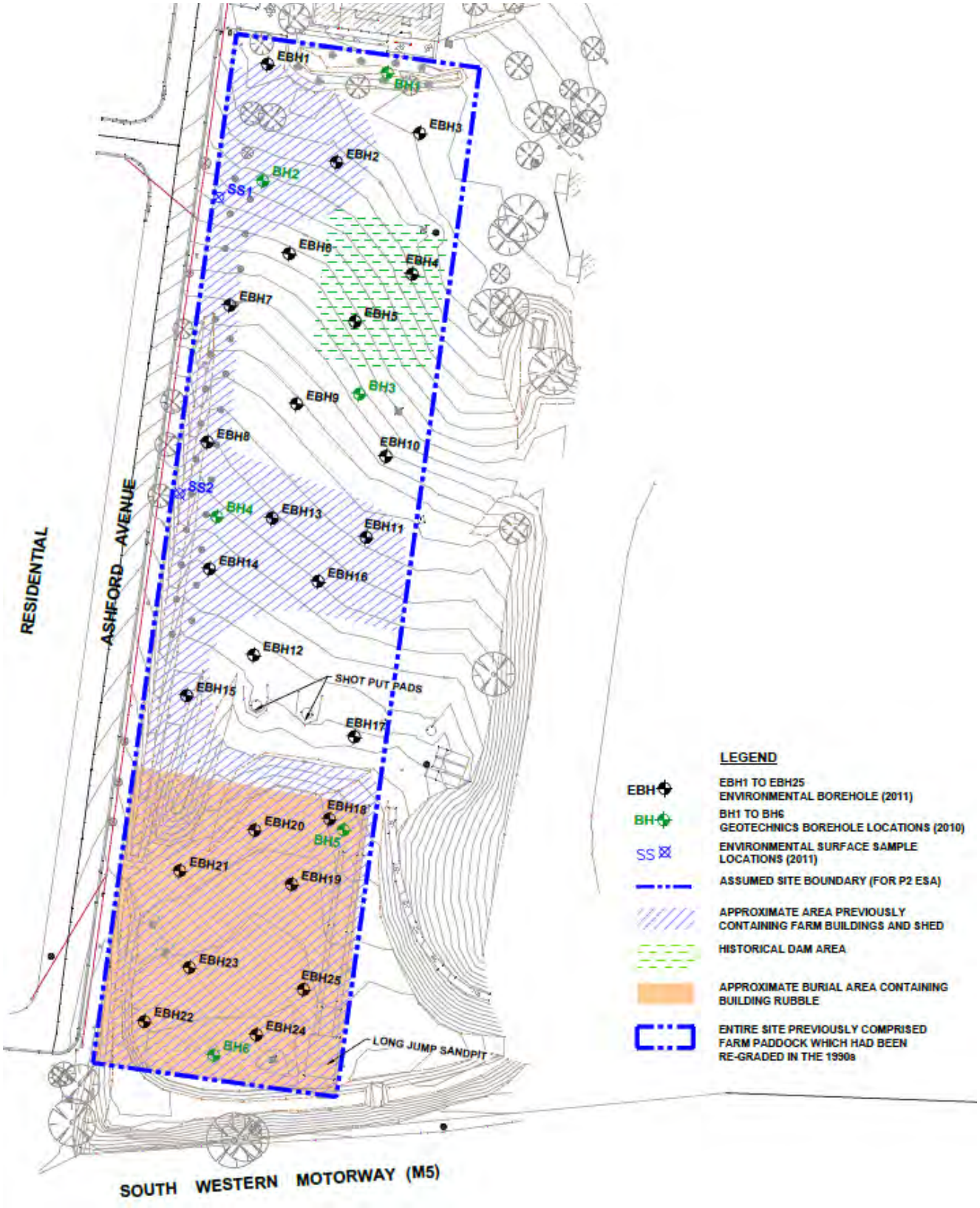
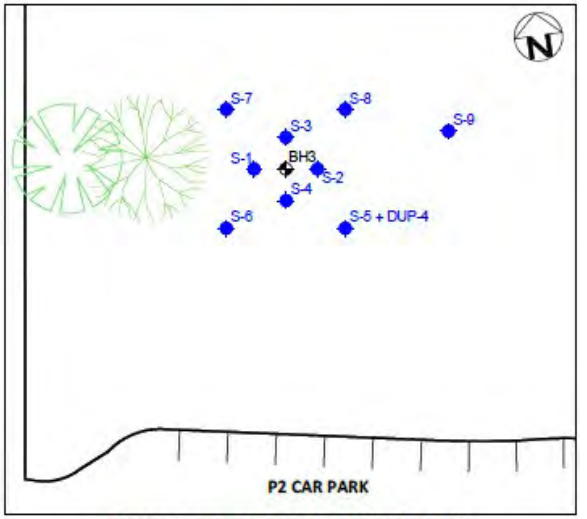


Figure 2-16 Additional Coffey Geotechnical Investigation Locations Reported by NAA 2011 ESA (Source: Appn D, Ref [2])





LOCALITY PLAN



INSERT 1 - ENVIRONMENTAL SAMPLING PLAN

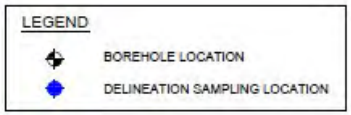


Figure 2-17 NAA 2011 ESA Investigation Locations (Source: Ref [2])



Figure 2-18 JBS&G 2018 PSI Investigation Locations (Source: Figure 3, Ref [3])



CONFIDENTIAL elyse.debrincat@nirvac.com 2018-06-28 08:38 GMT IP: 202.139.54.212

Figure 2-19 Alliance 2020 DSI Investigation Locations (Source: Figure 4, Ref [4])



Figure 2-20 SEG 2024 & EGA 2025 DSI Investigation Areas (Source: Figure 2, Ref [11])

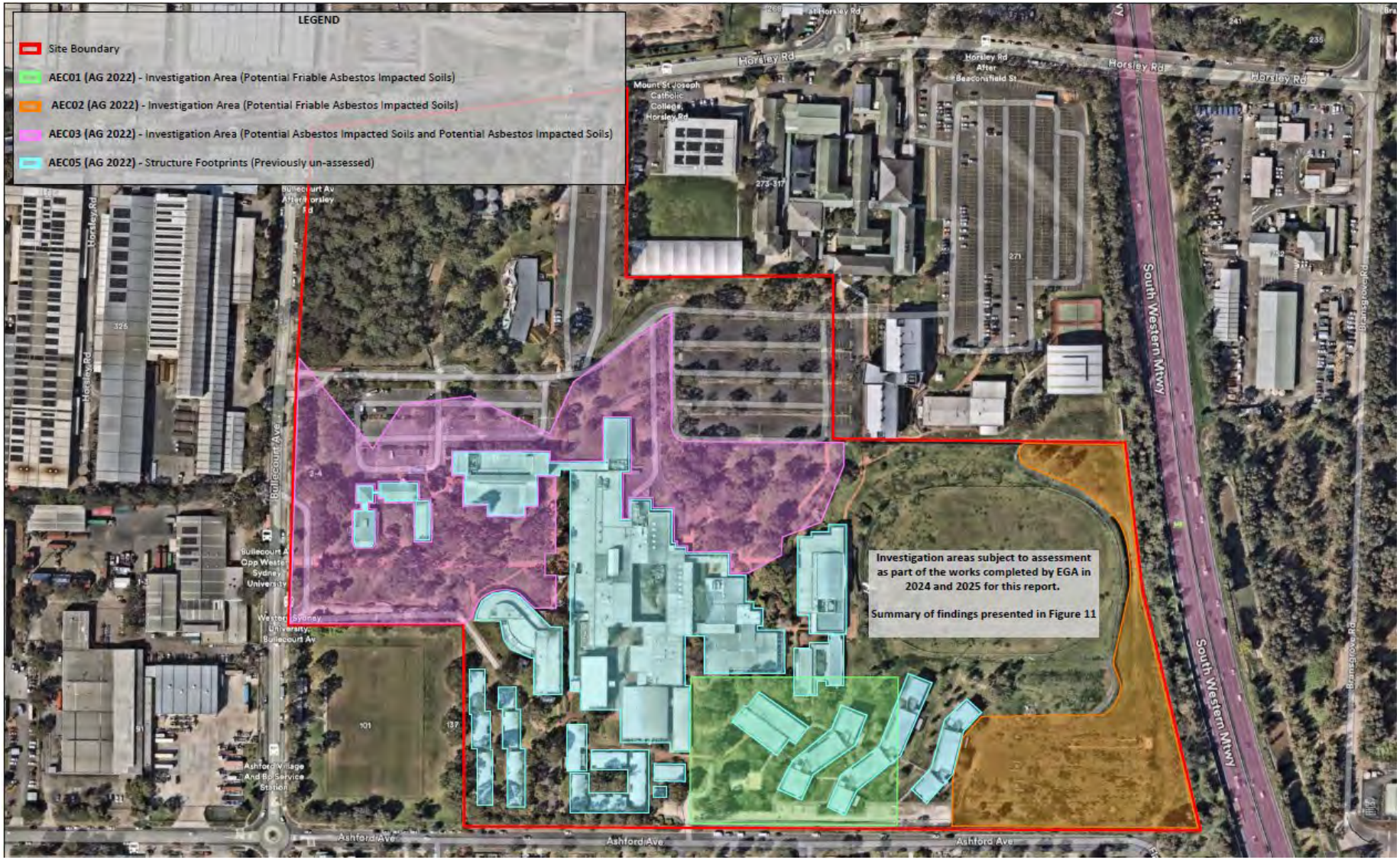


Figure 2-21 SEG 2024 & EGA 2025 DSI Investigation Locations at Part of AEC01 (Source: Figure 3, Ref [11])



Figure 2-22 SEG 2024 & EGA 2025 DSI Investigation Locations at AEC02 (Source: Figure 4, Ref [11])



Figure 2-23 SEG 2024 & EGA 2025 DSI Investigation Locations at AEC03 (Source: Figure 4, Ref [11])

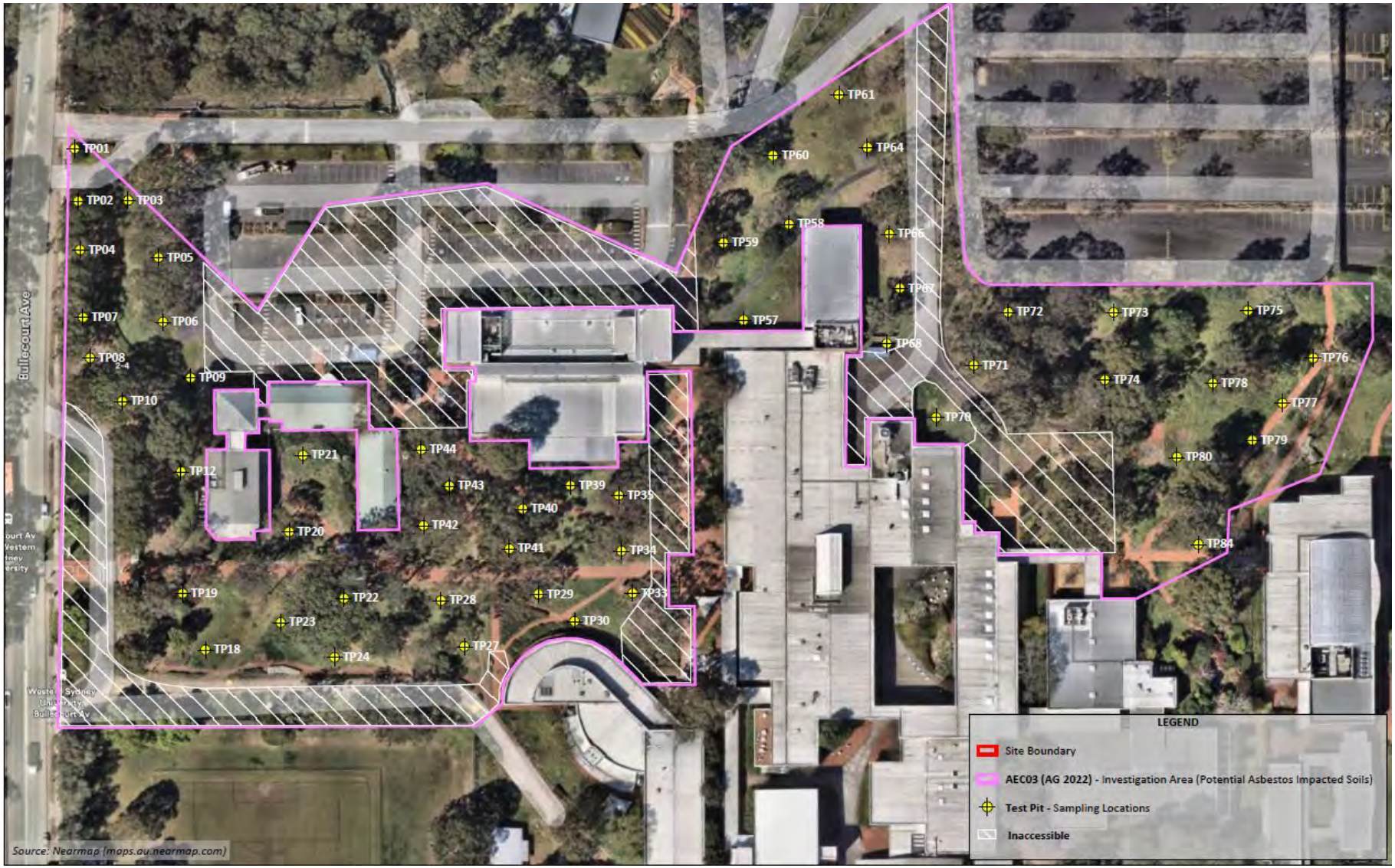
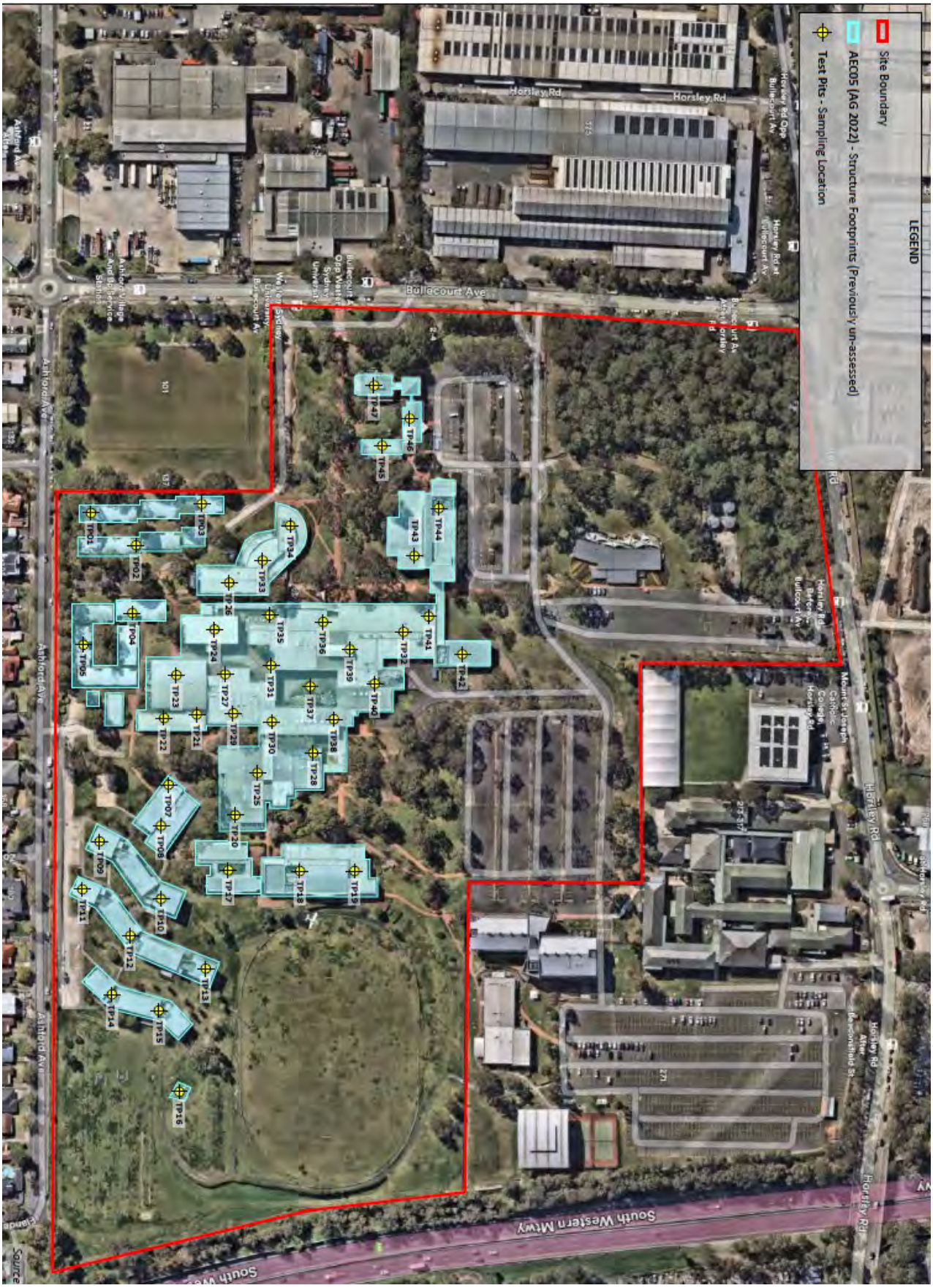


Figure 2-24 EGA 2025 DSI Investigation Locations (Source: Figure 6, Ref [11])



A summary of the fieldwork documentation provided by the four main ESAs is presented in **Table 2-11**.

Table 2-11: Summary of Fieldwork Documentation

Fieldwork Documentation	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Site inspection records	**Not provided**			
Sample location plans	Figure 2	Figure 4	Figs 2 - 5	Figs 3 - 5
Borehole / test pit logs	Appn A	Appn C	**Appn A**	**Appn A**
Investigation and soil sampling techniques	Sectn 5	Sectn 8.1	Sectn 10.1	Sectns 11.1.2 & 11.1.3
Groundwater well construction	--	Sectn 8.7	--	--
Groundwater well purging & field sampling records	--	**Not provided**	--	--
Groundwater & surface water sampling procedures	--	Sectn 8.8	--	--
Decontamination procedures	Sectn 5	Sectn 7.7.3	Sectn 8.7.4	Sectn 9.7.4
Headspace and borehole volatile gas measurements using PID	Sectn 5	**Not provided**	--	--
Calibration records for field equipment	**Not provided**	Appn D	--	--
Sample preservation methods	Sectn 5	Sectn 7.7.2	Sectn 8.7.3	Sectn 9.7.3
Description of field screening protocols	Sectns 5 & 6	Sectn 7.7.5	Sectn 10.1	Sectns 11.1.2 & 11.1.3
Use of a NATA-registered chemical laboratory/ies	Sectn 5 & Appn B	Sectn 7.7.4 & Appn G	Sectn 11	Sectn 12

Legend:
Inadequate information provided in investigation reports

Data gaps identified by the Site Auditor in the fieldwork documentation provided by the four main ESAs comprised:

- All ESAs: Site walkover inspection records.
- Coffey 2011 DSI: PID calibration records.
- Alliance 2020 DSI:
  - Groundwater well purging and field sampling records; and
  - PID measurements
- SEG 2024 DSI: The test pit log for AEC03 TP63.
- EGA 2025 DSI:
  - Test pit logs for EBH2-01 to EBH2-04, EBH3-01 to EBH3-04, EBH5-01 to EBH5-04, BH39-01 to BH39-04 and SS10-01 to SS10-04;

- Details on how EGA located the four boreholes used by past investigations (i.e. EBH2, EBH3, EBH5, BH39 and SS10) for resampling and testing for asbestos contamination; and
- Asbestos impacted soils were observed across the footprints of buildings 1, 4, 5 and 10. Appendix E of the EGA report provided copies of asbestos materials inspection reports for buildings 1 and 10 but not for buildings 4 and 5.

The Site Auditor has assessed the significance of these deficiencies in **Sections 2.11** to **2.17**.

2.7.2 Laboratory Documentation

A summary of the laboratory documentation provided by the four main ESAs is presented in **Table 2-12**.

Table 2-12: Summary of Laboratory Documentation

Laboratory Documentation	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Copy of CoC forms acknowledging receipt of date and time, and identity of samples included in shipments	Appn B	Appn G	Sectn 11, Appn C	Sectn 12 & Appn C
Laboratory test certificates	Appn B	Appn G	Appn C	Appn C
Description of the surrogates and spikes used	Appn B	Appn G	Appn C	Appn C
Record of holding times and a comparison with method specifications	Appn B	Sectn 7.7.6 & Appn G	Appn C	Appn C
Analytical test methods used by NATA-registered labs	Appn B	Sectn 7.7.6 & Appn G	Appn C	Appn C
Laboratory accreditation for analytical methods used	Appn B	Appn G	Appn C	Appn C

Legend:

Inadequate information provided in investigation reports

The Site Auditor considered that the laboratory documentation provided by the four main ESA met the DQO.

2.7.3 Contamination Assessment Documentation

A summary of the contamination assessment documentation provided by the four main ESAs is provided in **Table 2-13**.

Table 2-13: Summary of Contamination Assessment Documentation

Assessment Documentation	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Soil Contamination				
Results of grid-based survey	**Not undertaken**			
Summary of all results in a table that: • shows all essential details such as sample numbers and sample depth • shows assessment criteria • highlights all results exceeding the assessment criteria	Table LR1	**Table LAR1**	Table LAR1	**Tables LAR1 to LAR3**
Summary of PID data	Sectn 8.2 & Appn A	**Not provided**	--	
Statistical analysis of the soil data	**Not provided**	Appn H	--	--
Site plans showing all sample locations, sample identification numbers and sampling depths	Figure 2	Figure 4	**Figs 2 - 5**	Figs 3 - 5
Plans showing extent of soil contam-ination exceeding criteria for each sample depth	Figure 4	Figure 6	Figs 6 - 8	Figs 6 - 9
Assessment of aesthetically impacted materials across Site	Sectn 8.1	Sectn 11.1.3	Sectns 13.1 - 13.3	Sectns 14.1 – 14.4
Soil contamination assessment	Sectn 9	Sectn 11.1	Sectns 13.1 – 13.3	Sectns 14.1 – 14.4
Groundwater Contamination				
Summary of all results in a table that: • shows all essential details such as sample numbers and sample depth • shows assessment criteria • highlights all results exceeding the assessment criteria	--	Table LAR2	--	
Site plans showing location of groundwater monitoring wells	--	Figure 5	--	
Hydrogeological assessment	--	Sectn 8.7	--	
Site plans showing the extent of groundwater contamination exceeding criteria	--	Not required	--	
Groundwater contamination assessment	--	Sectns 11.2 & 13	--	
Ground Gas				
Summary of all results in a table that: • shows all essential details such as sample numbers and sample depth • shows assessment criteria • highlights all results exceeding the assessment criteria	--	Tables LAR1 & LAR2	--	--

Assessment Documentation	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Site plans showing location of soil vapour monitoring wells	**LFG not measured**			
Site plans showing the extent of ground gas exceeding criteria	**LFG not measured**			
Ground gas assessment	**LFG risks not assessed**			

Legend:

Inadequate information provided in investigation reports

Copies of the relevant figures and laboratory summary tables from the ESAs are provided in **Appendix A**. The Site Auditor checked the borehole / test pit logs, figures and laboratory summary tables from the ESAs using checkprints. Errors / data gaps identified in the borehole / test pit logs provided by the four main ESAs are listed in **Table 2-14**.

Table 2-14: Errors / Data Gaps in Borehole / Test Pit Logs Provided by ESAs

ESA	Location	Error / Data Gap
Coffey 2011 DSI	--	--
Alliance 2020 DSI	TP09	• Alliance Figure 6 advised that visible ACM was found at the groundsurface, which was information not included on the log; • Samples TP09 0.7-0.9 and TP09 1.1-1.3 shown in the lab summary tables were not included on the log; and • Log incorrectly gave termination depth as 1.0m rather than 1.3m.
	TP12	• Samples TP12 0.0-0.2, TP12 0.9-1.1 and TP12 2.6-2.8 shown in the lab summary tables were not included on the log; and • Log incorrectly gave termination depth as 1.0m rather than 2.8m.
	TP13	• Samples TP13 0.0-0.2 and TP13 1.9-2.1 shown in the lab summary tables were not included on the log; and • Log incorrectly gave termination depth as 0.7m rather than 2.1m.
	TP16	Samples BH16 0.0-0.2 and TP16 0.9-1.1 shown in the lab summary tables were not included on the log
	TP22	Samples TP0.0-0.2, BH22 0.8-1.0 and TP22 1.9-2.1 shown in the lab summary tables were not included on the log
	TP53	The log records an ACM fragment at 1.2m depth, which in 0.3m below the depth where natural soils commenced
	TP101	Samples BH101 0.0-0.2 in lab summary tables not included on log
	All test pits	No PID results provided
SEG 2024 DSI	AEC02 TP39	Natural clay layer labelled as fill
	AEC02 TP04	Natural clay layer labelled as fill
	AEC03 TP63	Log missing

Table 2-14 (cont'd): Errors / Data Gaps in Borehole / Test Pit Logs Provided by ESAs

ESA	Location	Error / Data Gap
SEG 2025 DSI	AEC05 TP30	Sample TP30 1.1-1.2 in natural soil not shown and the termination depth needed to be changed to 1.20m.
	AEC05 TP35	The log needed to record the presence of visible asbestos because Table 11.5.1 and Section 11.5 advised that visual evidence of ACM was observed in the area
	EBH24 & EBH25	The Coffey 2011 DSI also found asbestos (possibly friable) at locations these locations but were not reinvestigated by EGA

Errors / data gaps identified in figures and lab summary tables provided by the four main ESAs are listed in **Table 2-15**.

Table 2-15: Errors / Data Gaps in Figures / Lab Summary Tables Provided by ESAs

ESA	Error / Data Gap
Coffey 2011 DSI	--
Alliance 2020 DSI	No lab summary table provided for asbestos test results
	No PID results recorded
	Table LAR1 illegible due to very small font size
SEG 2024 DSI	The logs showed that test pits in AEC01 were not excavated at TP02, TP03 and TP12. These locations needed to be removed from Figures 3 and 6
	Figure 6 showed the estimated extent of asbestos contaminated soil at AEC01. However, no asbestos data was obtained by the DSI for TP02, TP03 and TP12, which meant the possible extent of asbestos contaminated soil needed to be expanded
	The logs showed that test pits in AEC02 were not excavated at TP35. This location needed to be removed from Figures 4 and 7
	The logs showed that test pits in AEC03 were not excavated at TP01, TP11, TP13 – TP17, TP25, TP26, TP31, TP36 – TP38, TP45 – TP56, TP59, TP65, TP69, TP74, TP81 – TP83. These locations needed to be removed from Figures 5
	A log for AEC03 TP63 needed to be provided
SEG 2025 DSI	Table LAR3 needed to show LOR at 0.01% rather than 0.001%
	ALS QA/QC data reports not provided

The Site Auditor has assessed the significance of these errors and data gaps in **Sections 2.11** to **2.17**.

2.8 Review of Data Quality – Data Completeness and Representativeness

2.8.1 Soils

Summary of the Available Data

A large amount of soil contamination data was collected across the Site by the ESAs conducted between 2011 and 2025. This data included:

- Whether the investigation location was a test pit or a borehole, which is relevant to assessing asbestos contamination risks due to the inability of boreholes to collect data on the location and extent of areas impacted by discrete asbestos fragments;
- The depth of fill at each intrusive investigation location, since fill was most at risk of being contaminated compared to the underlying natural soil;
- The sample depth and whether the sample was taken from fill or natural soil;
- Whether foreign materials were present in the fill, since the presence of such materials increase the risk of asbestos contamination;
- Whether visible asbestos was observed at the ground surface and/or buried within fill;
- Whether a fill sample was tested for asbestos and, if so, whether asbestos was detected, the type of asbestos found, its concentration and whether the asbestos HIL A criteria were exceeded;
- The maximum PD headspace reading collected at an intrusive investigation location;
- Whether odours where present
- Whether the investigation depth was limited due to refusal on a buried service; and
- The COPCs tested in the soil sample and whether the concentrations exceeded the hot-spot criteria (2.5 times HIL A or EIL A).

A summary of the soil data available for the required datasets is provided in **Table 2-16**.

Table 2-16: Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 1 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
Coffey 2011 DSI	EBH1		0.50	0.20, 0.50		1	0	1	1	1	0.0	0		1		1	1	1											
	EBH2		0.65	0.40, 0.50		1	0	0	1	1	0.0	0		1				1											
	EBH3		1.00	0.20, 0.80		1	0	0	1	1	0.0	0		1				1		1									
	EBH4		2.25	0.20, 2.00		0	0	0	1	0	0.0	0		1	1	1	1	1											
	EBH5		1.30	0.20, 1.00		0	0	0	1	1	0.0	0		1	1	1	1	1											
	EBH6		0.55	0.50		0	0	0	0		0.0	1		1				1											
	EBH7		0.80	0.60		0	0	0	1	0	0.0	0		1				1											
	EBH8		0.90	0.50		0	0	0	1	0	0.0	1		1		1	1	1											
	EBH9		0.65	0.20		0	0	0	0		0.0	1		1				1											
	EBH10		0.70	0.50		0	0	0	0		0.0	0		1				1											
Coffey 2011 DSI	EBH11		0.50	0.50		0	0	0	1	0	0.0	1		1				1											
	EBH12		0.55	0.50		0	0	0	0		0.0	0		1				1											
	EBH13		0.55	0.50		0	0	0	1	0	0.0	0		1				1											
	EBH14		0.75	0.60		0	0	0	1	0	0.2	1		1		1	1	1											
	EBH15		0.60	0.50		0	0	0	1	0	2.1	0		1				1											
	EBH16		0.55	0.20, 0.50		0	0	0	1	0	7.2	0		1				1											
	EBH17		0.35	0.20	0.50	0	0	0	0		10.1	0		1				1				1				1			
	EBH18		0.40	0.40		0	0	0	1	0	11.2	0		1				1											
	EBH19		0.35	0.20		0	0	0	1	0	1.0	0		1				1											
	EBH20		0.50	0.20		0	0	0	1	0	1.3	0		1				1											
Coffey 2011 DSI	EBH21		0.55	0.50		0	0	0	1	0	1.3	0		1		1	1	1											
	EBH22		1.10	0.20, 1.00		1	0	0	1	0	17.8	0		1	1	1	1	1		1									
	EBH23		1.80	0.20, 0.50, 1.50		0	0	0	0	0	14.8	0		1	1	1	1	1											
	EBH24		1.15	0.50, 0.70, 1.1		1	0	0	1	1	1.0	1		1	1	1	1	1		1									
	EBH25		0.55	0.20, 0.50		0	0	0	1	1	2.7	0		1	1	1	1	1											
Coffey 2011 Geotech	BH1		<0.70	0.10	0.70		0		1	0				1	1	1	1	1		1		1							
	BH2		<0.70	0.10	0.70		0		1	0				1	1	1	1	1		1		1							
	BH3		<0.70	0.10	0.70		0		1	0			Cd 8.1, Pb 4400, Zn 6800mg/kg	1	1	1	1	1		1		1							
	S1		>0.10	0.05			0		0					1															
	S2		>0.10	0.05			0		0				Pb 1800mg/kg	1															
	S3		>0.10	0.05			0		0					1															
	S4		>0.10	0.05			0		0					1															
	S5		>0.10	0.05			0		0					1															
	S6		>0.10	0.05			0		0					1															
	S7		>0.10	0.05			0		0					1															
	S8		>0.10	0.05			0		0					1															
	S9		>0.10	0.05			0		0					1															

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 2 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
NAA 2011 ESA	HA01		0.70	0.30	0.90	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA02		0.80	0.20	1.00	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA03		0.80	0.20	0.90	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA04		0.30	0.30	1.10	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA05		0.30	0.20	1.00	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA06		0.25	0.10	0.80	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA07		0.30	0.10	0.80	0	0	0	0			0		1	1	1	1					1	1	1	1				
	HA08		0.30	0.30	0.90	0	0	0	0			0		1	1	1	1					1	1	1	1				
JBS&G 2018 PSI	SS01		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS02		>0.10	0.05		1	0		1	0		0		1	1			1											
	SS03		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS04		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS05		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS06		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS07		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS08		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS09		>0.10	0.05		0	0		1	0		0		1	1			1											
	SS10		>0.10	0.05		0	0		1	1		0	FA/AF 0.019% (weathered frag)	1	1			1											
Alliance 2020 DSI	BH01/MW01		1.20	0.10	1.30	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH02/MW02		2.00	0.10, 1.50		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH03/MW03		0.80	0.10	1.60	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH04/MW04		0.20		0.30, 0.90	0	0	0	0			0										1	1	1	1	1	1	1	1
	BH05/MW05		0.20		0.30, 0.90	0	0	0	0			0										1	1	1	1	1	1	1	1
	BH06/MW06		1.50	0.10, 0.60		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH07/MW07		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH08/MW08		0.50	0.10	0.60	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		TP09	0.20	0.10	0.80, 1.20	0	1	0	1	0		0		1	1	1	1	1	1			1	1	1	1				
	BH10		0.30	0.20		0	0	0	0			0		1	1	1	1												
Alliance 2020 DSI	BH11		0.20	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
		TP12	0.50	0.10	1.00, 2.70	0	0	0	0			0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		TP13	0.10	0.10	2.00	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH14		0.20	0.10		0	0	0	0			0		1	1	1	1												
	BH15		0.20	0.10		0	0	0	0			0		1	1	1	1												
		TP16/BH16	1.90	0.10, 1.00	2.00	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1				
		TP17/BH17	>2.50	0.10, 1.00, 2.00		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH18		0.40	0.30		0	0	0	0			0		1	1	1	1												
	BH19		>0.20	0.10		0	0	0	0			0		1	1	1	1												
	BH20		0.15	0.08		0	0	0	0			0		1	1	1	1												

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 3 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
Alliance 2020 DSI	BH21		0.30	0.20		0	0	0	1	1		0	FA 0.00021 %	1	1	1	1	1	1	1	1								
		TP22/BH22	>2.10	0.10, 0.90, 2.00		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH23		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH24		>0.30	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH25		0.20	0.10		0	0	0	0			0		1	1	1	1												
	BH26		0.20	0.10		0	0	0	0			0		1	1	1	1												
	BH27		>0.40	0.10		0	0	0	1	0		0		1	1	1	1												
	BH28		1.90	0.10	0.90	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH29		0.20	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH30		0.20	0.10		0	0	0	0			0		1	1	1	1												
Alliance 2020 DSI	BH31		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH32		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH33		0.30	0.10		0	0	0	0			0		1	1	1	1												
	BH34		>0.30	0.10		0	0	0	1	0		0		1	1	1	1												
	BH35		1.40	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH36		2.00	0.10, 1.10	2.10	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1				
	BH37		0.60	0.40		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH38		0.20	0.10		0	0	0	1	0		0		1	1	1	1												
	BH39		>0.25	0.10		0	0	0	1	1		0	FA 0.043 %	1	1	1	1	1	1	1	1								
	BH40		>0.20	0.10		0	0	0	1	0		0		1	1	1	1												
Alliance 2020 DSI	BH41		>0.25	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH42		>0.30	0.10		0	0	0	1	0		0		1	1	1	1												
	BH43		>0.30	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH44		>0.30	0.10		0	0	0	1	0		0		1	1	1	1												
	BH45		0.40	0.10, 0.30		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH46		>0.30	0.10		0	0	0	1	0		0		1	1	1	1												
	BH47		>0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH48		0.50	0.10	0.60	0	0	0	1	0		0		1	1	1	1					1	1	1	1				
	BH49		0.70	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH50		0.20		0.30	0	0	0	0			0										1	1	1	1	1	1	1	1

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 4 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
Alliance 2020 DSI	BH51		0.20		0.30	0	0	0	0			0										1	1	1	1				
	BH52		0.20		0.30	0	0	0	0			0										1	1	1	1				
		TP53	0.90	0.10	1.80	1	0	1	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH54		>0.40	0.10		0	0	0	1	0		0	Refused on buried service	1	1	1	1	1	1	1	1								
		TP55	1.00	0.10, 0.90		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
		TP56	>2.20	0.10, 1.00, 1.90		1	0	1	1	0		0	Possible burial pit	1	1	1	1	1	1	1	1								
	BH57		0.20		0.30	0	0	0	0			0										1	1	1	1	1	1	1	1
	BH58		0.20		0.30	0	0	0	0			0										1	1	1	1				
	BH59		0.05	0.025		0	1	0	1	0		0		1	1	1	1												
	BH60		0.10	0.05		0	0	0	0			0		1	1	1	1												
Alliance 2020 DSI	BH61		0.15		0.225	0	0	0	0			0										1	1	1	1	1	1	1	1
	BH62		0.15	0.075		0	0	0	0			0		1	1	1	1												
	BH63		0.30	0.10		0	0	0	1	0		0		1	1	1	1												
	BH64		0.10	0.05		0	0	0	0			0		1	1	1	1												
	BH65		0.10	0.05		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH66		0.30	0.05	0.40, 1.10	0	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH67		0.10	0.05		0	0	0	0			0		1	1	1	1												
	BH68		0.10	0.05		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH69		0.05		0.125	0	0	0	0			0										1	1	1	1				
	BH70		0.05			0	0	0	0			0																	
Alliance 2020 DSI	BH71		0.40	0.10		0	0	0	1	0		0		1	1	1	1												
	BH72		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH73		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH74		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH75		0.40	0.10		0	0	0	0			0		1	1	1	1												
	BH76		0.40	0.10		0	0	0	0			0		1	1	1	1												
	BH77		0.40	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH78		0.40	0.10		0	0	0	0			0		1	1	1	1												
	BH79		0.40	0.10		0	0	0	0			0		1	1	1	1												
	BH80		0.40	0.10		0	0	0	0			0		1	1	1	1												
Alliance 2020 DSI	BH81		0.50	0.30		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH82		0.05		0.125	0	0	0	0			0										1	1	1	1				
	BH83		0.05		0.125	0	0	0	0			0										1	1	1	1				
	BH84		0.20	0.13		0	0	0	0			0		1	1	1	1												
		TP85	2.50	0.10, 1.80	2.60	1	0	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1				
	BH86		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH87		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH88		0.50	0.10		0	0	0	0			0		1	1	1	1												
	BH89		0.60	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH90		0.50	0.05		0	0	0	1	0		0		1	1	1	1	1	1	1	1								

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 5 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
Alliance 2020 DSI	BH91		0.90	0.05		0	0	0	1	0		0		1	1	1	1												
	BH92		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH93		0.60	0.10		0	0	0	0			0		1	1	1	1												
	BH94		0.60	0.10		0	0	0	0			0		1	1	1	1												
	BH95		0.50	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH96		>0.30	0.05		0	0	0	1	0		0		1	1	1	1												
	BH97		0.70	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH98		0.20	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
	BH99		0.80	0.10, 0.30		0	0	0	1	0		0		1	1	1	1												
	BH100		0.20		0.30	0	0	0	0			0										1	1	1	1				
		TP101/BH101	1.30	0.10, 0.90	1.40	0	1	0	1	0		0		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	BH102		0.30	0.10		0	0	0	1	0		0		1	1	1	1	1	1	1	1								
SEG 2024 DSI		AEC01 TP01	>1.20	0.25		0	0	0	1	0		0																	
		AEC01 TP04	1.10	0.25		0	0	0	1	0		0																	
		AEC01 TP05	1.10	0.25		0	0	0	1	0		0	AF/FA<0.001%																
		AEC01 TP06	>1.30	0.25		1	0	0	1	0		0																	
		AEC01 TP07	>1.20	0.25		0	0	0	1	0		0																	
		AEC01 TP08	>1.10	0.25		0	0	0	1	0		0																	
		AEC01 TP09	>1.20	0.25		0	0	0	1	0		0																	
		AEC01 TP10	>1.20	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC01 TP11	>0.90	0.25		0	0	0	1	0		0																	
		AEC01 TP13	>0.90	0.25		0	0	0	1	0		0																	
		AEC01 TP14	>1.00	0.25		1	0	1	1	0		0																	
		AEC01 TP15	>1.10	0.25		0	0	0	1	0		0																	
		AEC01 TP16	>1.00	0.25		0	0	1	1	0		0																	
		AEC01 TP17	>1.40	0.25		1	0	1	1	1		0	Bonded ACM 0.033%																
		AEC01 TP18	>1.00	0.25		0	0	0	1	0		0																	
		AEC01 TP19	>1.10	0.25		0	0	0	1	0		0																	
		AEC01 TP20	>1.00	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC01 TP21	>0.70	0.25		1	0	0	1	0		0	Refusal on buried service																
		AEC01 TP22	>1.00	0.25		0	0	0	1	0		0																	
		AEC01 TP23	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.058%																
		AEC02 TP01	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.15%																
		AEC02 TP02	>1.00	0.25		0	0	0	1	0		0																	
		AEC02 TP03	>1.00	0.25		1	0	0	1	0		0																	
		AEC02 TP04	>1.00	0.25		1	0	0	1	0		0																	
		AEC02 TP05	>1.00	0.25		0	0	0	1	0		0																	

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 6 of 11)

														CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
SEG 2024 DSI		AEC02 TP06	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.004%																
		AEC02 TP07	>1.10	0.25		1	0	0	1	0		0																	
		AEC02 TP08	>1.00	0.25		0	0	0	1	0		0																	
		AEC02 TP09	>1.10	0.25		0	0	0	1	0		0																	
		AEC02 TP10	>0.80	0.25		1	0	0	1	0		0																	
		AEC02 TP11	>0.70	0.25		1	0	1	1	1		0	Bonded 0.37%, AF/FA <0.001%																
		AEC02 TP12	>0.70	0.25		1	0	1	1	0		0																	
		AEC02 TP13	>0.90	0.25		0	0	0	1	0		0																	
		AEC02 TP14	>0.70	0.25		0	0	0	1	0		0																	
		AEC02 TP15	>0.70	0.25		0	0	0	1	0		0																	
		AEC02 TP16	>0.50	0.25		0	0	0	1	0		0																	
		AEC02 TP17	>1.20	0.25		0	0	0	1	0		0																	
		AEC02 TP18	>0.90	0.25		0	0	0	1	0		0																	
		AEC02 TP19	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.007%																
		AEC02 TP20	>0.90	0.25		1	0	1	1	1		0	Bonded ACM 0.033%																
SEG 2024 DSI		AEC02 TP21	>1.20	0.25		1	0	0	1	0		0																	
		AEC02 TP22	>1.40	0.25		1	0	1	1	1		0	Bonded ACM 0.003%																
		AEC02 TP23	>1.20	0.25		1	0	0	1	0		0																	
		AEC02 TP24	>1.20	0.25		0	0	0	1	0		0																	
		AEC02 TP25	>1.20	0.25		0	0	0	1	0		0																	
		AEC02 TP26	>1.60	0.25		1	0	0	1	0		0																	
		AEC02 TP27	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.032%																
		AEC02 TP28	>1.40	0.25		1	0	1	1	0		0																	
		AEC02 TP29	>1.40	0.25		0	0	0	1	0		0																	
		AEC02 TP30	>1.40	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC02 TP31	>1.40	0.25		1	0	0	1	0		0																	
		AEC02 TP32	>1.00	0.25		0	0	0	1	0		0																	
		AEC02 TP33	1.30	0.25		0	0	0	1	0		0																	
		AEC02 TP34	0.90	0.25		1	0	0	1	0		0																	
		AEC02 TP35	>1.40	0.25		1	0	1	1	1		0	Bonded ACM 0.003%																
		AEC02 TP36	>0.90	0.25		1	0	0	1	0		0																	
		AEC02 TP37	>0.80	0.25		0	0	0	1	0		0																	

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 7 of 11)

														CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
SEG 2024 DSI		AEC02 TP38	>0.80	0.25		1	0	1	1	1		0	Bonded ACM 0.011%																
		AEC02 TP39	>1.40	0.25		1	0	1	1	1		0	Bonded ACM 0.018%																
		AEC02 TP40	>1.30	0.25		1	0	0	1	0		0																	
		AEC02 TP41	>1.40	0.25		1	0	0	1	0		0																	
		AEC02 TP42	>1.30	0.25		1	0	1	1	0		0																	
		AEC02 TP43	>1.40	0.25		0	0	0	1	0		0																	
		AEC02 TP44	>0.40	0.25		0	0	0	1	0		0	Refusal on buried wall																
		AEC02 TP45	1.20	0.25		0	0	0	1	0		0																	
		AEC02 TP46	>1.40	0.25		0	0	0	1	0		0																	
		AEC02 TP47	>1.20	0.25		1	0	1	1	1		0	Bonded ACM 0.30%																
		AEC02 TP48	>1.70	0.25		1	0	1	1	1		0	Bonded ACM 0.019%																
		AEC02 TP49	>1.40	0.25		0	0	0	1	0		0																	
		AEC02 TP50	>1.50	0.25		0	0	0	1	0		0																	
		AEC02 TP51	>1.10	0.25		0	0	0	1	0		0																	
		AEC02 TP52	>1.20	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC03 TP02	>1.20	0.25		1	0	0	1	0		0																	
		AEC03 TP03	>1.00	0.25		0	0	0	1	0		0																	
		AEC03 TP04	>1.00	0.25		0	0	0	1	0		0																	
		AEC03 TP05	1.10	0.25		1	0	0	1	0		0																	
		AEC03 TP06	>1.80	0.25		0	0	0	1	0		0																	
		AEC03 TP07	>1.50	0.25		0	0	0	1	0		0																	
		AEC03 TP08	0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP09	0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP10	0.70	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC03 TP12	0.50	0.25		0	0	0	1	0		0																	
		AEC03 TP18	0.50	0.25		0	0	0	1	0		0																	
		AEC03 TP19	0.50	0.25		1	0	1	1	1		0	Bonded ACM 0.085%																
		AEC03 TP20	>0.80	0.25		0	0	0	1	0		0																	
		AEC03 TP21	0.80	0.25		1	0	0	1	0		0																	
		AEC03 TP22	>1.10	0.25		0	0	0	1	0		0																	
		AEC03 TP23	>1.10	0.25		0	0	0	1	0		0																	

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 8 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
SEG 2024 DSI		AEC03 TP24	>1.10	0.25		1	0	0	1	0		0																	
		AEC03 TP27	0.50	0.25		1	0	0	1	0		0																	
		AEC03 TP28	0.70	0.25		1	0	1	1	1		0	Bonded ACM 0.191%																
		AEC03 TP29	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP30	>1.00	0.25		0	0	0	1	0		0																	
		AEC03 TP32	>0.30	0.25		0	0	0	1	0		0	Refusal on buried service																
		AEC03 TP33	>0.30	0.25		0	0	0	1	0		0	Refusal on buried service																
		AEC03 TP34	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP35	>1.10	0.25		0	0	0	1	0		0																	
		AEC03 TP39	>1.00	0.25		0	0	0	1	0		0																	
		AEC03 TP40	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP41	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP42	>1.00	0.25		0	0	1	1	1		0	Bonded ACM 0.006%																
		AEC03 TP43	>0.90	0.25		1	0	0	1	0		0																	
		AEC03 TP44	>0.80	0.25		0	0	0	1	0		0																	
SEG 2024 DSI		AEC03 TP57	>1.30	0.25		1	0	1	1	1		0	Bonded ACM 0.053%																
		AEC03 TP58	>1.00	0.25		0	0	0	1	0		0																	
		AEC03 TP60	>0.80	0.25		0	0	0	1	0		0																	
		AEC03 TP61	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP62	>0.60	0.25		0	0	0	1	0		0																	
		AEC03 TP63	??	0.25		0	0	0	1	0		0	Missing log																
		AEC03 TP64	>0.90	0.25		0	0	0	1	0		0																	
		AEC03 TP66	>1.10	0.25		0	0	0	1	0		0																	
		AEC03 TP67	>0.60	0.25		0	0	0	1	0		0																	
		AEC03 TP68	>1.40	0.25		1	0	1	1	1		0	Bonded ACM 0.344%																
SEG 2024 DSI		AEC03 TP70	>1.00	0.25		1	0	1	1	1		0	Bonded ACM 0.156%																
		AEC03 TP71	>1.30	0.25		1	0	0	1	0		0																	
		AEC03 TP72	>1.50	0.25		1	0	1	1	1		0	Bonded ACM 0.002%																
		AEC03 TP73	1.20	0.25		1	0	0	1	0		0																	
		AEC03 TP75	>1.50	0.25		1	0	0	1	0		0																	
		AEC03 TP76	>1.20	0.25		1	0	0	1	0		0																	

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 9 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
SEG 2024 DSI		AEC03 TP77	1.10	0.25		1	0	0	1	0		0																	
		AEC03 TP78	1.10	0.25		0	0	0	1	0		0																	
		AEC03 TP79	1.10	0.25		1	0	0	1	0		0																	
		AEC03 TP80	>1.20	0.25		0	0	0	1	0		0																	
		AEC03 TP84	>1.10	0.25		0	0	0	1	0		0																	
EGA 2025 DSI		EBH2-01	0.65	0.40		0	0	0	1	0		0																	
		EBH2-02	0.65	0.40		0	0	0	1	0		0																	
		EBH2-03	0.65	0.40		0	0	0	1	0		0																	
		EBH2-04	0.65	0.40		0	0	0	1	1		0	Bonded ACM 0.028%																
		EBH3-01	1.00	0.80		1	0	0	1	0		0																	
		EBH3-02	1.00	0.80		1	0	0	1	0		0																	
		EBH3-03	1.00	0.80		1	0	0	1	0		0																	
		EBH3-04	1.00	0.80		1	0	0	1	0		0																	
		EBH5-01	1.30	0.20		0	0	0	1	0		0																	
		EBH5-02	1.30	0.20		0	0	0	1	0		0																	
EGA 2025 DSI		EBH5-03	1.30	0.20		0	0	0	1	0		0																	
		EBH5-04	1.30	0.20		0	0	0	1	0		0																	
		BH39-01	>0.25	0.10		0	0	0	1	0		0																	
		BH39-02	>0.25	0.10		0	0	0	1	0		0																	
		BH39-03	>0.25	0.10		0	0	0	1	0		0																	
		BH39-04	>0.25	0.10		0	0	0	1	1		0	Bonded ACM 0.024%																
		SS10-01	>0.10	0.05		1	0	0	1	0		0																	
		SS10-02	>0.10	0.05		1	0	0	1	0		0																	
		SS10-03	>0.10	0.05		1	0	0	1	1		0	Bonded ACM 0.036%																
		SS10-04	>0.10	0.05		1	0	0	1	0		0																	
EGA 2025 DSI		AEC05 TP01	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP02	>0.80	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP03	>1.00	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP04	>1.10	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP05	>1.00	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP07	1.10	0.15, 1.05	2.05	1	0	0	1	0		0		1	1	1	1	1				1	1	1	1	1			
		AEC05 TP08	1.60	0.15, 1.05	2.05	1	0	0	1	0		0		1	1	1	1	1				1	1	1	1	1			
		AEC05 TP09	0.60	0.15, 0.25		1	1	1	1	0		0		1	1	1	1	1											
		AEC05 TP10	>2.20	0.15, 1.05, 2.05		1	0	0	1	0		0		1	1	1	1	1											

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 10 of 11)

													CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
EGA 2025 DSI		AEC05 TP11	1.10	0.15, 0.45		0	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP12	1.30	0.15, 0.95		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP13	1.60	0.15, 0.35, 0.65, 1.55		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP14	1.20	0.15, 0.45, 0.85		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP15	1.20	0.15, 0.45, 0.65, 0.95		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP16	1.00	0.15, 0.45		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP17	>2.50	0.15, 1.05, 2.05		0	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP18	3.00	0.15, 1.05, 2.05		0	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP19	>2.10	0.15, 1.05, 2.05		0	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP20	1.10	0.15, 1.05	2.05	1	0	0	1	0		0		1	1	1	1	1				1	1	1	1	1			
EGA 2025 DSI		AEC05 TP21	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP22	1.20	0.15, 1.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP23	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP24	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP25	>2.10	0.15, 0.25, 0.45, 1.05, 2.05		1	0	0	1	0		1		1	1	1	1	1											
		AEC05 TP26	1.20	0.15, 1.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP27	0.70	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP28	>3.0	0.15, 0.35, 1.05, 2.05		0	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP29	0.70	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP30	0.70	0.15	1.05	1	0	0	1	0		0		1	1	1	1	1				1	1	1	1	1			
EGA 2025 DSI		AEC05 TP31	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP32	0.60	0.15, 0.55		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP33	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP34	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP35	0.60	0.15		1	1	0	1	0		0		1	1	1	1	1											
		AEC05 TP36	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP37	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP38	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP39	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP40	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											

Table 2-16 (cont'd): Summary of Soil Contamination Data for 2011 – 2025 ESAs (page 11 of 11)

														CHEMICAL COPCs IN FILL								CHEMICAL COPCs IN NATURAL SOIL							
ESA	Location ID		Depth of fill (m)	Sample depth (m)		Foreign materials present[1]	Visible asbestos		Test for asbestos		Max PID (ppm)	Odours in fill	Notes	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols	Metals	PAHs	TRH	BTEX	OCPs	OPPs	PCBs	Phenols
	Boreholes	Test Pits		Fill	Natural		At ground surface	Buried in fill	Tested	Asbestos Detected[2]																			
EGA 2025 DSI		AEC05 TP41	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP42	0.60	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP43	0.50	0.15		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP44	1.20	0.15, 1.05		1	0	0	1	0		0		1	1	1	1	1											
		AEC05 TP45	0.50	0.15		1	1	0	1	0		0		1	1	1	1	1											
		AEC05 TP46	0.50	0.15		1	1	0	1	0		0		1	1	1	1	1											
		AEC05 TP47	0.90	0.15		1	0	0	1	0		0		1	1	1	1	1											
TOTALS	**146**	**201**				**108**	**7**	**30**	**282**	**33**		**7**		**190**	**162**	**156**	**156**	**131**	**47**	**52**	**46**	**42**	**38**	**38**	**38**	**19**	**14**	**14**	**14**

Legend:

Fill depth > 1.0m indicating bulk earthworks rather than landscaping

Hot-spot by chemical COCPs or exceedance of asbestos HIL A

(1) Presence of foreign materials anywhere in fill profile and not restricted to where the sample was collected & tested. Materials described as concrete/brick/tile gravel assumed recycled products and not considered as foreign material.

(2) Asbestos detected above 0.001% w/w

EPA Sampling Requirements

The EPA (2022) "*Sampling Design Guidelines*" advised that a range of strategies could be used to determine the nature and extent of contamination at an area of land. These included[15]: judgemental sampling, systematic sampling, random sampling, stratified sampling, the Triad approach, systematic planning, and dynamic work strategies.

The ESAs[16] sought to delineate the nature and extent of contamination at the Site using a systematic sampling pattern amended by the use of judgemental sampling approach where there was enough information on the probable location of contamination.

The minimum sampling requirements recommended by EPA guidance when using a systematic sampling pattern at the various AECs present at the Site were:

- Fill impacted by asbestos (AEC01, 02, 03, 05): Section 5.3 of the WA DoH (2021) "*Asbestos Contaminated Sites in WA Guidelines*" classified the risk of asbestos as being:
  - "*Suspect*" on land having the following characteristics: uncontrolled fill with building waste, dumped waste material and/or demolished structure footprints (pre-1987). In this case the recommended sampling frequency corresponded to the number of locations given by the EPA (2022) "*Sampling Design Guidelines*" using a systematic approach that was dependent on the size of the area being investigated; or
  - "*Likely*" on land having the following characteristics: industry associated with asbestos, some isolated asbestos found and/or landfill present. In this case the recommended sampling frequency corresponded to double the number given by EPA guidelines using a systematic sampling approach; or
  - "*Known*" on land where asbestos had been identified and needed further delineation. In this case, judgmental graduated targeted sampling for linear extent and depth was required.
- Former UST area (AEC04): The EPA (April 2014) '*Technical Note: Investigation of Service Station Sites*' recommended that contamination at a UST be investigated by collecting a minimum of two samples per tank with samples taken from each tank wall and floor. When validating the soils remaining in a tank pit excavation, fresh soils from the excavation face needed to be collected from each wall and the base.
- Septic tank area (AEC08): Same as for a UST as described above.
- Asbestos pipe buried services (AEC08): Section 5.3 of the WA DoH (2021) "*Asbestos Contaminated Sites in WA Guidelines*" recommended sampling at a 5 – 10m spacing for "suspect areas". This sample sampling could be applied to validating the removal of an asbestos buried service, with samples biased to pipe joints where the risk of asbestos contamination was highest.
- Fill impacted by chemical hotspots (AEC09): Section 5.2.5 of the EPA (2022) "*Sampling Design Guidelines*" recommended that the risk of circular hotspots be assessed using a

[15] Section 5 and Appendix G, EPA (2022) "*Sampling Design Guidelines*"
[16] Section 8.7.1, Ref [8]; Section 9.7.1, Ref [11]

minimum of 55 sampling locations for a 5 ha area. With the Site having an area of 19.64 ha, this meant a minimum of 216 locations needed to be investigated.

Compliance Assessment for AEC01

This AEC concerned the risks posed by contaminated fill outside building footprints in the western part of the Site, with the extent of this area adopted by the Site Auditor shown in **Figure 2-15**. The extent of AEC01 adopted by the Site Auditor included all of AEC01 used by SEG 2024 DSI together with additional land to the north, east and south. The Site Auditor estimated the western area (including building footprints) to cover 48,500 m^2, with the western area (outside building footprints) being 50% of this area at 24,250 m^2.

AEC01 was investigated at 56 locations comprising:

- The Coffey 2011 DSI using 12 boreholes (labelled EBH1 – EBH11, EBH13) at the locations shown in **Figure 2-15**;
- The JBS&G 2018 PSI using two grab samples of surface soil (labelled SS04 and SS10) at the locations shown in **Figure 2-18**;
- The Alliance 2020 DSI using 22 boreholes (labelled BH23 - BH25, BH27, BH28, BH35 – BH46, BH95 – BH99) at the locations shown in **Figure 2-19**; and
- The SEG 2024 DSI using 20 test pits (labelled AEC01 TP01, AEC01 TP04 – TP11, AEC01 TP13 – TP23) at the locations shown in **Figure 2-21.**

The most recent ESAs issued by SES in 2024 and EGA in 2025 did not assess compliance with the data completeness and representative DQOs using all soil contamination data available for AEC01. The Site Auditor addressed this data gap by reviewing all the available data.

The ESAs also provided no data explaining the probable locations of contamination at the western area. The Site Auditor considered there was a risk of contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5ha). For a 2.425 ha area, this corresponded to 27 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for 34 locations and a test pit log for 20 locations;
- Fill was present at each sample location;
- A sample of fill was collected and tested for asbestos at 52 of the 56 locations investigated; and
- A sample of fill was collected and tested for heavy metals at 36 locations, for PAHs at 26 locations, for OCPs at 27 locations, for TRH and BTEX at 26 locations, for PCBs at 14 locations, and for OPPs at 13 locations.

The Site Auditor considered the sampling conducted at the western area met or was close to meeting the data completeness DQO for asbestos, heavy metals, TRH, BTEX, PAHs and OCPs. This is

because fill samples were sampled and tested at 26 – 52 sample locations, which exceeded or was close to the minimum number of 27 locations recommended by the EPA.

The Site Auditor considered the sampling conducted at the western area did not meet the data completeness DQO for the other COPCs (i.e. OPPs, PCBs). This is because fill samples were sampled and tested at 13 - 14 sample locations, which was well below the minimum number recommended by the EPA. The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

In terms of data representativeness, the Site Auditor considered it likely that the ESAs under-estimated the amount of asbestos contaminated fill present at AEC01. This is because:

- Buried asbestos contamination was usually randomly distributed throughout fill usually showing no pattern, making it impractical to try and determine its location and extent using discrete investigation and sampling methods;
- Localised deep burial pits containing asbestos contaminated fill were found to occur randomly at areas where the fill was greater than 1m deep. The presence and location of such burial pits would be difficult to locate using discrete investigation methods such as boreholes or test pits. An example of such a pit is shown by the log for AEC03 TP68 in **Figure 2-26**;
- No grid-based survey was reported as having been conducted across the ground surface of AEC01;
- Test pits were used at only 20 of the 56 sample locations, which meant there was an increased risk of asbestos not observed and/or sampled at the majority of sample locations;
- The fill layer was not penetrated through and into the underlying natural soil at 29 of the 56 locations investigated, representing 52% of sample locations. The test pit data provided by the SEG 2024 DSI showed that layers of asbestos contaminated fill were present below a depth of 1.0 m, as shown by the log for AEC02 TP35 in **Figure 2-25**; and
- Foreign materials such as demolition rubble were a common indicator of increased asbestos contamination risks, as demonstrated by the data summarised in **Table 2-16**. However, the SEG 2024 DSI test pit logs showed that while fill containing foreign materials was often present, most of the fill samples tested for asbestos did not contain foreign materials. Examples where fill was recorded as containing foreign materials but were not sampled and tested for asbestos included AEC01 TP06 and TP21.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Figure 2-25 SEG 2024 DSI Log for Test Pit AEC02 TP35 (Source: Appn A, Ref [8])

Sydney Environmental

ENVIRONMENTAL TESTPIT AEC02 TP35

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP35-0.2-0.3		FILL	FILL: Clayey Silty SAND, coarse grained, grey-orange, dry with rocks.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1	AEC02-TP35-1.2-1.3				Foreign materials including potential Asbestos Containing Material (ACM) observed.
1.2					No contamination indicators observed.
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

Figure 2-26 SEG 2024 DSI Log for Test Pit AEC03 TP68 (Source: Appn A, Ref [8])

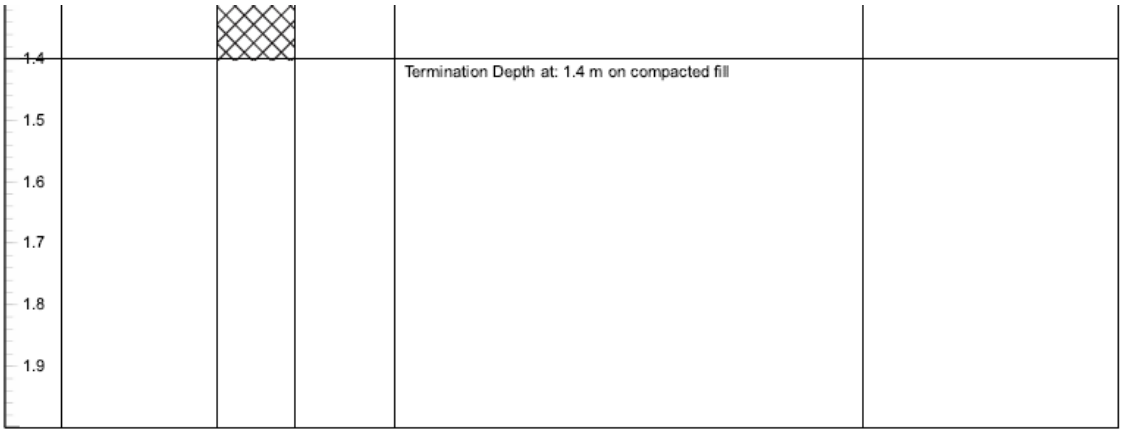
Sydney Environmental

ENVIRONMENTAL TESTPIT AEC03 TP68

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP68-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	Foreign materials including potential Asbestos Containing Material (ACM), glass, brick, metal, and cable were observed.
0.3					
0.4					
0.5			FILL	FILL: CLAY, high plasticity, orange with grey mottling, moist.	
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					



Compliance Assessment for AEC01a

This AEC concerned the contamination risks in surface soils and fill impacted by past agri-use, demolition and imported fill at the footprint of the former childcare centre (post-demolition) in the NE corner of the Site, as shown in **Figure 2-15.** The Site Auditor estimated the former childcare centre covered an area of 2,500 m^2.

AEC01a was investigated at 24 locations comprising:

- The Coffey 2011 Geotechnical Investigation using 3 boreholes (labelled BH1 – BH3) and 9 grab samples of surface soil (labelled S1 – S9) at the locations shown in **Figure 2-16**;
- The NAA 2011 ESA using 8 boreholes (labelled HA01 – HA08) at the locations shown in **Figure 2-17**;
- The JBS&G 2018 PSI using grab samples of surface soil (labelled SS01 and SS02) at the locations shown in **Figure 2-18**; and
- The Alliance 2020 DSI using 2 boreholes (labelled BH65, BH66) at the locations shown in **Figure 2-19**.

The most recent ESAs issued by SES in 2024 and EGA in 2025 did not assess compliance with the data completeness and representative DQOs using all soil contamination data available for AEC01a. The Site Auditor addressed this data gap by reviewing all the available data in this SAR.

The ESAs also provided no data explaining the probable locations of contamination at the former childcare centre. The Site Auditor considered there was a risk of contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5ha). For a 0.25 ha area, this corresponded to 3 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for 10 of the 24 sample locations;
- Fill was present at each sample location;

- 12 boreholes penetrated into the natural soils underlying the fill layer;
- A sample of fill was collected and tested for asbestos at 7 locations;
- A sample of fill was collected and tested for heavy metals at each of the 24 locations investigated;
- A sample of fill was collected and tested for PAHs at 15 locations;
- A sample of fill was collected and tested for TRH and BTEX at 13 locations;
- A sample of fill was collected and tested for OCPs at 7 locations; and
- A sample of fill was collected and tested for PCBs at 5 locations.

The Site Auditor considered the sampling conducted at the former childcare centre met the data completeness DQO. This is because fill samples at 5 - 24 locations were sampled and tested for the COPCs, which exceeded the minimum number of 3 locations recommended by the EPA.

However, the sampling did not meet the data representatives DQO. This is because:

- The former childcare centre had not been demolished, which meant no samples from under the building footprint had been collected and tested for the COPCs; and
- The Coffey 2011 Geotechnical Investigation had found hotspots of heavy metal contamination at two locations, namely, at BH3 (cadmium, lead and zinc) and S2 (lead). The ESAs did not advise whether this soil contamination had been removed prior to construction of the childcare facility or whether these contamination soil had been disturbed or otherwise remain in the area.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Compliance Assessment for AEC02

This AEC concerned the risks posed by contaminated fill in the southern part of the Site, with the extent of this area adopted by the Site Auditor shown in **Figure 2-15**. The extent of AEC02 adopted by the Site Auditor included all of AEC02 used by SEG 2024 DSI together with additional land to the east. The Site Auditor estimated the southern area to cover 26,474 m^2.

AEC02 was investigated at 83 locations comprising:

- The Coffey 2011 DSI using 13 boreholes (labelled EBH12, EBH14 – EBH25) at the locations shown in **Figure 2-15**;
- The JBS&G 2018 PSI using two grab samples of surface soil (labelled SS08 and SS09) at the locations shown in **Figure 2-18**;
- The Alliance 2020 DSI using 9 boreholes and 7 test pits (labelled BH01 - BH03, TP09, BH10, TP12, TP13, TP16, TP17, BH18 - BH21, TP22, BH26, TP101) at the locations shown in **Figure 2-19**; and
- The SEG 2024 DSI using 52 test pits (labelled AEC02 TP01 – TP52) at the locations shown in **Figure 2-22.**

The most recent ESAs issued by SES in 2024 and EGA in 2025 did not assess compliance with the data completeness and representative DQOs using all soil contamination data available for AEC02. The Site Auditor addressed this data gap by reviewing all the available data.

The ESAs also provided no data explaining the probable locations of contamination at the southern area. The Site Auditor considered there was a risk of contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5ha). For a 2.6474 ha area, this corresponded to 29 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for 22 locations and a test pit log for 52 locations;
- Fill was present at each sample location;
- A sample of fill was collected and tested for asbestos at 74 of the 83 locations investigated; and
- A sample of fill was collected and tested for heavy metals at 31 locations, for OCPs at 26 locations, for PAHs at 22 locations, for TRH and BTEX at 22 locations, for PCBs at 12 locations, and OPPs at 11 locations.

The Site Auditor considered the sampling conducted at the southern area met or was close to meeting the data completeness DQO for asbestos, heavy metals, OCPs, TRH, BTEX and PAHs. This is because fill samples were sampled and tested at 22 – 73 sample locations, which exceeded or was close to the minimum number of 29 locations recommended by the EPA.

The Site Auditor considered the sampling conducted at the southern area did not meet the data completeness DQO for the other COPCs (i.e. PCBs, OPPs). This is because fill samples were sampled and tested at 9 - 11 sample locations and well below the minimum number recommended by the EPA. The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

In terms of data representativeness, the Site Auditor considered it likely that the ESAs under-estimated the amount of asbestos contaminated fill present at AEC02. This is because

- Buried asbestos contamination was usually randomly distributed throughout fill usually showing no pattern, making it impractical to try and determine its location and extent using discrete investigation and sampling methods;
- Localised deep burial pits containing asbestos contaminated fill were found to occur randomly at areas where the fill was greater than 1m deep. The presence and location of such burial pits would be difficult to locate using discrete investigation methods such as boreholes or test pits. An example of such a pit is shown by the log for AEC03 TP68 in **Figure 2-26**;
- No grid-based survey was reported as having been conducted across the ground surface of AEC02; and
- Foreign materials such as demolition rubble are a common indicator of increased asbestos contamination risks, as demonstrated by the data summarised in **Table 2-16**. However, the

SEG 2024 DSI test pit logs show that while fill containing foreign materials was often present, some of the fill samples tested for asbestos did not contain foreign materials. Examples where fill was recorded as containing foreign materials but were not sampled and tested for asbestos included AEC02 TP03, TP04, TP07, TP10, TP21, TP23, TP31, TP36, TP40 and TP41.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Compliance Assessment for AEC03

This AEC concerned the risks posed by contaminated fill outside building footprints in the central part of the Site, with the extent of this area adopted by the Site Auditor shown in **Figure 2-15**. The extent of AEC03 adopted by the Site Auditor included all of AEC03 used by SEG 2024 DSI together with additional land to the south and a reduction in land to the east where a large carpark was located and allocated to AEC09b. The Site Auditor estimated the central area (excluding building footprints) to cover 34,000 m^2.

AEC03 was investigated at 77 locations comprising:

- The JBS&G 2018 PSI using two grab samples of surface soil (labelled SS03 and SS05) at the locations shown in **Figure 2-18**;
- The Alliance 2020 DSI using 20 boreholes (labelled BH08, BH31, BH47 - BH49, BH54, BH59, BH67, BH68, TP85, BH86 - BH94, BH102) and three test pits (labelled TP53, TP55, TP56) at the locations shown in **Figure 2-19**; and
- The SEG 2024 DSI using 52 test pits (labelled AEC03 TP02 – TP10, TP12, TP18 – TP24, TP27 – TP30, TP32 – TP35, TP39 – TP44, TP57, TP58, TP60 – TP64, TP66 – TP68, TP70 – TP73, TP75 – TP80, TP84) at the locations shown in **Figure 2-21.**

The most recent ESAs issued by SES in 2024 and EGA in 2025 did not assess compliance with the data completeness and representative DQOs using all soil contamination data available for AEC03. The Site Auditor addressed this data gap by reviewing all the available data.

The ESAs also provided no data explaining the probable locations of contamination at the central area. The Site Auditor considered there was a risk of contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5ha). For a 3.4 ha area, this corresponded to 38 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for 20 locations and a test pit log for 55 locations;
- Fill was present at each sample location;
- A sample of fill was collected and tested for asbestos at 70 of the 77 locations investigated; and

- A sample of fill was collected and tested for heavy metals and PAHs at 25 locations, for TRH and BTEX at 23 locations, for OCPs at 15 locations, for PCBs and OPPs at 13 locations.

The Site Auditor considered the sampling conducted at the central area met the data completeness DQO for asbestos. This is because fill samples were sampled and tested at 70 sample locations, which exceeded the minimum number of 38 locations recommended by the EPA.

The Site Auditor considered the sampling conducted at the central area did not meet the data completeness DQO for the other COPCs (i.e. heavy metals, TRH, BTEX, PAHs, OPPs, PCBs). This is because fill samples were sampled and tested at 13 - 25 sample locations, which was well below the minimum number recommended by the EPA. The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

In terms of data representativeness, the Site Auditor considered it likely that the ESAs under-estimated the amount of asbestos contaminated fill present at AEC03. This is because:

- Buried asbestos contamination was usually randomly distributed throughout fill usually showing no pattern, making it impractical to try and determine its location and extent using discrete investigation and sampling methods;
- Localised deep burial pits containing asbestos contaminated fill were found to occur randomly at areas where the fill was greater than 1m deep. The presence and location of such burial pits would be difficult to locate using discrete investigation methods such as boreholes or test pits. An example of such a pit is shown by the log for AEC03 TP68 in **Figure 2-26**;
- No grid-based survey was reported as having been conducted across the ground surface of AEC03;
- The fill layer was not penetrated through and into the underlying natural soil at 41 of the 52 locations investigated, representing 79% of sample locations. The test pit data provided by the SEG 2024 DSI showed that layers of asbestos contaminated fill were present below a depth of 1.0 m, as shown by the log for AEC02 TP35 in **Figure 2-25**; and
- Foreign materials such as demolition rubble were a common indicator of increased asbestos contamination risks, as demonstrated by the data summarised in **Table 2-16**. However, the SEG 2024 DSI test pit logs showed that while fill containing foreign materials was often present, many fill samples tested for asbestos did not contain foreign materials. Examples where fill was recorded as containing foreign materials but were not sampled and tested for asbestos included AEC03 TP02, TP05, TP21, TP24, TP43, TP71, TP73, TP75, TP76, TP77 and TP78.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Compliance Assessment for AEC04

This AEC concerned the risks posed by petroleum hydrocarbon contamination at the former UST area at the location shown in **Figure 2-15.** Historical data (**Section 2.3.6**) advised that two USTs were removed in the central part of the Site on 19/12/1997. Each tank had a capacity of 2,500L, with one tank used to store unleaded petrol and the other diesel. The locations of the tanks are shown in **Figures 2-8** and **2-9**.

None of the ESAs provided validation data collected at the time the USTs were removed. It was likely that the USTs were removed to make way for the construction of new buildings as part of an expansion of the university campus. The closest boreholes to the former USTs locations were BH43 and BH45 drilled by the Alliance 2020 DSI (**Figure 2-19**). The borelogs did not indicate that the former UST pit was encountered.

The Site Auditor has assessed the significance of these deficiencies in **Section 2.13**.

Compliance Assessment for AEC05

This AEC concerned the risks posed by contaminated fill at building footprints (post-demolition), with the extent of this area shown by the blue shading in **Figure 2-15.** EGA advised that the area of AEC05 covered 37,000 m^2.

AEC05 was investigated by the EGA 2025 DSI using 46 test pits (labelled AEC05 TP01 to TP47 excluding TP06) at the locations shown in **Figure 2-24**. Generally one test pit was excavated for each building footprint.

The EGA 2025 DSI provided no data explaining the probable locations of contamination at the building footprints. The Site Auditor considered there was a risk of asbestos contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5 ha). For a 3.7 ha area, this corresponded to 41 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A test pit log was prepared for each of the 46 sample locations;
- Fill was present at each sample location;
- A sample of fill was collected and tested for asbestos at each of the 46 locations; and
- A sample of fill was collected and tested for heavy metals, PAHs, TRH, BTEX and OCPs at each of the 46 locations.

The Site Auditor considered the sampling conducted at the building footprints met the data completeness DQO. This is because fill samples from 46 locations were investigated and tested for the COPCs, which exceeded the minimum number of 41 locations recommended by the EPA.

The Site Auditor considered that the sampling data provided by the ESAs for AEC05 was close to meeting the data representativeness DQO. This is because:

- The fill layer was penetrated through and into the underlying natural soil at most of the locations investigated (35 out of 46 locations representing 76% of sample locations;
- The EGA 2025 DSI data indicated that asbestos contamination was only found in shallow fill, with the deepest asbestos contamination found down to a depth of 0.60 m at AEC03 TP09; and

- Foreign materials such as demolition rubble were a common indicator of increased asbestos contamination risks, as demonstrated by the data summarised in **Table 2-16**. The EGA 2025 DSI test pit logs showed that fill samples tested for asbestos were practically always taken from fill containing foreign materials when present at the sample location.

Nevertheless, the Site Auditor considered it was still likely that the ESAs under-estimated the amount of asbestos contaminated fill present at AEC05. This is because:

- No grid-based survey was reported as having been conducted across the ground surface of AEC05;
- Buried asbestos contamination was usually randomly distributed throughout fill in localised areas, making it impractical to try and determine its location and extent using discrete investigation and sampling methods; and
- Localised deep burial pits containing asbestos contaminated fill were found to occur randomly at areas where the fill was greater than 1m deep. The presence and location of such burial pits would be difficult to locate using discrete investigation methods such as boreholes or test pits. An example of such a pit is shown by the log for AEC03 TP68 in **Figure 2-26**.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Compliance Assessment for AEC08

This AEC concerned the risks posed by contamination from buried services and abandoned septic tanks associated with the former rural / residential land use. The ESAs provided no data on the possible location of buried services or abandoned septic tanks at the Site.

The Site Auditor considered it was not feasible to address this data gap by means of investigations using discrete sampling techniques, and that the most practical approach was to locate and remove buried services and abandoned septic tanks (if present) during bulk earthworks at the Site. This recommendation is included in the review of the site management strategy in **Section 2.18**.

Compliance Assessment for AEC09a

This AEC concerned the contamination risks in surface soils and fill impacted by past agri-use, demolition and imported fill at the southern sports field, with the extent of this area shown in **Figure 2-15.** The Site Auditor estimated the sports field covered an area of 14,800m^2.

AEC09a was investigated at 9 locations comprising:

- The JBS&G 2018 PSI using a grab sample of surface soil (labelled SS07) at the location shown in **Figure 2-18**; and
- The Alliance 2020 DSI using 8 boreholes (labelled BH11, BH14, BH15, BH29, BH30, BH32 - BH34) at the locations shown in **Figure 2-19**.

The most recent ESAs issued by SES in 2024 and EGA in 2025 did not assess compliance with the data completeness and representative DQOs using all soil contamination data available for AEC09a. The Site Auditor addressed this data gap by reviewing all the available data in this SAR.

The ESAs also provided no data explaining the probable locations of contamination at the sports field. The Site Auditor considered there was a risk of contamination at any location given the absence of data on the fill used. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5ha). For a 1.48 ha area, this corresponded to 16 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for 8 of the 9 sample locations;
- Fill was present at each sample location;
- Each of the Alliance 2020 boreholes penetrated into the natural soils underlying the fill layer;
- A sample of fill was collected and tested for asbestos at 4 locations;
- A sample of fill was collected and tested for heavy metals and PAHs at each of the 9 locations;
- A sample of fill was collected and tested for TRH and BTEX at 8 of the 9 locations; and
- A sample of fill was collected and tested for OCPs, OPPs and PCBs at 2 - 3 locations.

The Site Auditor considered the sampling conducted at the southern sports field did not meet the data completeness DQO. This is because fill samples at only 2 – 9 locations were sampled and tested for the COPCs, which was below the minimum number of 16 locations recommended by the EPA. The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

The Site Auditor considered that the sampling data provided by the ESAs for AEC09a met or was close to meeting the data representativeness DQO. This is because:

- The fill layer was penetrated through and into the underlying natural soil at most of the locations investigated (7 out of 9 locations representing 78% of sample locations;
- None of the logs showed the presence of foreign materials in the fill layer;
- The topographic and borehole data showed that the sports field was constructed by excavating into the natural soils, following by the spreading of a thin topsoil layer. The borehole data showed that the fill layer was generally thin (0.20m) and underlain by the natural clay soil; and
- The construction of the sports field indicated there was a low risk of asbestos or other types of soil contamination.

Compliance Assessment for AEC09b

This AEC concerned the contamination risks in surface soils and fill impacted by past agri-use, demolition and imported fill at the two main carparks and roadway in the eastern part of the Site, as shown in **Figure 2-15.** The Site Auditor estimated the northern carpark (6,900 m^2), the southern carpark (17,900 m^2) and main roadway (9,000 m^2) covered a combined area of 33,800 m^2.

AEC09b was investigated by the Alliance 2020 DSI using 17 boreholes (labelled BH04, BH05, BH50 - BH52, BH57, BH58, BH60 – BH62, BH69, BH70, BH81 – BH84, BH100) at the locations shown in **Figure 2-19**.

The ESAs provided no data explaining the probable locations of contamination at the two main carparks and roadway. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*". However, the Site Auditor noted that fill was not present below pavement at 16 of the 20 locations investigated, which meant that fill was likely to be present at only 25% of AEC09b, estimated to be an area of 8,450 m^2. Based on the EPA (2022) guideline recommended minimum sampling frequency of one location per 900 m^2 (based on the Site having a total area > 5 ha). For a 0.85 ha area, this corresponded to 20 locations.

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for each of the 17 sample locations;
- All 17 boreholes penetrated into the natural soils underlying the fill layer;
- A sample of fill was collected and tested for asbestos at only one location (BH81);
- A sample of fill was collected and tested for heavy metals, TRH, BTEX and PAHs at 4 locations, while a sample of shallow natural soil was collected and tested for these same COPCs at 12 locations; and
- A sample of fill was collected and tested for OCPs, OPPs and PCBs at only one location, while a sample of shallow natural soil was collected and tested for these same COPCs at 5 locations.

The Site Auditor considered the sampling conducted at the two main carparks and roadway did not meet the data completeness and representativeness DQOs. This is because fill samples at only 1 – 4 locations were sampled and tested for the COPCs, which was well below the minimum number of 20 locations recommended by the EPA. The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

Compliance Assessment for AEC09c

This AEC concerned the contamination risks in surface soils and fill impacted by past agri-use, demolition and imported fill at the Conservation Reserve in the NE corner of the Site, as shown in **Figure 2-15.** The Site Auditor estimated the Conservation Reserve (excluding the former childcare centre) covered an area of 24,600 m^2.

AEC09c was investigated by the Alliance 2020 DSI using 14 boreholes (labelled BH06, BH07, BH63, BH64, BH71 – BH80) at the locations shown in **Figure 2-19**.

The ESAs provided no data explaining the probable locations of contamination at the Conservation Reserve. The Site Auditor considered there was a risk of contamination at any location given the absence of data on potential sources of contamination. Consequently, the Site Auditor considered that a judgemental sampling approach was not able to meet the EPA minimum sampling requirements, and that a systematic sampling approach was required based on the minimum sampling requirements given in the EPA (2022) "*Sampling Design Guidelines*" for a 5 ha area (given that the Site had a total area >5 ha. For a 2.46 ha area, this corresponded to 27 locations (based on one sample location per 900 m^2).

The data summarised in **Table 2-16** shows that:

- A borehole log was prepared for each of the 14 sample locations;
- Fill was present at each sample location;
- Each borehole penetrated into the natural soils underlying the fill layer;
- A sample of fill was collected and tested for asbestos at 7 locations;
- A sample of fill was collected and tested for heavy metals, TRH, BTEX and PAHs at each of the 14 locations; and
- A sample of fill was collected and tested for OCPs, OPPs and PCBs at 5 locations.

The Site Auditor considered the sampling conducted at the Conservation Reserve did not meet the data completeness and representativeness DQOs. This is because:

- No grid-based survey was reported as having been conducted across the ground surface of the Conservation Reserve;
- There was potential for fly tipping of rubbish and waste in the Conservation Reserve;
- Fill samples were collected and tested for asbestos at 7 locations, which was below the minimum number of 27 locations recommended by the EPA; and
- Fill samples at only 5 – 14 locations were sampled and tested for the other COPCs, which was below the minimum number recommended by the EPA.

The Site Auditor has assessed the significance of this deficiency in **Section 2.13**.

2.8.2 Soil Vapour

Volatile Petroleum Hydrocarbons

The Site Auditor considered there was a low risk of significant soil vapour contamination being present at the Site exceeding the HIL A criteria because:

- The Site had a long history of agricultural use prior to being redeveloped for a tertiary education facility (**Section 2.3**);
- The historical data indicate that the only evidence of the bulk storage of volatile chemicals was the use of two USTs of 2,500L size that were used for storing unleaded petrol and diesel, with these tanks recorded by SafeWork NSW as having been removed in 1997 (**Sections 2.3.6 & 2.4.2**);
- None of the boreholes / test pits at the Site recorded the presence of odorous or stained soils caused by volatile chemicals;
- A total of 156 soil samples were collected across the Site and tested for TRH and BTEX, with 162 soil samples tested for PAHs;
- All soil samples measured non-detectible TRH F1 and BTEXN concentrations;
- The Coffey 2011 DSI conducted PID headspace tests at 25 locations in the western part of the Site, with practically all results at low concentrations (<5 ppm) consistent with natural background levels. The maximum concentration measured was 17.8 ppm; and

- Groundwater samples measured non-detectible TRH F1 and BTEXN concentrations, with the maximum TRH F2 concentration at a low concentration (70 µg/L) close to the detection limit and well below the GILs.

The Site Auditor considered the soil vapour risk should, if present, be restricted to remnant contamination at the former UST location, which could be addressed as part of remediation work. The need for this work is further discussed in **Section 2.18**.

LFG

AEC06 in the CSM (**Section 2.5.1**) concerned the risk of LFG migrating from Kelso Landfill under the M5 Motorway and into the southern part of the Site. As previously explained in **Section 2.3.8**, the Site Auditor considered that the Kelso Landfill posed a low risk of landfill waste being dumped at the Site, and a low risk of landfill leachate flowing onto the Site. However, Kelso Landfill posed a risk of LFG migrating onto the Site because:

- The EPL allowed putrescible waste, garden waste and other biodegradable waste to be accepted at the tip;
- The EPL required to Council to continue LFG monitoring at 8 locations; and
- The proximity of the landfill to the Site (<100 m).

It is possible that construction of the M5 Motorway in 1992 may have created a barrier preventing LFG migrating northward under the M5 Motorway and onto the Site. Nevertheless, this potential source of contamination needed to be included in the CSM for contamination at the Site and the risk investigated.

None of the ESAs investigated the presence of LFG along the southern boundary of the Site. The Site Auditor addressed this data gap by including a recommendation for such work in **Section 2.18**.

2.8.3 Groundwater

Groundwater across the Site was investigated by the Alliance 2020 DSI and involved the construction of eight monitoring wells (labelled BH01/MW01 to BH08/MW08) to depths of 6.1 – 10.5 mbgl. The wells were spread around the southern, eastern and northern boundaries. One sampling round was conducted on 8/01/20 from six of the wells followed by laboratory testing of the samples for the COPCs.

A summary of the number of groundwater samples (excluding QA samples) collected from wells located at the Site and chemically tested is provided in **Table 2-17**.

Table 2-17: Summary of Lab Tests on Groundwater Samples

Well	Field parameters[2]	Metals [1]	TRH / BTEX	PAHs	OCPs	OPPs	PCBs	VOCs	Ammonia	PFAS
Round 1 – 8/01/20										
BH01/MW01	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH02/MW02	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH03/MW03	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH04/MW04	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH05/MW05	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH06/MW06										
BH07/MW07										
BH08/MW08	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Total	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**0**

Legend:

Frequency does not meet NSW EPA recommended minimum levels

Notes:

1. The standard suite of heavy metals comprised As, Cd, Cr, Cu, Hg, Ni, Pb & Zn.
2. Field parameters = pH, Dissolved Oxygen (DO), Electrical Conductivity (EC), temperature and Redox

Minimum sampling requirements considered to meet EPA requirements were:

- Installation of a sufficient number of monitoring bores (minimum of 3) to enable triangulation of water levels across the investigation area;
- All bores to penetrate the regional water table to an extent that allowed representative discrete samples to be collected from both shallow and deep groundwater if there was a risk of DNAPL being present;
- A minimum of one well located up-gradient of potential contaminant sources in order to provide information on background conditions;
- A minimum of one well located at or immediately down-gradient of each likely contamination source in order to provide information on the groundwater quality at the likely contaminant source;
- A minimum of one well located down-gradient of the potential source zone and near the property boundary in order to provide information on migration potential of contamination, the quality of groundwater leaving the site and the likely presence of a groundwater plume;
- If contamination was found, then install and test a sufficient number of groundwater wells so that the extent of any groundwater plume was defined;

- Test a minimum of one round of groundwater samples for the COPCs. If contamination was found, then test a sufficient number of monitoring rounds to allow trends to be established;
- If groundwater contamination was found and there was a risk to off-site receptors, then conduct sufficient testing to allow the risks to these receptors to be determined;
- Collect and test groundwater samples from a range of depths if a COPC had a density greater than water; and
- Field tests to determine the hydraulic properties of the strata that form the hydrogeological system.

The Site Auditor considered the groundwater data available from the Alliance 2020 DSI was close to meeting the minimum sampling requirements for the Site:

- The six wells monitored penetrated the regional water table to an extent that allowed representative discrete samples to be collected from shallow groundwater;
- Three wells were located along the down-gradient property boundary (MW01 – MW03) sufficient to check if on-site contamination was migrating off-site (e.g. former USTs). These three wells were also capable of checking whether any leachate was migrating onto the Site from the downgradient Kelso Landfill;
- Two wells were located along the eastern boundary adjacent to the industrial properties that included the Heatcraft Australia property at 286 Horsley Road, which was notified to the EPA as a contaminated Site (**Figure 1-3**). It is also the property where five licensed groundwater monitoring wells were installed as described in **Table 2-4**;
- A well was located along the upgradient northern property boundary that was capable of providing background groundwater quality data and checking whether contamination was migrating onto the Site from the adjacent industrial land;
- A sufficient number of wells were located across the Site that allowed the location and geometry of contaminant plumes within the Site to be estimated;
- All groundwater samples were tested for most of the COPCs; and
- An accurate survey of the well collar elevations was conducted, which allowed reasonable estimates to be made of groundwater hydraulic gradients.

One data gap was that no groundwater samples were tested for PFAS. The significance of this data gap is assessed by the Site Auditor in **Section 2.15**.

2.9 Review of Data Quality - Data Comparability

The data comparability documentation provided by the four main ESAs is summarised in **Table 2-18**.

Table 2-18: Summary of Data Comparability

Data Comparability	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Appropriate field screening techniques	Sectns 5 & 6	Sectn 7.7.5	Sectn 10.1	Sectns 11.1.2, 11.1.3
Appropriate calibration of field equipment	**No certificates**	Sectn 8.3 & Appn D	--	--
Appropriate soil sampling techniques	**Sectn 5**	**Sectn 8.1**	Sectn 10.1	**Sectn 11.1.3**
Appropriate well development & purging techniques	--	**Sectn 8.8**	--	--
Accurate survey of well collars	--	Sectn 8.7	--	--
Appropriate groundwater sampling techniques	--	Sectn 8.8	--	--
Appropriate sample splitting techniques	Sectn 5 & Appn C	Sectn 9.5	Not performed	
Appropriate decontamination procedures	Sectn 5 & Appn C	Sectn 7.7.3	Sectn 8.7.4	
Appropriate containers (including preservation) used for soil & groundwater samples	Sectn 5, Appn B & C	Sectn 7.7.2	Sectn 8.7.3	Sectn 9.7.3
Appropriate sample storage and transportation	Sectn 5, Appn B & C	Sectn 7.7.2	Sectn 8.7.3	Sectn 9.7.3
Appropriate management of chain of custody forms	Sectn 5, Appn B & C	Appn G	Sectn 11, Appn C	Sectn 13.2, Appn C
Samples tested within recommended holding times	Appn B & C	Sectn 9.1	Sectn 8.7.7, Appn C	Sectn 9.7.7, Appn C
The laboratory test methods complied with the 2013 NEPM Guideline	Appn B & C	Sectn 7.7.6 & Appn G	Sectn 8.7.6, Appn C	**Sectn 11.1.3**
Appropriate PQL's for the analytes tested	Appn B & C	Sectn 7.7.6 & Appn G	Sectn 8.7.7, Appn C	Sectn 9.7.7, Appn C

Legend:

Inadequate information provided in investigation report

The Site Auditor considered that the four main ESAs generally met the data comparability DQO. The deficiencies identified were:

- Narrow boreholes were used by the Coffey 2011 DSI (55 – 75 mm diameter) and the Alliance 2020 DSI (pushtubes with diameter not specified) to investigate asbestos contamination and collect soil samples for testing. The NEPM (2013) guidelines[17] advised that test pitting was the preferred investigation technique for asbestos contamination, but if boreholes were used, then large diameter boreholes with a diameter not less than 150 mm were needed to ensure

[17] Section 11.3.1, NEPM (2013) Schedule B2 guidelines

the soil profile was accurately logged and representative soil samples for assessing asbestos contamination were collected.

- The Alliance 2020 DSI provided no copies of well purging and sampling records or of the water quality meter calibration records, which meant that it was not possible for the Site Auditor to determine if the groundwater samples were correctly collected.
- EGA 2025 DSI: The soil samples tested for asbestos generally weighed 50 – 70g, which is well below the 500 g recommended by the NEPM (2013) guidelines[18].

The Site Auditor considered these deficiencies when reviewing the soil contamination assessment in **Section 2.13**.

2.10 Review of Data Quality - Precision & Accuracy

The data precision and accuracy documentation provided by the four main ESAs is summarised in **Table 2-19**.

Table 2-19: Summary of Precision & Accuracy Compliance

Precision & Accuracy	Coffey 2011 DSI (Ref [1])	Alliance 2020 DSI (Ref [4])	SEG 2024 DSI (Ref [8])	EGA 2025 DSI (Ref [11])
Use of properly trained and qualified field personnel	Appn C	**Sectn 6.1**	Sectn 9.1	Sectn 10.1
Blind field duplicates collected at a minimum rate of 1 in 10	Sectn 8.4, Appn C	Sectn 9.5	Not required as asbestos only tested	Sectns 9.5.3, 13
RPD's less than 30% for inorganic and 50% for organic analyses	Sectn 8.4, Appn C	Sectn 9.5 & Table LAR3		
Acceptable levels for equipment rinsate blanks	Not required	Sectns 7.5.1 & 7.6	Sectns 8.5.1, 8.7.4	Sectns 9.5.1, 9.7.4
Acceptable levels for field & trip blanks	Sectn 8.4, Appn B & C	Sectns 9.3 & 9.4	Not required as asbestos only tested	Sectn 9.5.2, 13
Acceptable levels for laboratory-prepared trip spike results for volatile analytes	Sectn 8.4, Appn B & C	Sectns 9.4 & 9.6		
Laboratory QC criteria achieved	Sectn 8.4, Appn B & C	Sectn 10 & Appn G	Sectns 11 & 12, Appn C	Sectns 12 & 13, Appn C

Note:
The EPA acceptance criteria for method blanks and spike recovery results are specified in Schedule B(2) in the NEPM (2013) *'Guideline on Data Collection, Sample Design and Reporting'* and Section 8 of AS4482.1-1997.

Legend:
Inadequate information provided in investigation reports

[18] Section 11.3.2, NEPM (2013) Schedule B2 guidelines

The Site Auditor considered that most of the ESAs generally met the data comparability DQO. However, the Site Auditor was concerned regarding the competence of the personnel who worked on the Alliance 2020 DSI because:

- Narrow boreholes with pushtube samplers were primarily used. It was not possible for the nature and extent of foreign materials and asbestos fragments to be determined and recorded on borehole logs and for representative samples to be collected for asbestos analysis;
- The borehole logs did not properly describe the nature and extent of foreign materials in fill at borehole locations. Generally the logs described the presence of foreign materials as concrete and brick gravels, and did not advise whether the foreign materials were likely to be building and demolition (**B&D**) waste where asbestos contamination may also be present;
- None of the Alliance boreholes identified the presence of visible asbestos at locations investigations, which is in contrast to the records provided by test pits excavated for the SEG 2024 DSI and the EGA 2025 DSI;
- A significant number of soil samples tested for asbestos were taken from undisturbed natural soils, where the presence of anthropogenic asbestos was not possible; and
- Errors recorded in borehole logs prepared by Alliance, as summarised in **Table 2-14**.

The Site Auditor considered that these deficiencies in the Alliance 2020 DSI meant it was likely that this ESA under-estimated the nature and extent of asbestos contamination in fill at the Site. The Site Auditor has assessed the significance of these deficiencies in **Section 2.13**.

2.11 Aesthetic Issues

The second check in the EPA decision was that '*any aesthetic issues relating to site soils have been adequately addressed*'.

The main aesthetic issues relevant to the Site were considered to be the location and extent of fill at the Site and the amount of anthropogenic material in the fill, the presence of visible asbestos, the presence of odorous and stained soils and groundwater, and the presence of buried services.

The ESAs[19] advised that no odorous or stained soils were found by the investigations. The borehole and test pit logs also suggested that the fill consisted predominantly of soil mixtures that could be reused for residential land use if not contaminated above the SILs.

The main aesthetic issue concerned the nature and extent of fill at the Site because:

- The data provided by the ESAs indicated that the primary contamination risk for the Site was associated with asbestos contamination in the fill layer;
- The main laydown mechanisms for asbestos contamination were associated with the spillage of asbestos fragments onto the ground from historic demolition, the burial or mixing of asbestos waste in soil as a result of earthworks conducted at the Site, and the potential importation of asbestos contaminated fill and its use in past developments;
- A layer of fill of varying thickness covered practically the whole Site; and

[19] Sections 8.4 & 8.5, Ref [4]

- The residential development proposed by Mirvac required a large amount of excavation and filling work to achieve the final site grades.

None of the ESAs assessed the nature and extent of fill at the Site. The Site Auditor addressed this data gap by reviewing the available data for the AECs that cover most of the Site, comprising AEC01 – AEC03, AEC05, AEC09a and AEC09b.

AEC01 – Western area

The depth of fill data provided by the 56 locations used to investigate the AEC01 western area is summarised in **Figures 2-27** to **2-29**. The data showed that the fill thickness in the western area was variable probably due to past university developments, which ranged from 0.20 m to at least 2.25 m (EBH4). Variations could occur in relatively short distances, which may be due to the presence of burial pits or buried services. For these reasons:

- It was unlikely that accurate estimates of the quantity of fill at AEC01 could be obtained; and
- There was a risk that asbestos contamination may remain at AEC01 if only a thin upper fill layer was removed.

The Coffey 2011 DSI and the SEG 2024 DSI identified foreign materials in the fill at 25% (i.e. 8 of 32) of the locations investigated[20]. These foreign materials consisted mainly of B&D waste, which was a risk factor in terms of possible asbestos contamination.

The Site Auditor considered these stratigraphic conditions at AEC01 needed to be accounted for by any remediation and subsequent bulk earthworks undertaken in the area. This issue is further discussed in **Section 2.18**.

[20] Note: Data from the Alliance 2020 DSI was not considered because uncertainty remained with regard to the accuracy of the fill descriptions given in their borelogs.

Figure 2-27 AEC01 Western Area Fill Thickness Data from Coffey 2011 DSI (units: m)

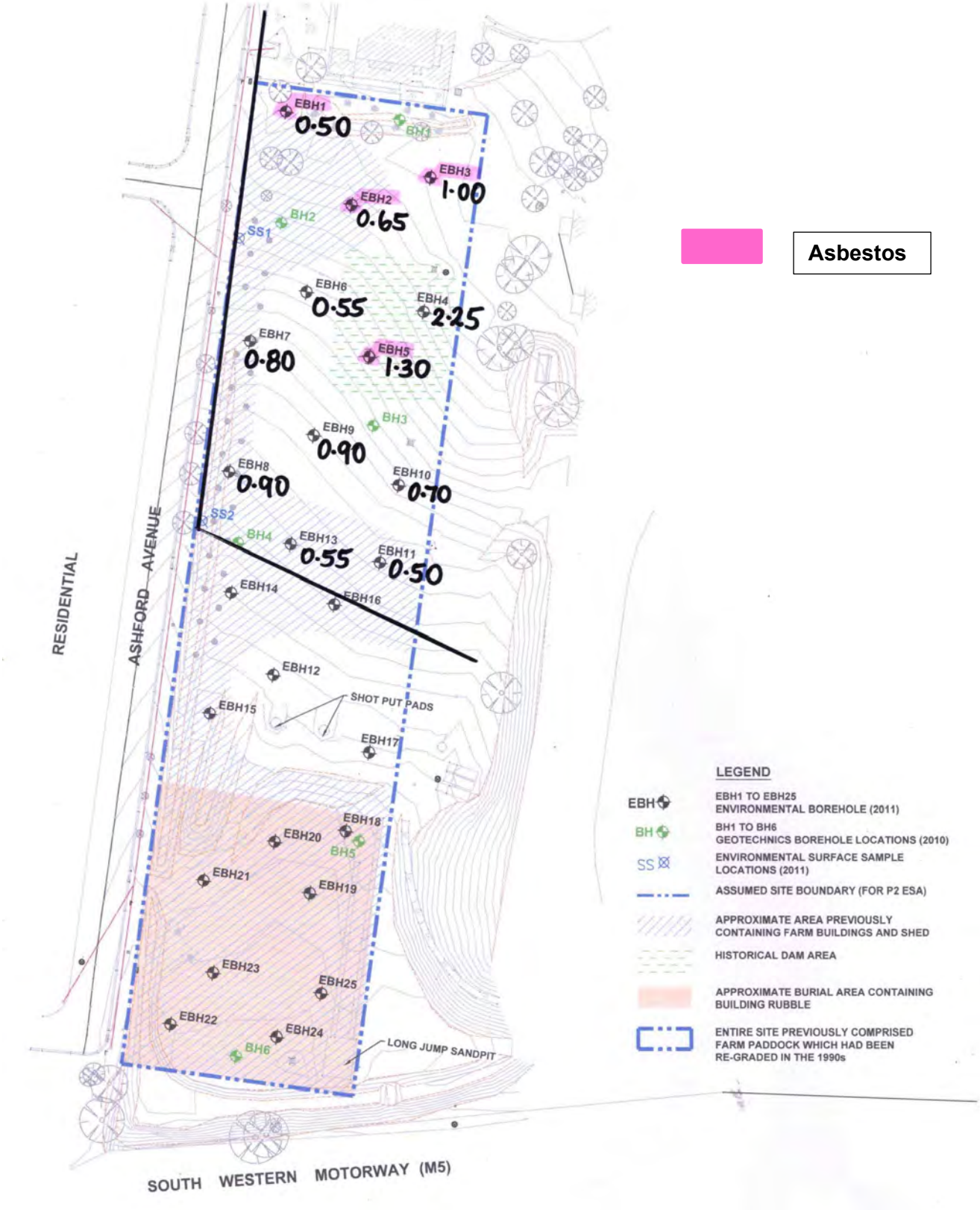


Figure 2-28 AEC01 Western Area Fill Thickness Data from Alliance 2020 DSI (units: m)

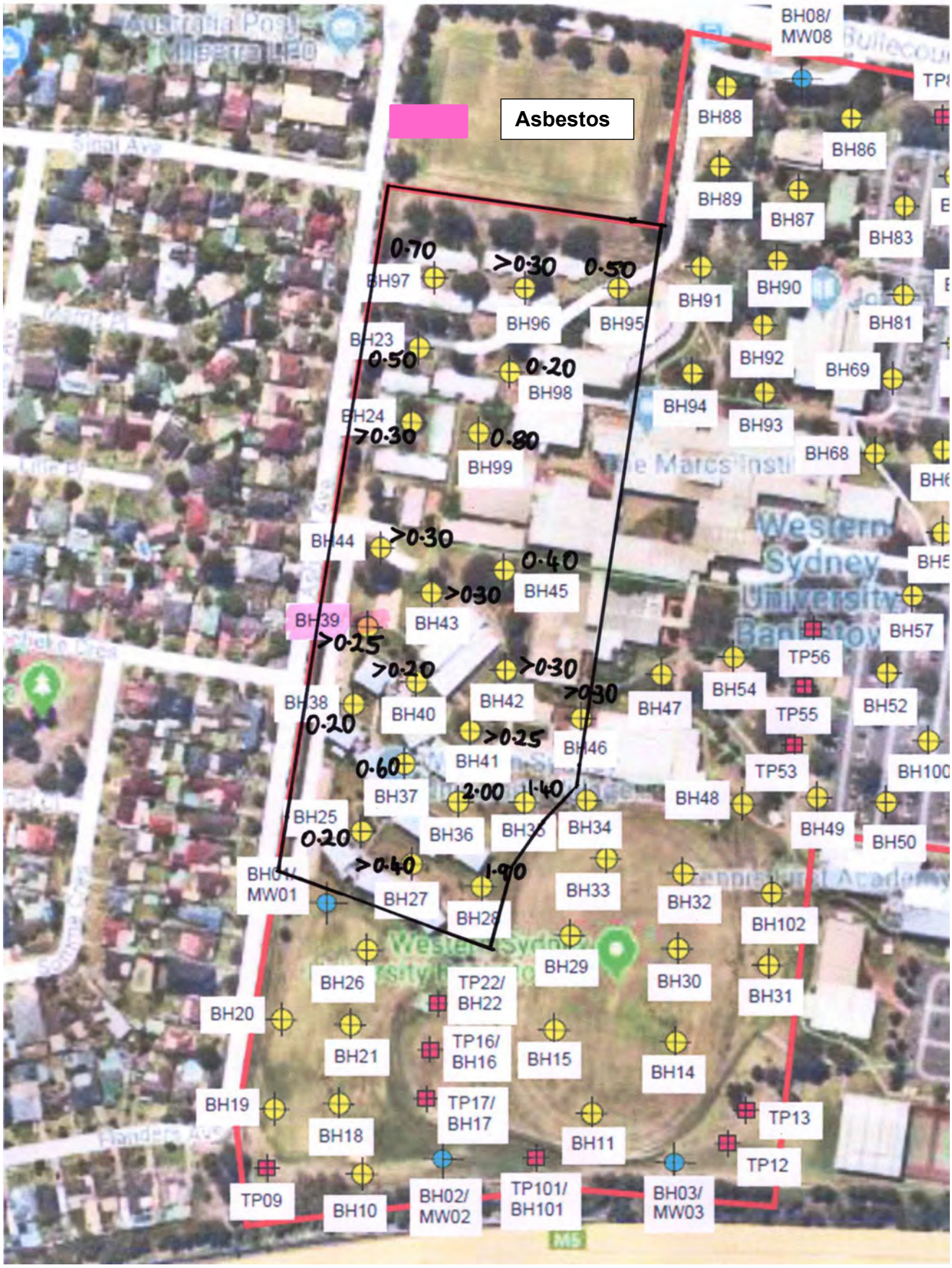


Figure 2-29 AEC01 Western Area Fill Thickness Data from SEG 2024 DSI (units: m)



AEC02 – Southern area

The depth of fill data provided by the 83 locations used to investigate the AEC02 southern area is summarised in **Figures 2-30** to **2-32**. The data showed the environmental consultants who investigated the southern area interpreted the stratigraphic conditions differently. All consultants recorded the presence of a clayey sand / sandy clay layer overlying a silty clay layer. However, the Coffey 2011 DSI and the Alliance 2020 DSI have described the deeper silty clay layer as natural soil, while the SEG 2024 DSI has generally described it as fill.

This discrepancy meant that the thickness of fill varied depending on the investigation used:

- The Coffey 2011 DSI borelogs showed the fill thickness at 0.35 - 1.80m;
- The Alliance 2020 DSI borelogs showed the fill thickness at 0.15 - >2.50m; and
- The SEG 2024 DSI borelogs defined the fill thickness at only 2 of the 52 test pits excavated.

Errors also occurred in the test pit logs produced by the SEG 2024 DSI, as shown by the logs for AEC02 TP39, which describes the deeper clay layer as both natural soil and fill, as shown in **Figure 2-33**.

These discrepancies are important because test pit logs provided by the SEG 2024 DSI recorded the presence of relatively deep fill layers containing visible asbestos below 0.8 and 1.0m, with the overlying fill described as containing no foreign materials. This type of stratigraphic profile was previously shown by the log for AEC02 TP39 and AEC02 TP35 (**Figure 2-34**).

The borelog data provided by the Alliance 2020 DSI also indicated the possible presence of a backfilled trench, possibly for a buried service, in the vicinity of BH02, TP16, TP17 and TP22 where the fill depth was recorded at 1.90 - >2.50m and the selected boreholes / test pits are aligned in a north-south direction.

The Site Auditor considered the uncertainties that remained in how the environmental consultants described the stratigraphic conditions at the AEC02 southern area needed to be addressed and accounted for by any remediation and subsequent bulk earthworks undertaken in the area. This is because such uncertainties may affect the quantity of remediation work needed to be undertaken to make the Site suitable for its intended land use and impact on the cost and timing of such work. This issue is further discussed in **Section 2.18**.

Figure 2-30 AEC02 Southern Area Fill Thickness Data from Coffey 2011 DSI (units: m)



Figure 2-31 AEC02 Southern Area Fill Thickness Data from Alliance 2020 DSI (units: m)

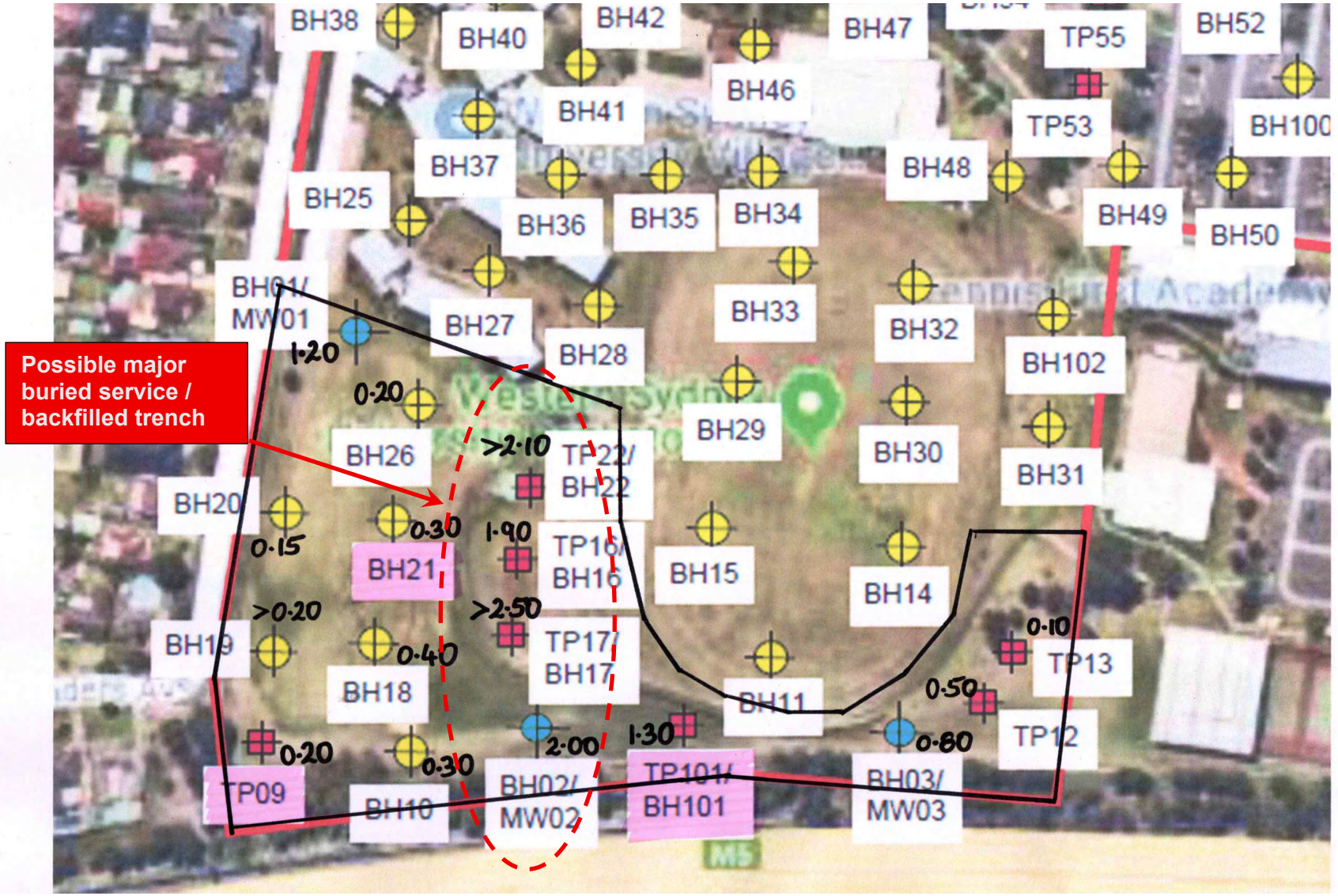


Figure 2-32 AEC02 Southern Area Fill Thickness Data from SEG 2024 DSI (units: m)



Figure 2-33 SEG 2024 DSI Log for Test Pit AEC02 TP39 (Source: Appn A, Ref [8])

Sydney Environmental

ENVIRONMENTAL TESTPIT AEC02 TP39

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP39-0.2-0.3		FILL	FILL: Claysy SAND with low organics, coarse grained, medium brown, dry-moist, trace gravel.	Foreign materials including geotextile fabric, plastic and metal observed.
0.3			FILL	FILL: CLAY, low plasticity, pale grey-brown, dry, trace sand.	
0.4					No contamination indicators observed.
0.5					
0.6					
0.7					
0.8					Foreign materials including potential Asbestos Containing Material (ACM) observed.
0.9					No contamination indicators observed.
1			FILL	NATURAL: CLAY, low plasticity, orange with grey-brown mottling, moist.	
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

Figure 2-34 SEG 2024 DSI Log for Test Pit AEC02 TP35 (Source: Appn A, Ref [8])

Sydney Environmental

ENVIRONMENTAL TESTPIT AEC02 TP35

PROJECT NUMBER 2300	**DATE** 12 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LM
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC02-TP35-0.2-0.3		FILL	FILL: Clayey Silty SAND, coarse grained, grey-orange, dry, with rocks.	
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1					
1.1	AEC02-TP35-1.2-1.3				Foreign materials including potential Asbestos Containing Material (ACM) observed.
1.2					No contamination indicators observed.
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	
1.5					
1.6					
1.7					
1.8					

AEC03 – Central area

The depth of fill data provided by the 73 locations used to investigate the AEC03 central area is summarised in **Figures 2-35** and **2-36**. The data showed that the fill thickness in the central area was variable probably due to past university developments, which ranged from 0.05 m to at least 2.5 m (TP85). Variations could occur in relatively short distances, which may be due to the presence of burial pits or buried services. Examples of possible asbestos burial pits where the entire logged fill profile was contaminated by visible asbestos were given in the Alliance 2020 DSI at TP56 and the SEG 2024 DSI at AEC03 TP68 shown in **Figures 2-37** and **2-38**, respectively.

For these reasons:

- It was unlikely that accurate estimates of the quantity of fill at AEC03 could be obtained; and
- There was a risk that asbestos contamination may remain at AEC03 if only a thin upper fill layer was removed.

The SEG 2024 DSI identified foreign materials in the fill at 35% (i.e. 18 of 52) of the locations investigated[21]. These foreign materials consisted mainly of B&D waste, which was a risk factor in terms of possible asbestos contamination.

The Site Auditor considered these stratigraphic conditions at AEC03 needed to be accounted for by any remediation and subsequent bulk earthworks undertaken in the area. This issue is further discussed in **Section 2.18**.

[21] Note: Data from the Alliance 2020 DSI was not considered because uncertainty remained with regard to the accuracy of the fill descriptions given in their borelogs.

Figure 2-35 AEC03 Central Area Fill Thickness Data from Alliance 2020 DSI (units: m)

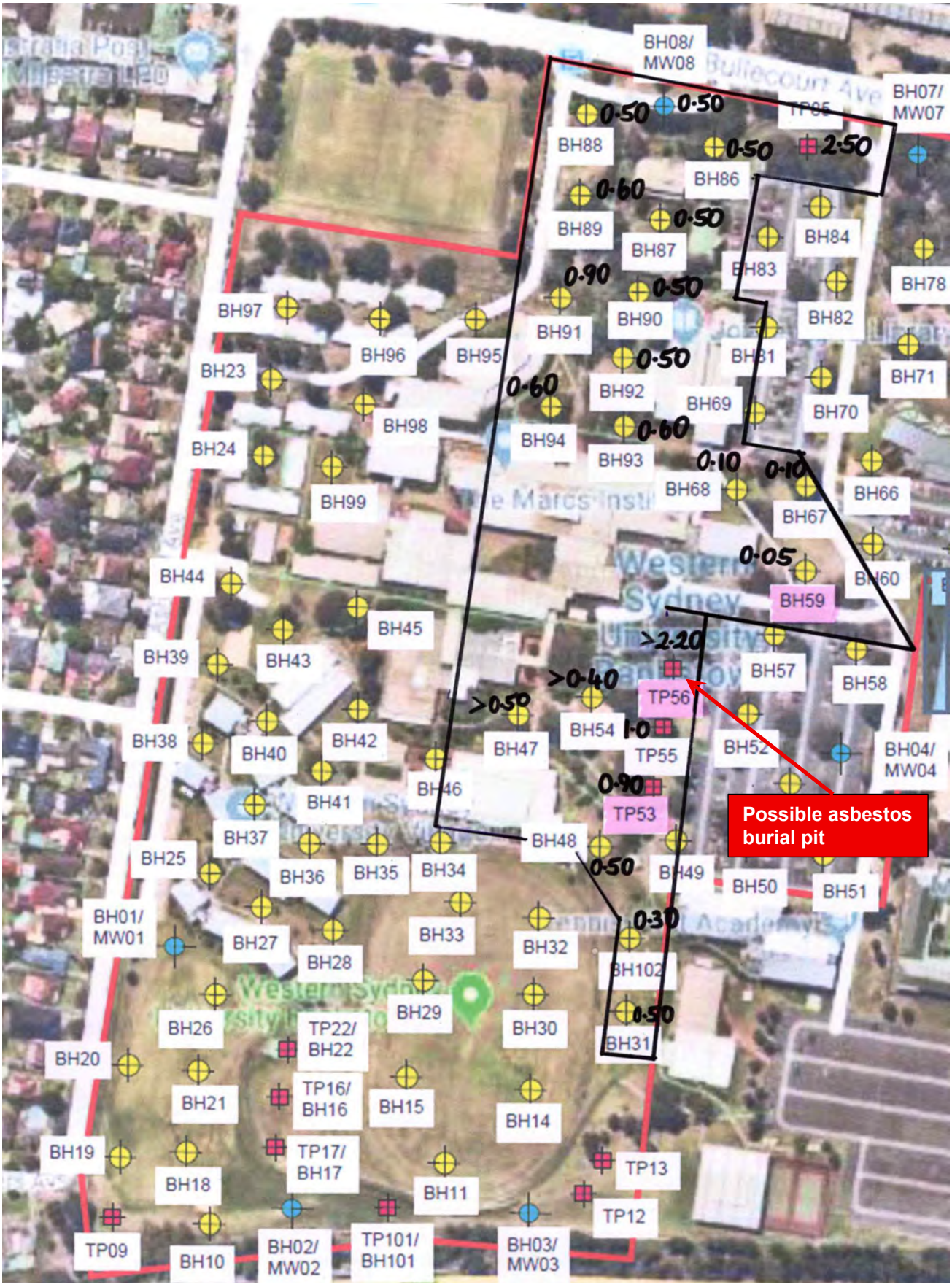


Figure 2-36 AEC03 Central Area Fill Thickness Data from SEG 2024 DSI (units: m)

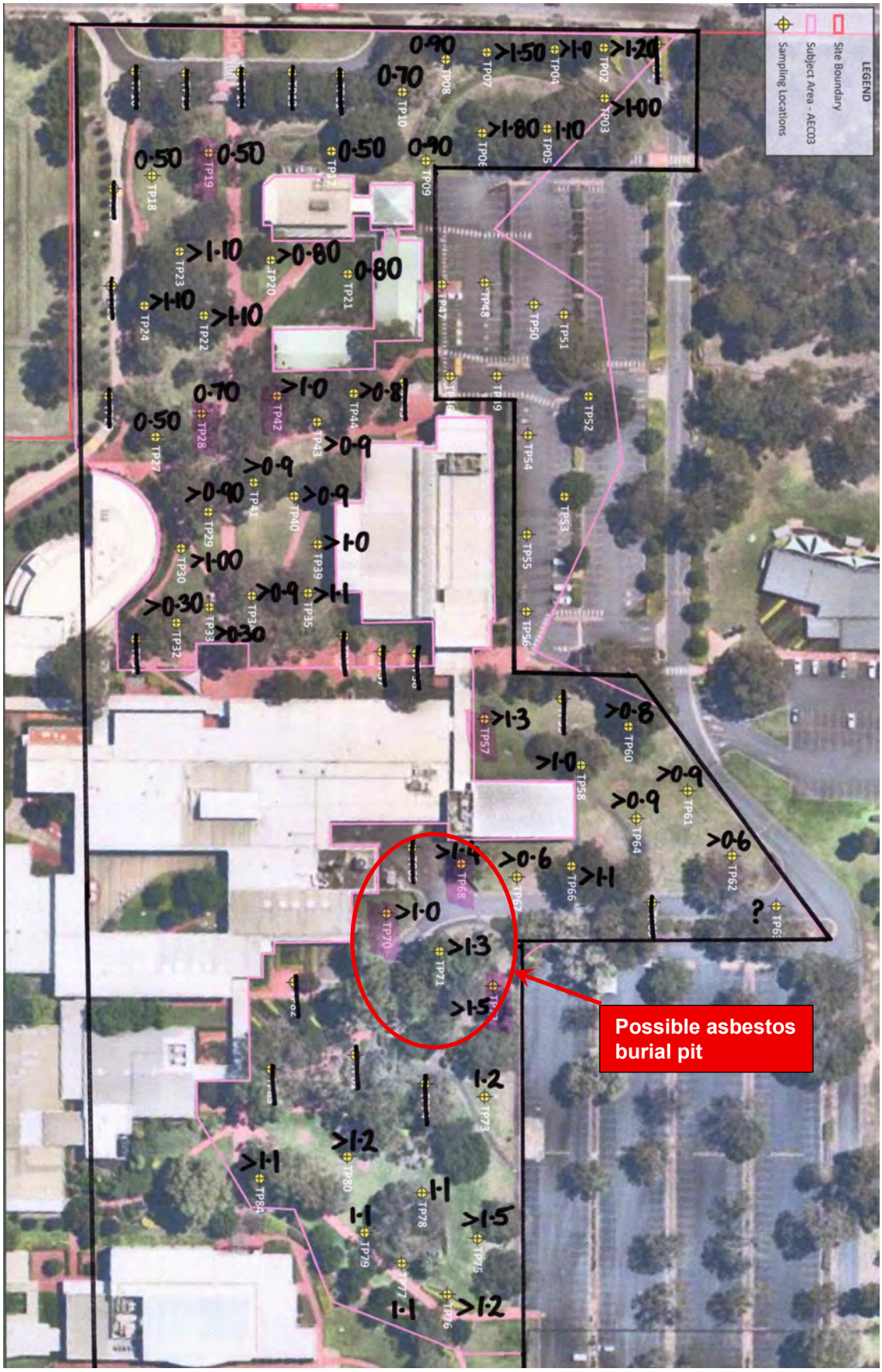


Figure 2-37 Alliance 2020 DSI Log for Test Pit TP56 (Source: Appn C, Ref [4])

alliance
geotechnical & environmental solutions

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TP No: TP56
Sheet: 1 of 1
Job No: 9996

Test Pit Log

Client: Mirvac Homes NSW PTY LTD
Project: Stage 2 Detailed Site Investigation
Location: WSU-Milperra Campus-2 Bullecourt Ave, NSW **Hole Location:** WSU - Milperra, NSW
Started: 16/12/2019
Finished: 16/12/2019
Test Pit Size: m

Rig Type: **Hole Coordinates** 3356.442E, 15059.491N **Driller:** **Logged:** SS/AW
RL Surface: m **Contractor:** Alliance Geotechnical **Bearing:** --- **Checked:**

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
E	NE		0.5		-	FILL: Silty CLAY, brown, with concrete gravels to cobbles, tile, sandstone boulders.	TP56 - 0.0 - 0.2	D	-	FILL ACM fragments noted throughout stratigraphy.
			1.0				TP56 - 0.9 - 1.1			
			1.5							
			2.0				TP56 - 1.8 - 2.0			
			2.5			Test Pit TP56 terminated at 2.2m				

Figure 2-38 SEG 2024 DSI Log for Test Pit AEC03 TP68 (Source: Appn A, Ref [8])

Sydney Environmental

ENVIRONMENTAL TESTPIT AEC03 TP68

PROJECT NUMBER 2300	**DATE** 10 January 2024	**LOGGED BY** LL
PROJECT NAME WSU Milperra DSI	**EXCAVATION CO.** Smartscan Locators	**CHECKED BY** LH
CLIENT Mirvac Group Pty Ltd	**OPERATOR** Tyler	
ADDRESS Western Sydney University, Milperra Campus	**EXCAVATION METHOD** 3.5 t Excavator	
	TOTAL DEPTH 1.4 m	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
0.1			FILL	FILL: Clayey SAND with high organics, coarse grained, medium brown, dry-moist.	No contamination indicators observed.
0.2	AEC03-TP68-0.2-0.3		FILL	FILL: Clayey SAND, fine grained, medium brown, dry.	Foreign materials including potential Asbestos Containing Material (ACM), glass, brick, metal, and cable were observed.
0.3					
0.4					
0.5			FILL	FILL: CLAY, high plasticity, orange with grey mottling, moist.	
0.6					
0.7					
0.8					
0.9					
1					
1.1					
1.2					
1.3					
1.4				Termination Depth at: 1.4 m on compacted fill	

AEC05 – Building footprints (post-demolition)

The depth of fill data provided by the 46 locations used to investigate the AEC05 building footprints is summarised in **Figure 2-39**. The data showed that the fill thickness across building footprints was similar to that found outside building footprints at AEC01 and AEC03. The fill thickness was variable probably due to past university developments, which ranged from 0.5 m to at least 3.0 m (AEC05 TP18 & TP28). Variations could occur in relatively short distances, which may be due to the presence of burial pits or buried services.

For these reasons:

- It was unlikely that accurate estimates of the quantity of fill at AEC05 could be obtained; and
- There was a risk that asbestos contamination may remain at AEC05 if only a thin upper fill layer was removed.

The EGA 2025 DSI identified foreign materials in the fill at 89% (i.e. 41 of 46) of the locations investigated. These foreign materials consisted mainly of B&D waste, which was a risk factor in terms of possible asbestos contamination.

The Site Auditor considered these stratigraphic conditions at AEC05 needed to be accounted for by any remediation and subsequent bulk earthworks undertaken in the area. This issue is further discussed in **Section 2.18**.

AEC09a – Southern sports field

The depth of fill data provided by the 9 locations used to investigate the AEC09a sports field is summarised in **Figure 2-40**. The data showed that the fill thickness across sports field was shallow and relatively uniform, ranging between 0.20 and 0.50 m. The relatively shallow fill thickness and the absence of foreign materials indicated that the sports field was constructed by excavating into the natural soils, following by the spreading of a thin topsoil layer.

The Site Auditor considered these stratigraphic conditions when reviewing the soil contamination assessment in **Section 2.13**.

AEC09b – Carparks and main roadway

The depth of fill data provided by the 17 locations used to investigate the AEC09b carparks and main roadway is summarised in **Figure 2-41**. The data showed that a fill layer was not present under the asphalt road pavement across the majority of the area (13 of 17 locations or 76%). Where fill was present, it was shallow generally at 0.10 – 0.20 m, with the maximum fill thickness of 0.50m (BH81). No foreign materials were recorded as having been in the fill.

The stratigraphic data indicated that the asphalt carparks and main roadway were generally constructed by stripping away natural topsoils to the natural clay layer followed by placing the asphalt pavement. The Site Auditor considered these stratigraphic conditions when reviewing the soil contamination assessment in **Section 2.13**.

Figure 2-39 AEC05 Building Footprint Fill Thickness Data from EGA 2025 DSI (units: m)

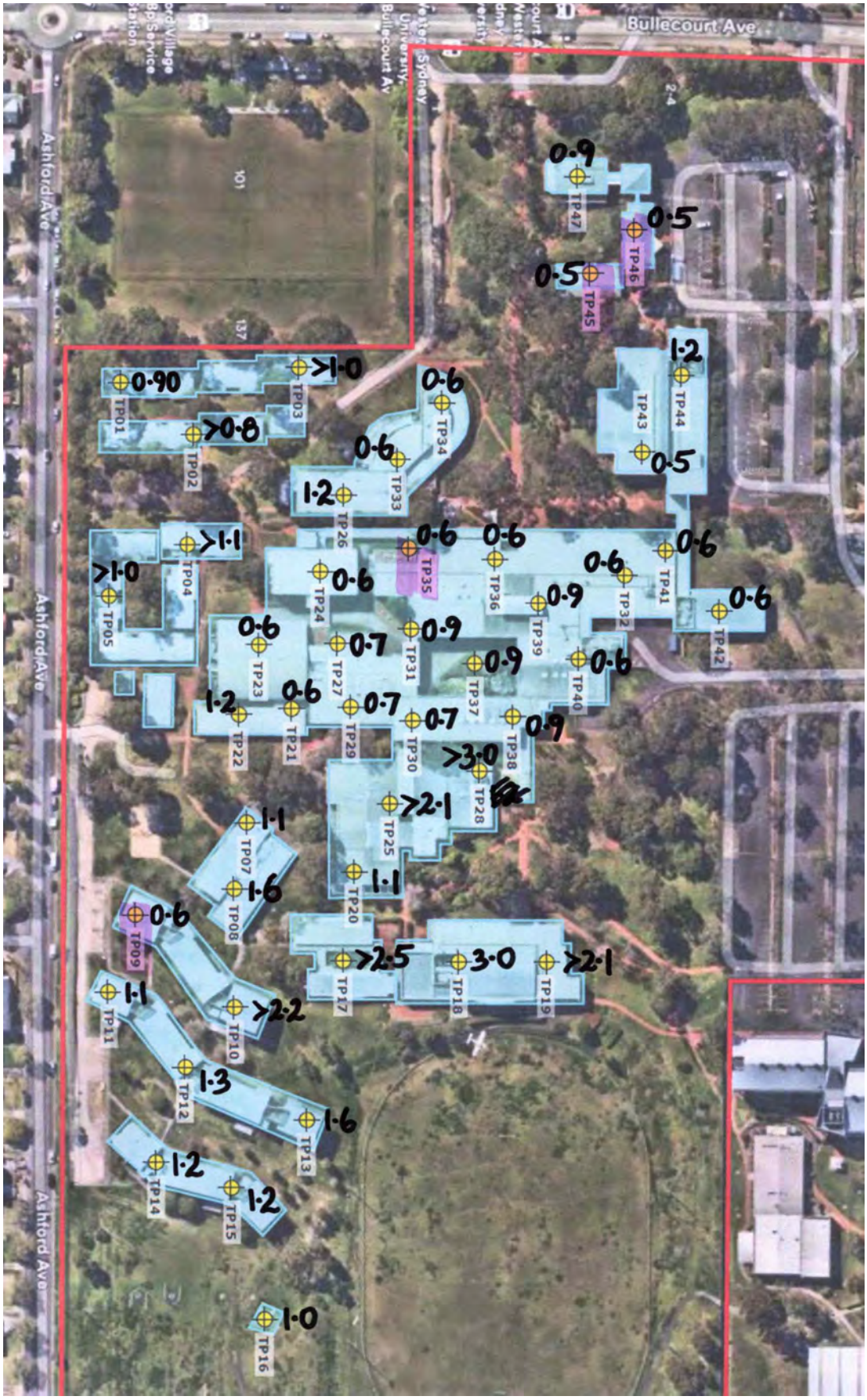


Figure 2-40 AEC09a Sports Field Fill Thickness Data from Alliance 2020 DSI (units: m)

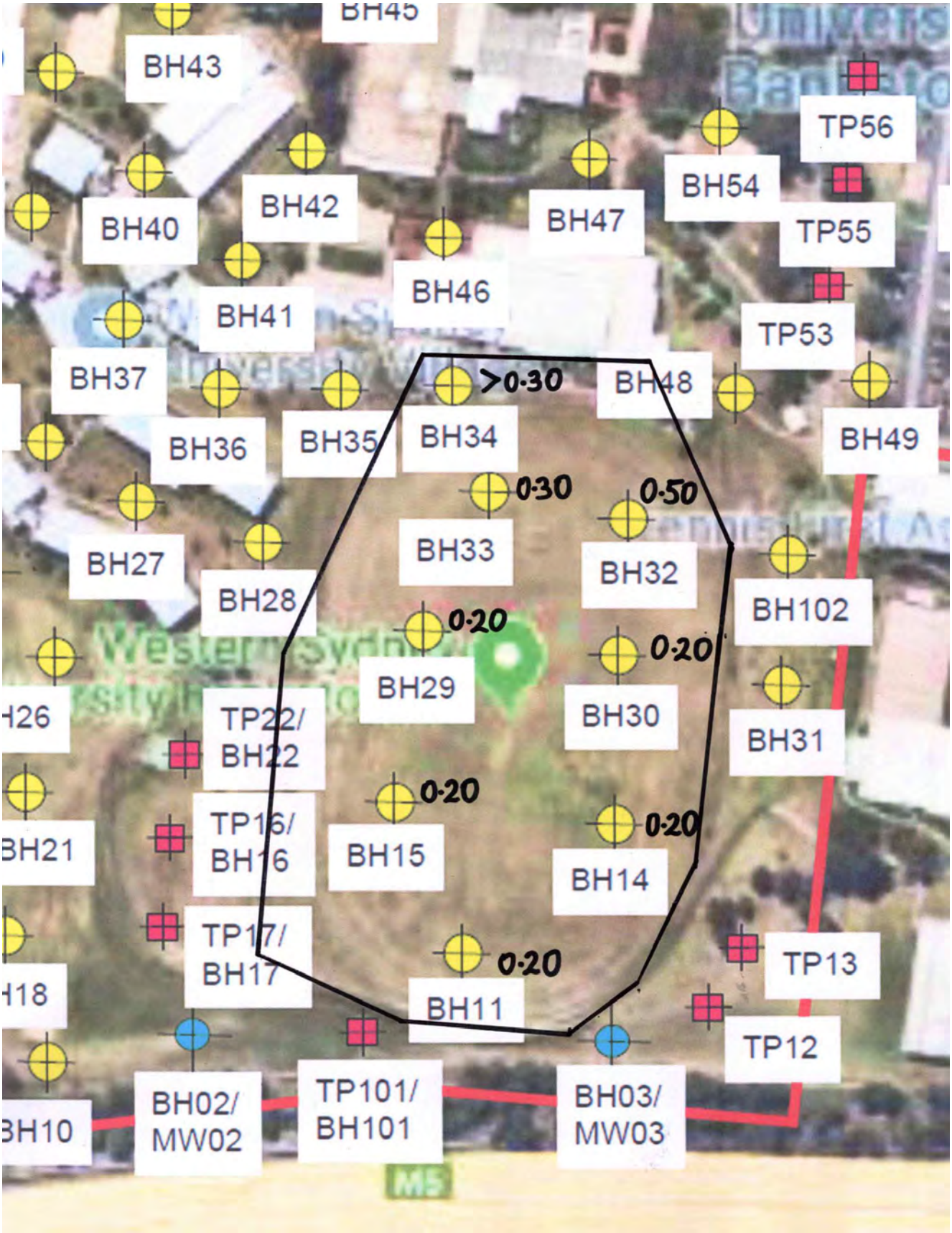


Figure 2-41 AEC09b Carparks / Main Road Fill Thickness Data from Alliance 2020 DSI (units: m)



2.12 Background Contaminant Levels

The sixth check in the EPA decision process was that '*any issues relating to local area background soil concentrations that exceed relevant investigation levels have been adequately addressed in the site assessment report(s).'*

The ESAs provided no assessment of background contaminant levels in soils. The Site Auditor addressed this risk by reviewing the available data, which indicated that there would be no issues relating to local area background soil concentrations at the Site because:

- The ESAs collected a reasonable number of natural soil samples at the Site that were tested for the COPCs, comprising heavy metals (42), TRH / BTEX / PAHs (38), OCPs (19), OPPs / PCBs (14);
- The ESAs found no physical evidence of contamination in natural soils at the Site; and
- The results showed the natural soils in the area had a quality consistent with typical Australia soils as given by the NEPM (1999) guidelines. In particular, metal concentrations were below the HIL A and EIL criteria, and the other substances (PAHs, TRH, BTEX, PCBs, OCPs, OPPs) were all at non-detectible concentrations.

The Site Auditor concluded that any elevated concentration of a COPC in soil at the Site was due to anthropogenic contamination that needed to be considered in the risk assessment.

2.13 Soil Contamination

The third check in the EPA decision process was that '*soils have been assessed against relevant health-based investigation levels and potential for migration of contamination from soils to groundwater has been considered*'.

The EGA 2025 DSI[22] advised that after buildings had been demolished, shallow soils were excavated from across the Site and placed in stockpiles located around the Site. Because of the disturbance of soils caused by this work, the Site Auditor has initially reviewed the contamination data obtained prior to the commencement of demolition work sub-divided into the various AECs adopted by the CSM (**Section 2.5.1**). A review of the available data on the soils that were excavated and placed in stockpiled around the Site are then reviewed.

2.13.1 Risk of Widespread Chemical Contamination

The Site Auditor considered the weight of evidence supported the conclusion that there was a low risk of widespread chemical contamination at the Site. This is because:

- The data provided by the COPCs was close to meeting the DQOs for the reasons given in **Sections 2.7** to **2.10**;
- The ESAs found no physical evidence of significant odorous or stained soil;
- The bulk of sample data was collected between 2020 and 2025, with none of these samples measuring chemical concentrations above HIL A criteria; and

[22] Sections 14.4.6 & 15.1, Ref [11]

- The sample data collected between 2020 and 2025 measured few exceedances of the EILs, with only marginal exceedances at isolated locations that did not represent hot-spots needing to be remediated.

The main chemical contamination risks that remained in 2025 were associated with possible localised contamination at:

- The former child care centre at AEC01a, which is reviewed in **Section 2.13.3**;
- The former UST area at AEC04, which is reviewed in **Section 2.13.6**; and
- Buried services & abandoned septic tanks (AEC08), which is reviewed in **Section 2.13.8**.

The data provided by the ESAs showed that the main contamination risk at the Site was due to asbestos contamination buried in fill.

2.13.2 AEC01 – Contaminated Fill Outside Western Area Building Footprints

Bonded Asbestos

The EGA 2025 DSI[23] advised that bonded asbestos:

- Was not measured within practically all lab tested soil samples above the PQL of 0.01 %w/w within AEC01. The one exception was sample AEC01-TP23-0.2-0.3 at 0.058 %w/w;
- Was measured in a gravimetric bulk field test conducted on sample AEC01-TP17-0.2-0.3 at a concentration of 0.033 %w/w that exceeded HIL A (0.01 %w/w); and
- Was observed within shallow fill at other sample locations.

The Site Auditor considered the weight of evidence supported the conclusion that bonded asbestos was present in fill outside building footprints in the western area of the Site. This is because of the data described above and presented in **Table 2-16**, which showed:

- Foreign materials that included B&D waste were observed at 8 sample locations;
- Visible asbestos was observed in fill at 5 sample locations; and
- Asbestos was detected in fill at 8 sample locations.

The EGA 2025 DSI[24] estimated that the extent of bonded asbestos contamination within AEC01 covered 3,950 m^2 to an average depth of 0.5 mbgl giving a volume of 1,975 m^3 (in-situ). The extent of this contamination is shown by yellow shading in **Figure 2-42**.

[23] Section 14.1.1, Ref [11]
[24] Sections 14.1 & 15.1, Ref [11]

Figure 2-42 EGA Extent of Asbestos Contamination at AEC01 (Source: Fig 7, Ref [11])



The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of bonded asbestos contamination at AEC01 estimated by EGA probably represented a lower bound estimate because:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling / excavation work;
- The inherent limitations of discrete sampling methods;
- The presence of asbestos in fill at AEC01 as reported by the ESAs; and
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC01 was 0.5 m (EBH1) but the maximum depth was at least 1.40m (TP17).

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

Friable Asbestos

The EGA 2025 DSI[25] advised that friable asbestos was measured in the soil samples in two samples but at concentrations below the PQL and adopted health screening level (0.001 % w/w). The Site Auditor considered this finding made by EGA was in error because samples SS10 and BH39 measure friable asbestos at 0.019 %w/w and 0.043 %w/w, respectively.

The EGA 2025 DSI[26] estimated that friable asbestos contamination >0.001 %w/w within AEC01 was found at 6 sample locations (EBH1 - EBH3, EBH5, SS10, BH39), with the extent of contamination at each location limited to a 5 x 5m area and 0.5 m deep on average giving a volume of 75 m^3 (in-situ). The extent of this contamination is shown by pink coloured squares in **Figure 2-42**.

The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of friable asbestos contamination at AEC01 estimated by EGA probably represented a lower bound estimate because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: absence of some test pit logs, errors in some borehole/test pit logs, and insufficient sample size for lab samples being tested for friable asbestos;
- The inherent limitations of discrete sampling methods;
- Friable asbestos was found at a high proportion of sample locations at AEC01;
- It was unlikely that the extent of friable asbestos at AEC01 was limited to a 5x5m area at the six locations where it was found; and
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC01 was 0.5 m (EBH1) but the maximum depth was at least 1.40m (TP17).

[25] Section 14.1.1, Ref [11]
[26] Sections 14.1 & 15.1, Ref [11]

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

2.13.3 AEC1a – Surface Soils & Fill at Former Childcare Centre Footprint

The EGA 2025 DSI[27] estimated that the extent of heavy metal contamination in fill at the former childcare centre was a 1,000 m^2 area to a depth of 0.25 m giving a volume of 250 m^3 (in-situ). The extent of this contamination is shown by yellow shading in **Figure 2-43**.

Figure 2-43 EGA Extent of Heavy Metal Contamination at AEC01a (Source: Fig 11, Ref [11])



The Site Auditor considered there was insufficient data to support a conclusion regarding the presence and extent of heavy metal contamination at the former child care centre because the available data was obtained in 2011 prior to construction of the child care centre, with it possible that the contamination was removed prior to construction. Further investigation needed to be undertaken following demolition of the building in order to determine if contamination remained that needed to be remediated.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

[27] Section 15.1, Ref [11]

2.13.4 AEC02 – Contaminated Fill at Southern Area (excl. sports field)

Bonded Asbestos

The EGA 2025 DSI[28] advised that bonded asbestos:

- Was not measured within lab tested soil samples above the PQL of 0.01 %w/w within AEC02. However, bonded asbestos was observed within shallow fill at some sample locations.
- Was measured in gravimetric bulk field tests conducted on 6 of 7 samples at concentrations that exceeded HIL A (0.01 %w/w); and
- Was observed within shallow fill at other sample locations.

The Site Auditor considered the weight of evidence supported the conclusion that bonded asbestos was present in fill at the southern area of the Site. This is because of the data presented above and in **Table 2-16**, which showed:

- Foreign materials that included B&D waste were observed at 29 sample locations;
- Visible asbestos was recorded at the ground surface at two sample locations (TP09, TP101/BH101);
- Visible asbestos was observed in fill at 15 sample locations; and
- Asbestos was detected in fill at 15 sample locations.

The EGA 2025 DSI[29] estimated that the extent of bonded asbestos contamination within AEC02 covered 10,425 m^2 to an average depth of 0.5 mbgl giving a volume of 5,212 m^3 (in-situ). The extent of this contamination is shown by blue shading in **Figure 2-44**.

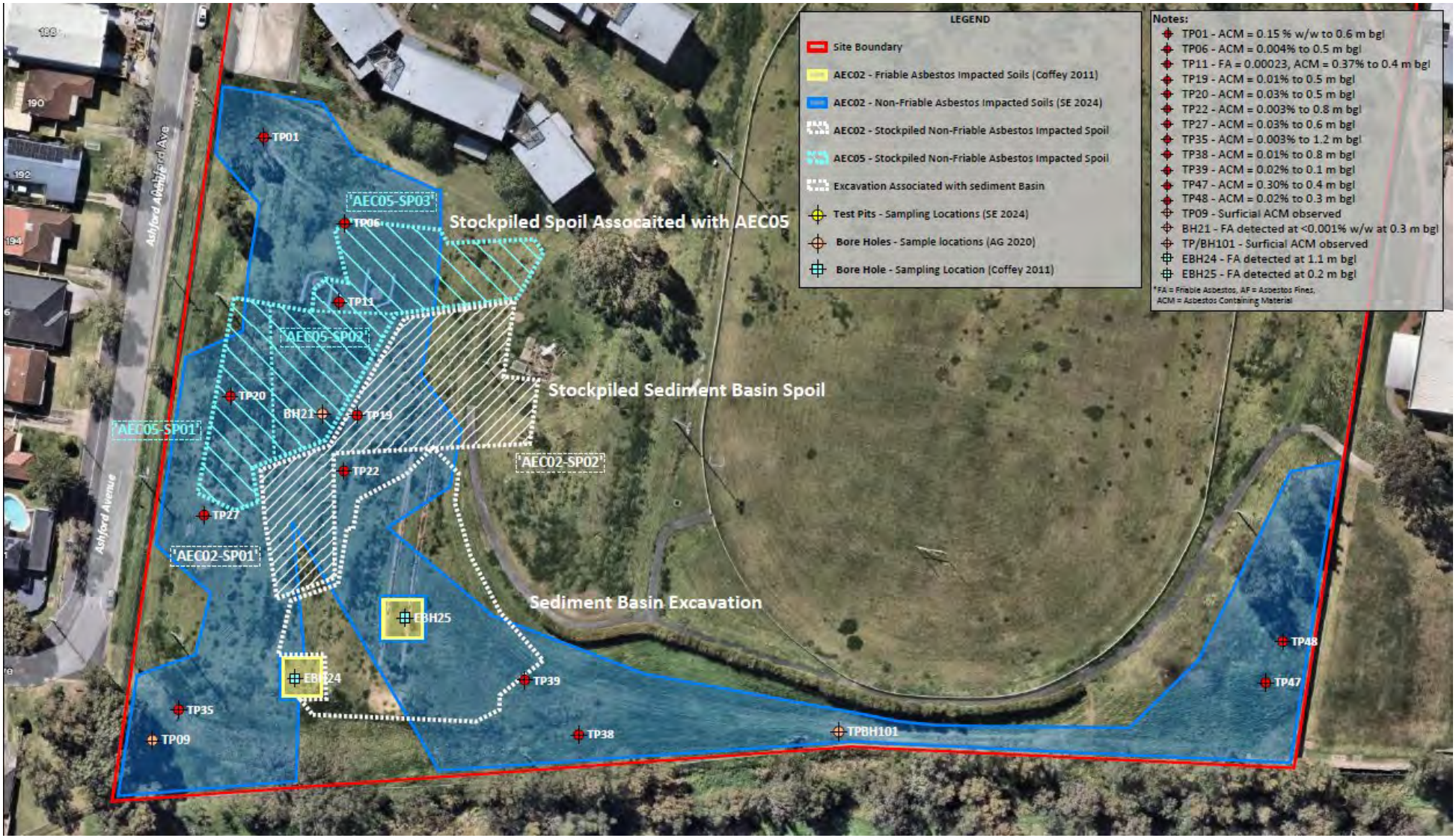
The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of bonded asbestos contamination at AEC02 estimated by EGA probably represented a lower bound estimate because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling / excavation work;
- The inherent limitations of discrete sampling methods;
- The presence of asbestos in fill at AEC02 as reported by the ESAs; and
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC02 was >0.70 m (TP12) but the maximum depth was at least 1.70m (TP48).

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

[28] Section 14.2.1, Ref [11]
[29] Sections 14.2 & 15.1, Ref [11]

Figure 2-44 EGA Extent of Asbestos Contamination at AEC02 (Source: Fig 8, Ref [11])



Friable Asbestos

The EGA 2025 DSI[30] advised that friable asbestos was measured in the soil samples in one sample but at a concentration below the PQL and adopted health screening level (0.001 % w/w). However, friable asbestos contamination within AEC02 was detected at two other sample locations (EBH24, EBH25). The EGA 2025 DSI estimated the extent of contamination at each location was limited to a 5 x 5m area and 0.5 m deep giving a total volume of 25 m^3 (in-situ). The extent of this contamination is shown by yellow coloured squares in **Figure 2-44**.

The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of friable asbestos contamination at AEC02 estimated by EGA probably represented a lower bound estimate because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: absence of some test pit logs, errors in some borehole/test pit logs, and insufficient sample size for lab samples being tested for friable asbestos;
- The inherent limitations of discrete sampling methods;
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC02 was >0.70 m (TP12) but the maximum depth was at least 1.70m (TP48);
- It was unlikely that the extent of friable asbestos at AEC02 was limited to a 5x5m area at the six locations where it was found; and
- The EGA 2025 DSI[31] advised that the friable asbestos contamination at EBH24 and EBH25 was excavated and disposed off-site as part of work to construct a sediment basin in the area, as shown in **Figure 2-44**. EGA advised that 200 m^3 of friable asbestos contaminated soil was excavated and disposed off-site from these two areas, which was four times the volume predicted by EGA.

The Site Auditor also considered the data provided by the EGA 2025 DSI on the removal of friable asbestos contaminated soil from EBH24 and EBH25 did not meet the documentation completeness DQO because of the following data gaps:

- A description of how sample locations EBH24 and EBH25 were relocated and the soils excavated, transported and disposed off-site;
- Descriptions and photos of subsurface conditions revealed by the excavations;
- A waste classification report;
- Material tracking data;
- Waste tip dockets; and
- Validation data for the excavation.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

[30] Section 14.2.1, Ref [11]
[31] Section 14.2.2 & Appendix E, Ref [11]

2.13.5 AEC03 – Contaminated Fill Outside Building Footprints in Central Area

Bonded Asbestos

The EGA 2025 DSI[32] advised that bonded asbestos:

- Was not measured within any soil sample above the PQL of 0.01 %w/w within AEC03;
- Was measured in gravimetric bulk field tests conducted on 6 of 7 samples at concentrations that exceeded HIL A (0.01 %w/w); and
- Was observed within shallow fill at some sample locations.

The Site Auditor considered the weight of evidence supported the conclusion that bonded asbestos was present in fill outside building footprints in the central area of the Site. This is because of the data presented above and in **Table 2-16**, which showed:

- Foreign materials that included B&D waste were observed at 21 sample locations;
- Visible asbestos was recorded at the ground surface at one sample location (BH59);
- Visible asbestos was observed in fill at 9 sample locations; and
- Asbestos was detected in fill at 7 sample locations.

The EGA 2025 DSI[33] estimated that the extent of bonded asbestos contamination within AEC03 covered 1,185 m^2 to an average depth of 0.6 mbgl giving a volume of 9,288 m^3 (in-situ). The extent of this contamination is shown by blue shading in **Figure 2-45**.

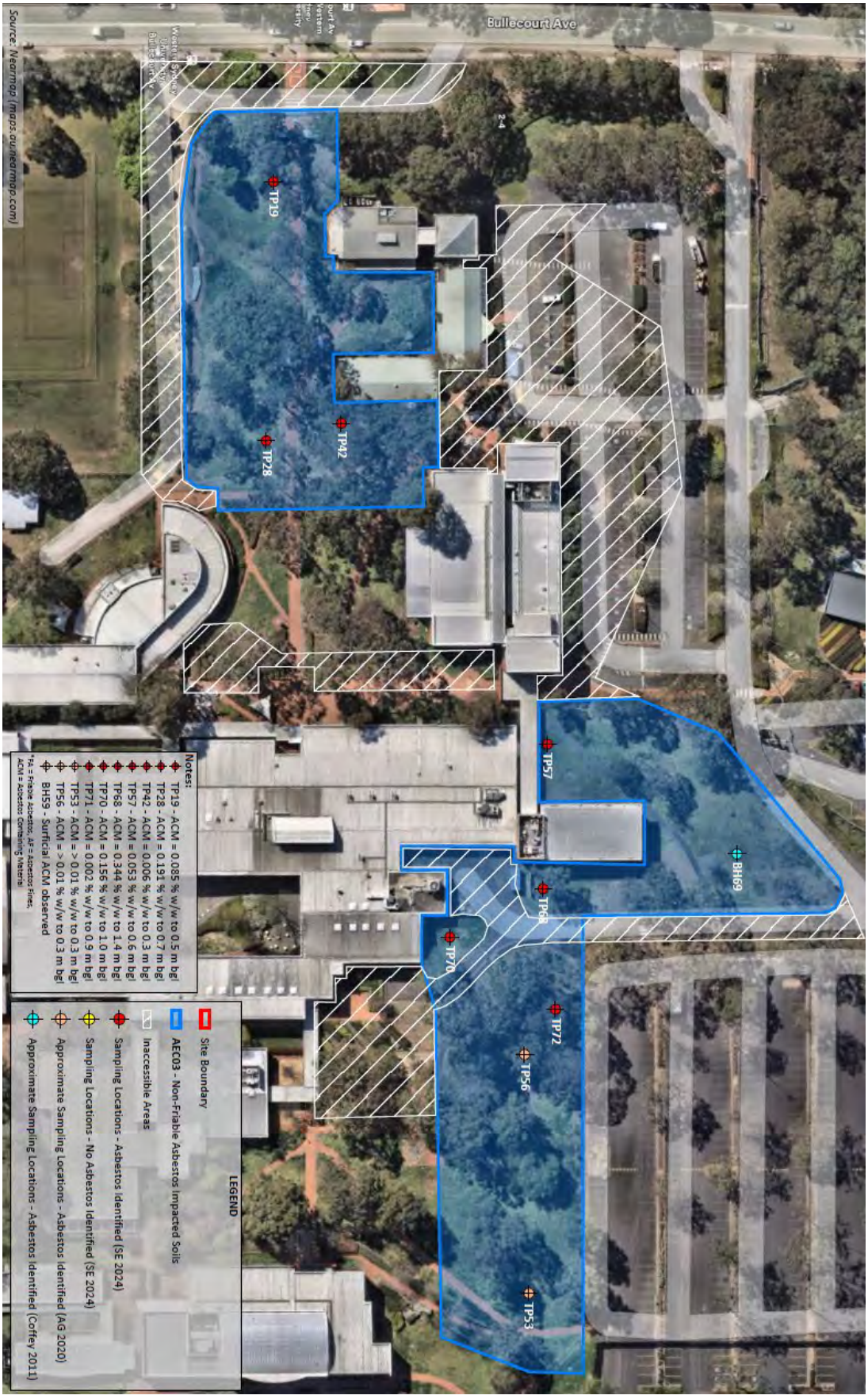
The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of bonded asbestos contamination at AEC03 estimated by EGA probably represented a lower bound estimate because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling / excavation work;
- The inherent limitations of discrete sampling methods; and
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC03 was 0.5 m (TP19) but the maximum depth was at least 1.50m (TP72).

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

[32] Section 14.3.1, Ref [11]
[33] Sections 14.3 & 15.1, Ref [11] – Note: Table 15.1.2 gives the average depth of asbestos contaminated soil as 0.6m, whereas Section 14.3.2 gives the average depth as 0.5 m.

Figure 2-45 EGA Extent of Asbestos Contamination at AEC03 (Source: Fig 9, Ref [11])



Friable Asbestos

The EGA 2025 DSI[34] advised that friable asbestos was not detected within any soil sample within AEC03 and considered there was a low risk of friable asbestos at AEC03 needing to be remediated. The Site Auditor considered there was a risk that friable asbestos may be present at AEC03 because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: absence of some test pit logs, errors in some borehole/test pit logs, and insufficient sample size for lab samples being tested for friable asbestos;
- The inherent limitations of discrete sampling methods; and
- The presence of friable asbestos at other AECs.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

2.13.6 AEC04 – Former UST Area

The EGA 2025 DSI[35] advised that the presence and extent of petroleum hydrocarbon contamination at the former UST area needed to be investigated and confirmed. The Site Auditor considered the available data supported this conclusion because:

- The USTs had been removed 28 years ago in 1997, with there being a long period for residual petroleum hydrocarbon contamination to degrade;
- The nearby investigations found no evidence of petroleum hydrocarbons, odorous or stained soil in the surrounding area; and
- The groundwater investigations found no evidence of petroleum hydrocarbon contaminated groundwater at the Site.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

2.13.7 AEC05 – Contaminated Fill at Building Footprints (Post-Demolition)

Bonded Asbestos

The EGA 2025 DSI[36] advised that bonded asbestos:

- Was not measured by lab tested soil samples above the PQL of 0.01 %w/w within AEC05;
- Was observed within shallow fill at three sample locations; and
- Was observed during demolition work at the footprints of Buildings 1, 5 and 10.

[34] Section 14.3.1 & 15.1, Ref [11]
[35] Section 15.1, Ref [11]
[36] Sections 11.5, 14.4.2 & 14.4.6, Ref [11]

The Site Auditor considered the weight of evidence supported the conclusion that bonded asbestos was present in fill at building footprints. This is because of the data described above and presented in **Table 2-16**, which showed:

- Foreign materials that included B&D waste were observed at 41 of 46 sample locations;
- Visible asbestos was recorded at the ground surface at four sample locations;
- Visible asbestos was observed in fill at one sample location (AEC05 TP09); and
- Asbestos was detected in fill at 8 sample locations.

The EGA 2025 DSI[37] estimated that bonded asbestos contaminated fill remained at some of the building footprints, with the extent of this contamination shown by blue shading in **Figure 2-46**. The extent of bonded asbestos contamination within AEC05 covered 14,050 m^2 to an average depth of 0.6 mbgl giving a volume of 8,430 m^3 (in-situ).

The Site Auditor considered the weight of evidence supported the conclusion that the location and extent of bonded asbestos contamination at AEC05 estimated by EGA probably represented a lower bound estimate because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling / excavation work;
- No bulk gravimetric tests were reported to have been conducted;
- The inherent limitations of discrete sampling methods; and
- The disturbance of soils following demolition work and the lack of data showing how this work was undertaken. These data gaps included details on the locations where soils were scraped, how the soils were scraped, transported and stockpiled.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

[37] Sections 14.4.6 & 15.1, Ref [11]

Figure 2-46 Asbestos Contamination at AEC05 Building Footprints (Source: Fig 10, Ref [11])



Friable Asbestos

The EGA 2025 DSI[38] advised that friable asbestos was not detected within any soil sample within AEC05 and considered there was a low risk of friable asbestos at AEC05 needing to be remediated. The Site Auditor considered there was a risk that friable asbestos may be present at AEC05 because of:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025 (**Sections 2.7 – 2.10**), which included: absence of some test pit logs, errors in some borehole/test pit logs, and insufficient sample size for lab samples being tested for friable asbestos;
- The inherent limitations of discrete sampling methods; and
- The presence of friable asbestos at other AECs.

This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

2.13.8 AEC08 – Buried Services & Abandoned Septic Tanks

The EGA 2025 DSI identified the contamination risks posed by buried services and abandoned septic tanks at the Site and included this risk in the CSM. However, the presence, location and nature of this form of contamination was not investigated.

The Site Auditor considered that it was impractical for ESAs to try and define the risks posed by this form of contamination and considered that it was reasonable to address this risk during bulk earthworks undertaken at the Site during both remediation and civil work. This limitation in the contamination assessment provided by the ESAs is further considered in **Section 2.18**.

2.13.9 AEC09(a) - Surface Soils & Fill at Southern Sports Field

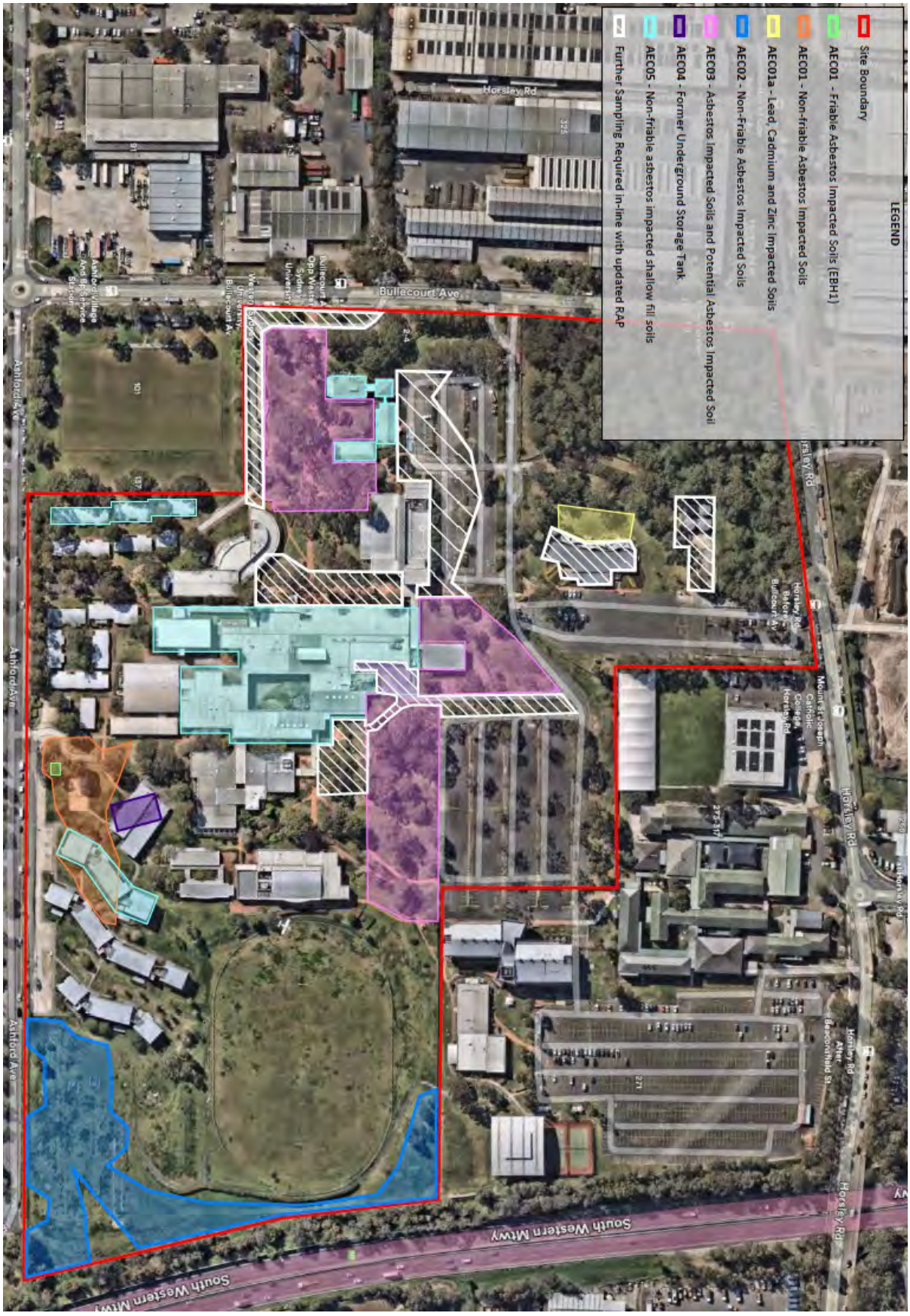
The ESAs considered there was a low risk of soil contamination in the southern sports field needing to be remediated and did not consider this was an AEC. The EGA 2025 DSI also considered that no further investigations were required in this area, as shown by **Figure 2-47**.

The Site Auditor considered the weight of evidence supported this conclusion because:

- The historical data did not identify any activity have occurred that posed a contamination risk to the area;
- The stratigraphic data indicated that the sports field was constructed by excavating natural soils and then covering the area with topsoil;
- The data provided for this area was close to meeting the DQOs;
- The Alliance 2020 boreholes found no physical evidence of contamination; and
- Soil samples did not measure the COPCs above normal background levels.

[38] Section 14.4.2 & 15.1, Ref [11]

Figure 2-47 EGA 2025 DSI Revised CSM (Source: Fig 11, Ref [11])



The Site Auditor considered this area of the Site did not require further investigation to assess soil contamination risks unless the area was used to stockpile and/or treat asbestos contaminated soil. This risk is considered further when reviewing the RAP in **Section 4**.

2.13.10 AEC09(b) Carparks & Main Roadway

The ESAs considered there was a low risk of soil contamination in most of the area occupied by carparks and the main roadway and did not consider this was an AEC. The EGA 2025 DSI also considered that no further investigations were required across much of this area, as shown by **Figure 2-47**. However, some investigation was recommended in the northern carpark.

The Site Auditor considered the weight of evidence supported this conclusion because:

- The stratigraphic data indicated that the carparks and main roadway was constructed either directly on natural soils or with fill containing no physical evidence of foreign materials;
- The data provided for this area was close to meeting the DQOs;
- The Alliance 2020 boreholes found no physical evidence of contamination; and
- Soil samples did not measure the COPCs above normal background levels.

The Site Auditor considered that the risk of contamination being found in this area could be managed as part of bulk earthworks undertaken for the remediation and civil works. This risk is considered further when reviewing the RAP in **Section 4**.

2.13.11 AEC09(c) Northern Conservation Reserve

The ESAs considered there was a low risk of soil contamination in the Northern Conservation Area and did not consider this was an AEC. The EGA 2025 DSI also considered that no further investigations were required across this area, as shown by **Figure 2-47**.

The Site Auditor considered the weight of evidence supported this conclusion because the historical data did not identify any activity have occurred that posed a contamination risk to the area. However, the Site Auditor considered there was a risk of fly tipping of rubbish and waste in the area that, if present, would need to be removed as part of the remediation work. This risk is considered further when reviewing the RAP in **Section 4**.

2.13.12 Stripping and Stockpiling of Surface Soils

The EGA 2025 Demolition Clearance Report[39] advised that to manage the risk of cross contaminating building waste with asbestos impacted soil during demolition work, soils around the perimeter of on-site structures were excavated back until soils free of visible fibre cement fragments were encountered. Spoil generated during this work was stockpiled atop a geofabric marker, with geofabric then placed over the stockpiled soil to prevent wind erosion / generation of dust. Stockpiles were located in areas of the Site unlikely to be disturbed as part of the proposed demolition work. All loads were covered during transport. At the completion of demolition works all internal roadways and transit routes were subject to visual inspection, with evidence of cross contamination or spread of asbestos containing materials during transport was not observed.

[39] Section 1.6, Ref [10]

The Site Auditor considered that the weight of evidence supports the conclusion that surface soils around building footprints were unlikely to have been stripped to manage the risk of cross contaminating building waste with asbestos impacted soil during demolition work. This is because:

- Practically no evidence of visible asbestos at the ground surface was identified by the ESAs. The data summarised in **Table 2-16** shows that of the 347 sample locations, visible asbestos at the ground surface was identified at only 7 locations, with few if any of these locations situated near buildings;
- The data provided by the ESAs showed that fill impacted by asbestos was located around buildings at a much greater frequency than found at the ground surface, as shown by the areas of asbestos contaminated soil needing to be remediated at AEC01 (**Figure 2-24**) and AEC03 (**Figure 2-45**). This meant that stripping off surface soils had the potential to expose the underlying asbestos contaminated fill, thereby causing a bigger risk in terms of cross-contamination of B&D waste;
- The demolition contractor and environmental consultant did not advise the Site Auditor of a problem with visible asbestos at the ground surface at proposed demolition areas when the Site was inspected on 21/10/24 and 6/02/25; and
- The Site Auditor found no evidence of visible asbestos at the ground surface when inspecting the Site on 21/10/24 and 6/02/25.

Following the completion of demolition work at a building, the EGA 2025 DSI[40] advised that excavation work was undertaken at selected building footprints to remove asbestos impacted fill and in the SW corner of the Site to construct a stormwater retention basin. However, the Site Auditor inspected the Site on 27/10/25 and considered that surface soils had been stripped from practically all developed areas of the Site, the main exceptions being the areas under established tree driplines, the two carparks, the main roadway and the southern sports field, as shown by shown in **Figure 2-48**.

EGA[41] also advised that "*All soils excavated during the demolition process were presumed to be impacted with ACM and subject to the appropriate asbestos controls once stockpiled*". The Site Auditor considered that the data provided by the ESAs, as documented in this SAR, supported this conclusion.

The EGA Demolition and Clearance Report documented the removal of ACM conduits that became exposed at the Building 1 footprint. The Site Auditor has documented the removal of this conduits in **Section 3.5.2**. No other buried services were reported by EGA to have been excavated and removed from the Site. The Site Auditor considered it was reasonable to assume that all other buried services remained on-site and would need to be removed and remediated as part of remediation and bulk earthworks.

[40] Figure 2 in Section 15.2, Ref [11]
[41] Section 5.1, Ref [10]

Figure 2-48 Extent of Excavation Work Observed by Site Auditor on 27/10/25



The EGA 2025 DSI[42] advised that 11,782 m^3 (loose) of bonded asbestos impacted soil was scraped from building footprints and across demolition work areas and placed in 20 stockpiles. Two of these stockpiles were located in the southern area AEC02 and the other 18 were spread around the Site. A copy of the stockpile summary given by the EGA 2025 DSI is provided in Table 2-20.

Table 2-20 EGA Stockpile Summary (Source: Section 11.6, Ref [11])

Stockpile ID	Figure	Approximate Estimated Volume (m^3)
AEC02		
AEC02-SP01	Figure 8	3,164
AEC02-SP02	Figure 8	992
AEC05		
AEC05-SP01	Figure 8	600
AEC05-SP02	Figure 8	98
AEC05-SP03	Figure 8	105
AEC05-SP04	Figure 8	275
AEC05-SP05	Figure 8	5010
AEC05-SP06	Figure 10	70
AEC05-SP07	Figure 10	140
AEC05-SP08	Figure 10	70
AEC05-SP09	Figure 10	130
AEC05-SP10	Figure 10	25
AEC05-SP11	Figure 10	40
AEC05-SP12	Figure 10	415
AEC05-SP13	Figure 10	265
AEC05-SP14	Figure 10	80
AEC05-SP15	Figure 10	3
AEC05-SP16	Figure 10	60
AEC05-SP17	Figure 10	215
AEC05-SP18	Figure 10	25

The locations of these stockpiles are shown in **Figures 2-44** and **2-46**. Each stockpile was reported to have geofabric across the base footprint and was covered by geofabric.

The Site Auditor considered the data provided by the EGA 2025 DSI on the scraping and stockpiling of asbestos contaminated soil at the Site as part of demolition work did not meet the documentation completeness DQO because of the following data gaps:

[42] Sections 11.6 & 15.1, Ref [11] – Note: The stockpiled quantities listed are taken from the table in Section 11.6 of the EGA DSI, with the total quantity of 4,156 m^3 given in Table 15.1.2 an error because it does not include the stockpiled soils that were sourced from AEC05

- Details on the locations where soils were scraped, how the soils were scraped, transported and stockpiled;
- Precautions taken to avoid dilution mixing and cross-contamination;
- The environmental control measures taken;
- Asbestos fibre and dust air monitoring conducted during the work;
- Survey data verifying stockpile sizes;
- There was a risk that friable asbestos may have been stockpiled since no sampling and testing work was undertaken; and
- There was a risk that some of the stockpiled soil would be geotechnically unsuitable since the material scraped were surface soils that would have contained B&D waste, topsoil and vegetative matter.

The Site Auditor also considered that was a risk that the extensive scraping undertaken at the Site up to 6/08/25 may have caused a much greater volume of asbestos contaminated soil to have been generated while reducing the concentration of some of the asbestos contamination through mixing with uncontaminated soil. The Site Auditor noted that the WA DOH (2022) asbestos guidelines[43] state that "*Impacted soil should not be mixed with other soil in a way that might compromise the concentration calculations (i.e. dilution is not permitted)*."

The Site Auditor considered that the excavation and stockpiling of large volumes of asbestos and potentially geotechnically unsuitable soil at the Site may have increased the volume of asbestos contaminated soil needing to be remediated and the cost to undertake the remediation work.

2.13.13 Final Surface Soil Clearance Post-Demolition

Refer **Section 3.7**.

2.14 Chemical Mixtures

The seventh check in the EPA decision process was that '*the impacts of chemical mixtures have been assessed*'.

The ESAs did not provide an assessment of the potential impacts of chemical mixtures. The Site Auditor addressed this deficiency by reviewing the available data.

The Site Auditor considered the main contaminants of concern, in terms of additive risks posed by chemical mixtures, were contaminants considered to be carcinogenic. These contaminants of concern at the Residential Subdivision comprised benzene, PCBs, OCPs and PAHs (principally BaP).

The Site Auditor assessed the available data and considered there were unlikely to be any additional risks to human health or the environment from chemical mixtures because all chemicals measured concentrations below the HIL A criteria, with practically all concentrations being non-detectible.

[43] Section 5.7.3, WA DOH (2022) Asbestos Guidelines

2.15 Groundwater Contamination

The fourth check in the EPA decision process was that *'groundwater (where relevant) has been assessed against relevant health-based investigation levels and, if required, any potential impacts to buildings and structures from the presence of contaminants considered.'*

The ninth check in the EPA decision process was that '*any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier'.*

2.15.1 Hydrogeological Assessment

The Alliance 2020 DSI constructed eight groundwater monitoring wells. The DSI did not assess the stratigraphic conditions at these wells or the hydrogeological conditions present. The Site Auditor addressed this data gap by reviewing the available data, with a summary of the borelog data provided in **Table 2-21**.

Table 2-21 Stratigraphic Conditions at Groundwater Monitoring Wells

Well ID	Fill / Topsoil (m)	Residual Clay (m)	Shale (m)	Depth to Groundwater (m)
BH01/MW01	1.20	1.20 – 5.80	5.80 – 6.40	0.875
BH02/MW02	2.00	2.00 – 10.00	10.00 – 10.50	3.800
BH03/MW03	0.80	0.80 – 7.50	7.50 – 8.50	5.960
BH04/MW04	0.20	0.20 – 1.30	1.30 – 6.50	4.503
BH05/MW05	0.20	0.20 – 1.30	1.30 – 6.70	5.385
BH06/MW06	1.50	1.50 – 2.20	2.20 – 6.60	Dry
BH07/MW07	0.50	0.50 – 2.50	2.50 – 6.10	Dry
BH08/MW08	0.50	0.50 – 1.40	1.40 – 6.50	4.335

The Site Auditor considered the available information indicated that the hydrogeological regime operating at the Site could be described as:

- An unconfined, phreatic aquifer flowing in the fill / residual clay layer at the southern part of the Site; and
- A semi-confined aquifer flowing in the fractured shale bedrock in the central and northern parts of the Site.

The Alliance 2020 DSI provided data on the variation in groundwater elevation across the Site by measuring the depth to the water table and surveying the top of casing elevation. This data is plotted in **Figure 2-48**. Alliance concluded that the data showed that shallow groundwater at the Site flowed in a southerly direction.

Figure 2-48: Alliance 2020 DSI Inferred Groundwater Flow Direction (Source: Figure 5, Ref [4])



The Site Auditor considered the available data supported this conclusion because:

- Shallow groundwater in the southern part of the Site flowed in an unconfined, phreatic aquifer, with the flow direction likely to be consistent with the topographic dip direction;
- The main receptor of surface water and groundwater from the Site was the Georges River located SW of the Site;
- Kelso Swamp was located SW of the Site; and
- The groundwater elevation data was based on the survey data collected by a licensed surveyor (i.e. Affinity Survey).

The Site Auditor also reviewed the available data to derive additional information on the hydrogeological regime operating at the Site. This included:

- The hydraulic gradient of shallow groundwater flow at the Site was derived from the change in groundwater elevation between wells MW08 and MW02 (10.631 m) divided by the distance between the two wells (565 m). These wells were selected because they are aligned in a north-south direction, which corresponds to the groundwater flow direction. The hydraulic gradient was 0.019; and
- The groundwater flow velocity was estimated to vary from 0.04 m/day to 10.9 m/day based on Darcy's Law (V = K I / ne). For a silty sand, permeability (K) varied from 10^{-3} to 10^{-6} m/sec, and the effective porosity (ne) varied from 0.15 to 0.45.

2.15.2 Intrinsic Groundwater Quality

The Alliance 2020 DSI measured field water quality parameters at the time the wells were purged, with the measured data provided in **Table 2-22**. The Alliance 2020 DSI provided no proper assessment of the intrinsic groundwater quality for the Site based on the field data collected. The Site Auditor addressed this deficiency by reviewing the available data.

The data indicated that:

- Groundwater across the Site was slightly acidic, with pH ranging from 5.28 to 6.59. There were no obvious pH trends across the Site;
- Drinking water and most major rivers have an electrical conductivity (**EC**) range of 200 – 800µS/cm. Water suitable for irrigation and livestock water has an EC range of 800 – 2,500µS/cm. The conductivity range indicating saline conditions not suitable for drinking water is 2,500 – 10,000 µS/cm, while sea water conductivity is 50,000 µS/cm. Conductivity levels in the six wells ranged from 8,962 µS/cm (well MW02) to 26,261 µS/cm (well MW05), which indicated that groundwater at the Site was saline to very saline and not suitable for drinking, or for irrigation or livestock water. These values were typical of groundwater in the underlying Wianamatta Shale;
- Dissolved oxygen (**DO**) concentrations in groundwater >1 ppm (equivalent to 1 mg/L) generally indicated aerobic conditions, while concentrations <1 ppm indicated anaerobic conditions. DO in the six wells ranged from 0.67 mg/L (well MW08) to 3.44 mg/L (well MW04), which indicated that groundwater at the Site ranged from anaerobic to aerobic; and
- The Redox potential of groundwater varied across the Site from a maximum of 158 mV (well MW05) to 60.5 mV, which indicated aerobic conditions.

Table 2-22 Intrinsic GW Quality Measured in January 2020 (Source: Table 8.8.1, Ref [4])

Sampling Point	Dissolved Oxygen (ppm)	Electrical Conductivity (µs/cm)	pH	Redox (mV)	Temperature (°C)
MW01	0.75	25151	6.32	60.5	22.6
MW02	1.86	8962	5.50	72.2	21.1
MW03	3.12	17277	5.28	134.8	22.5
MW04	3.44	17566	6.59	132.4	23.3
MW05	1.22	26261	6.16	157.7	24.9
MW06	Groundwater Well Dry				
MW07	Groundwater Well Dry				
MW08	0.67	24360	5.69	94.6	21.4

The Site Auditor considered the field water quality data indicated no significant contamination in groundwater at the Site and that the water quality was consistent with background levels in the underlying Wianamatta Shale..

2.15.3 Background Groundwater Quality

The Alliance 2020 DSI provided no proper assessment of background groundwater quality for the Site based on the field data collected. The Site Auditor addressed this deficiency by reviewing the available data.

The Site Auditor considered that background groundwater quality was best represented by the data provided by wells MW04, MW05 and MW08 located on the eastern and northern sides of the Site. This is because:

- These wells were located up-gradient of the southern boundary of the Site; and
- The intrinsic water quality data indicated that groundwater at these locations was consistent with the water quality in the underlying Wianamatta Shale.

The contaminant concentrations measured at these three upgradient wells on 8/01/20 were:

- Arsenic = 1 to 13 µg/L (ANZG freshwater = 13 µg/L);
- Cadmium = <0.2 to 16 µg/L (ANZG freshwater = 0.2 µg/L);

- Chromium = 3 to 15 µg/L (ANZG freshwater = 3.3 µg/L);
- Copper 2 to 22 µg/L (ANZG freshwater = 1.4 µg/L);
- Lead <1 µg/L (ANZG freshwater = 3.4 µg/L);
- Mercury <0.1 µg/L (ANZG freshwater = 0.06 µg/L);
- Nickel 62 to 340 µg/L (ANZG freshwater = 11 µg/L);
- Zinc 23 to 770 µg/L (ANZG freshwater = 8 µg/L);
- Ammonia (as NH_3) 420 to 1,200 µg/L (ANZG freshwater = 900 µg/L); and
- TRH F1, BTEX, VOCs, PAHs, OCPs, OPPs and PCBs non-detect.

The Site Auditor considered that the background groundwater quality upgradient of the Site had been contaminated by surrounding industrial activities. This was shown by the elevated levels measured for some heavy metals (e.g. cadmium, chromium, copper, nickel, zinc) and detectible ammonia levels. The Site Auditor considered these elevated background concentrations were not a significant issue for the purpose of this audit because groundwater in the area was natural saline and unsuitable for beneficial reuse due to the naturally high salinity of groundwater present in the Wianamatta Shales.

However, the Site Auditor considered it was important for assessments of groundwater contamination at the Site to consider the background contamination present in the area.

2.15.4 Groundwater Contamination

A summary of the groundwater quality data obtained by the Alliance 2020 DSI is provided in **Table 2-23**.

The Alliance 2020 DSI[44] concluded that:

- The detected COPC concentrations in groundwater were considered unlikely to present a risk to surrounding aquatic environments;
- All groundwater samples returned concentrations less than the adopted Groundwater Health Screening Levels for vapour intrusion (clay 2 - 4m) for a residential land use setting as per Table 1A (4) of NEPM 2013; and
- The detected concentrations of contaminants of potential concern in the groundwater samples analysed were considered unsuitable for discharge to municipal stormwater without further assessment/treatment due to the detected concentrations of the contaminants of concern analysed.

[44] Section 13, Ref [4]

Table 2-23 Summary of Alliance 2020 DSI Groundwater Quality Data

COPC	Unit	Concentration Ranges		GILs		
		Upgradient Wells (Background)	Downgradient Wells	Freshwater protection levels	Irrigation	Recreational
		Wells MW04, MW05, MW08	Wells MW01 - MW03			
Metals						
Arsenic (III)	µg/L	1 - 13	<1 - 1	24	100	**100**
Cadmium	µg/L	<0.2 - 16	0.3 - 1.7	0.2	1	**20**
Chromium (III)	µg/L	3	<1 - 2	3.3	100	**500**
Copper	µg/L	2 - 22	<1 - 30	1.4	200	**20,000**
Lead	µg/L	<1	1	3.4	2,000	**100**
Mercury (inorganic)	µg/L	<0.1	<0.1	0.06	2	**10**
Nickel	µg/L	**62 - 340**	12 - 67	11	200	**200**
Zinc	µg/L	23 - 77	48 - 210	8	2,000	--
Non-metallic inorganics						
Ammonia	µg/L	420 - 1,200	230 - 530	900	--	--
Petroleum hydrocarbons						
Benzene	µg/L	<1	<1	950	--	**10**
Toluene	µg/L	<1	<1	180	--	**8,000**
Ethylbenzene	µg/L	<1	<1	80	--	**3,000**
Xylenes	µg/L	<1	<1	75 - 350	--	**6,000**
PAHs						
Naphthalene	µg/L	<1	<1	16	--	**1.2**
Anthracene	µg/L	<1	<1	PQL (0.1)	--	**18,000**
Fluoranthene	µg/L	<1	<1	1	--	**8,000**
Phenanthrene	µg/L	<1	<1	0.6	--	--
Benzo(a)pyrene	µg/L	<1	<1	0.1	--	**18**
Other organics						
VOCs	µg/L	<1	<1			
PCBs	µg/L	<1	<1			
OCPs	µg/L	<1	<1			
OPPs	µg/L	<2	<2			
PFAS						
PFOS	µg/L	not tested	not tested	0.13	--	--
Sum of PFOS and PFHxS	µg/L	not tested	not tested	--	--	**2**
PFOA	µg/L	not tested	not tested	220	--	**10**

The Site Auditor considered the weight of evidence supported these conclusions because:

- The groundwater quality of the three downgradient wells (MW01 – MW03) was better than the background quality of groundwater given by the three upgradient wells (MW04, MW05 and MW08);
- Groundwater contamination migrating onto the Site from surrounding industrial properties had only caused some elevated metal and ammonia concentrations that should not pose a health risk if groundwater was not extracted for beneficial use at the Site;
- The quality of groundwater improved as it flowed through the Site due to attenuation and dilution from surface water infiltration. By the time groundwater had reached the southern downgradient boundary, the groundwater quality met the irrigation and recreational criteria and was close to meeting the freshwater ecological criteria;
- The data showed no evidence of groundwater contamination from off-site or on-site sources of anthropogenic organic chemicals such as BTEX, PAHs, VOCs, PCBs, OCPs and OPPs;
- The data showed no evidence of landfill waste had been buried at the Site;
- The data showed no evidence of groundwater contamination migrating onto the Site from the downgradient Kelso Landfill;
- The absence of PFAS testing by the Alliance 2020 DSI was not considered significant because there was no evidence of PFAS use by nearby industrial properties and because there was no evidence of leachate from the Kelso Landfill migrating onto the Site; and
- The elevated metal and ammonia concentrations, particularly in the northern part of the Site, would make groundwater that ponded in excavations associated with the proposed residential development unsuitable for discharge to municipal stormwater without further assessment / treatment.

2.16 Soil Vapours

The fifth check in the EPA decision process was that '*hazardous ground gases (where relevant) have been assessed against relevant health-based investigation levels and screening values.*

The ninth check in the EPA decision process was that '*any evidence of, or potential for, migration of contaminants from the site has been appropriately addressed, including potential risks to off-site receptors, and reported to the site owner or occupier*'.

Volatile Petroleum Hydrocarbons

The Alliance 2020 DSI[45] concluded that soil vapours from VOCs posed a low contamination risk at the Site. The Site Auditor considered the weight of evidence generally supported this conclusion because:

- The historical data indicated there was a low risk of significant volatile contamination from activities conducted at the Site (**Section 2.3**);
- The main AEC with regard to volatile organic contamination were two relatively small USTs (2,500 L each) located in the western central region of the Site that were used to store

[45] Section 13, Ref [4]

unleaded petrol and diesel. SafeWork NSW records indicate that these two tanks were removed on 19/12/1997, which is over 25 years ago;

- The ESAs met or was close to meeting the DQOs with regard to testing soil and groundwater samples for TRH F1, naphthalene and BTEX; and
- All soil and ground water samples collected and lab tested by the ESAs measured non-detectible TRH F1, naphthalene and BTEX concentrations;

However, no data was provided on the removal and disposal of the two USTs or the validation of remaining soils. The Site Auditor considered this data gap should be addressed by PID headspace screening of soils excavated in the vicinity of the former UST location during the residential redevelopment work. If PID readings exceeded 20 ppm, then soil samples should be collected from the area and lab tested for TRH and BTEXN. This recommendation is further discussed in **Section 2.18**.

LFG

AEC06 in the CSM (**Section 2.5.1**) concerned the risk of LFG migrating from Kelso Landfill under the M5 Motorway and into the southern part of the Site. As previously explained in **Section 2.3.8**, the Site Auditor considered that the Kelso Landfill posed a low risk of landfill waste being dumped at the Site, and a low risk of landfill leachate flowing onto the Site. However, Kelso Landfill posed a risk of LFG migrating onto the Site because:

- The EPL allowed putrescible waste, garden waste and other biodegradable waste to be accepted at the tip;
- The EPL required to Council to continue LFG monitoring at 8 locations; and
- The proximity of the landfill to the Site (<100 m).

It is possible that construction of the M5 Motorway in 1992 may have created a barrier preventing LFG migrating northward under the M5 Motorway and onto the Site. Nevertheless, this potential source of contamination needed to be included in the CSM for contamination at the Site and the risk investigated.

None of the ESAs investigated the presence of LFG along the southern boundary of the Site. The Site Auditor addressed this data gap by including a recommendation for such work in **Section 2.18**.

2.17 Ecological Risks

The eighth check in the EPA decision process was that '*any potential ecological risks have been assessed*'.

The Site Auditor considered that contamination in soils and groundwater at the Site posed a low ecological risk for the reasons given in **Sections 2.13** and **2.15**, respectively.

2.18 Management Strategy

The ninth check in the EPA decision process was that *'the site management strategy is appropriate'.*

The EGA 2025 DSI[46] concluded that an updated site-wide RAP was required to:

- Outline the remediation methodologies needed to remediate the newly identified extent of asbestos contamination identified; and
- A supplementary contamination assessment was required prior to the start of remedial works at the Site. The areas needing to be further investigated were AEC01a (former child care centre), AEC04 (former UST area), AEC05 (building footprints), AEC06 (LFG southern boundary) and AEC07 (groundwater migrating onto Site along northern and eastern boundaries).

The Site Auditor considered the weight of evidence provided by the ESAs supported the need for a revised RAP to be prepared to address:

- Impacts caused by the demolition work that was completed in August 2025;
- Known bonded and friable asbestos contamination across most areas of the Site (except for the southern sports field, main car parks and roadway, Northern Conservation Area);
- The need to remediate asbestos contamination in the large volume of stockpiled soil;
- The potential geotechnical unsuitability of stockpiled soil for reuse;
- Remediation strategies that address the potential for new asbestos contamination finds at the Site;
- The need to remove and remediate buried services and possibly septic tanks that remain at the Site; and
- The need for further investigation of possible heavy metal contamination in the former child care centre (AEC01a), possible petroleum hydrocarbon contamination in former UST area (AEC04), LFG risks along the southern property boundary (AEC06), and fly-tipping of rubbish and waste in the Northern Conservation Area (AEC09c).

The Site Auditor addressed the need for these additional site management requirements when reviewing:

- A demolition clearance report prepared by EGA dated 15/10/25 (Ref [10]), with the results of the Site Auditor's review documented in **Section 3**; and
- A revised RAP prepared for the Site by EGA dated 24/10/25 (Ref [12]), with the results of the Site Auditor's review documented in **Section 4**.

[46] Section 16, Ref [11]

3. Review of Demolition Clearance & Early Remediation Work

This section of the SAR reviews a demolition clearance report prepared by EGA dated 15/10/25 (Ref [10]). The report was prepared following the completion of demolition works that were completed in August 2025. The Site Auditor initially reviewed an earlier version of the report dated 30/07/25, with review comments documented in an interim audit advice dated 9/10/25.

This section of the SAR also reviews early remediation work reported to have been conducted at the Site during the demolition work period. This work was documented in the 2025 RAP (Ref [12]). The Site Auditor initially reviewed an earlier version of the report dated 11/09/25, with review comments documented in an interim audit advice dated 15/10/25.

3.1 Council Requirements

Council issued Development Consent DA-1512/2023 on 31/05/24 (Ref [53]), which allowed Mirvac to demolish selected buildings and structures at the Site in four stages labelled Zone 1Red, Zone 2 Yellow, Zone 3 Green and Zone 4 Blue. The locations of these four zones are shown in **Figure 3-1**. The Consent advised that the works included the disconnection of utility services and the demolition of all nominated buildings to ground level.

Conditions of the Consent relevant to this site audit included:

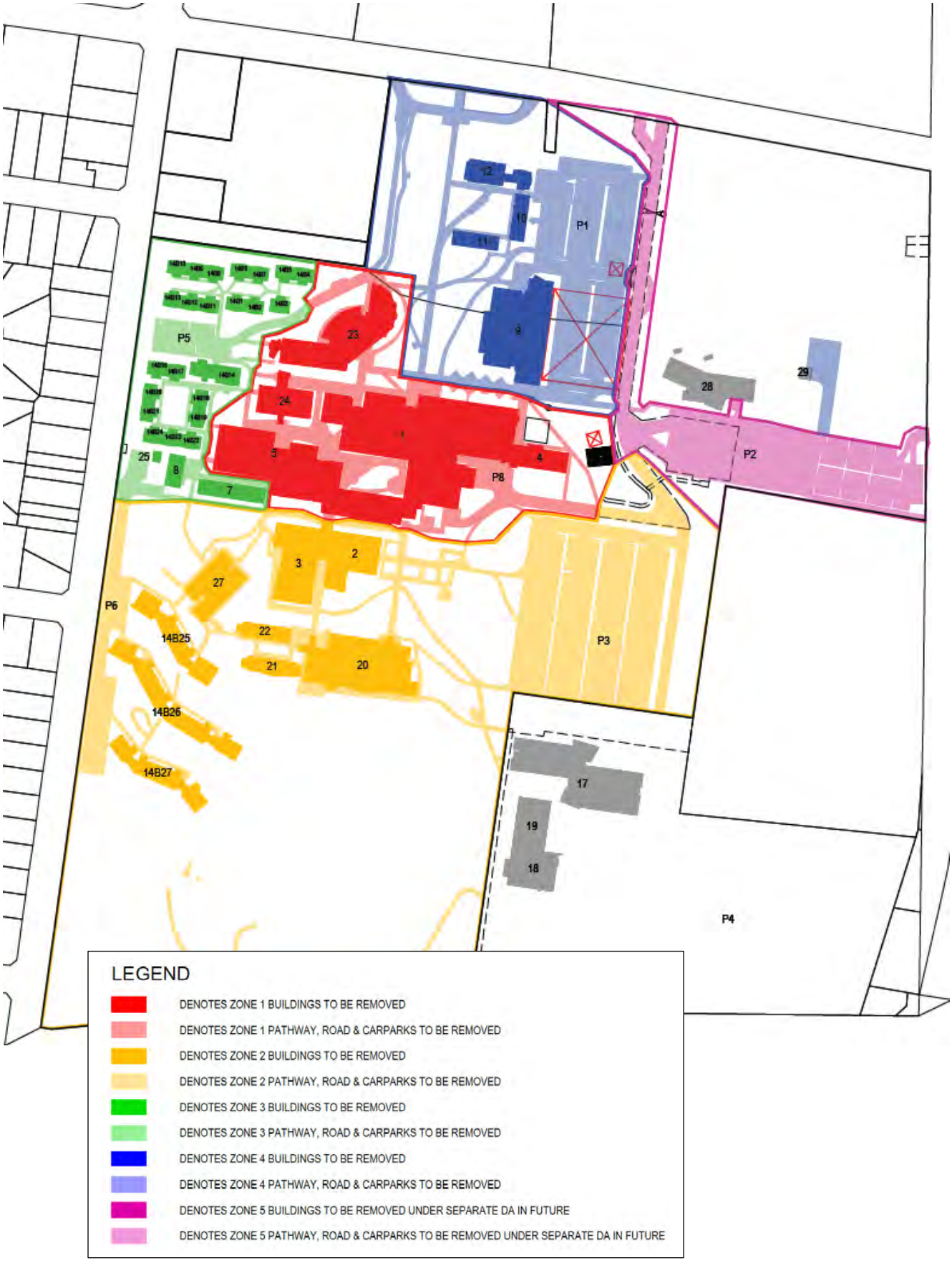
- **Condition 1.3 No consent is granted for Zone 5 – Purple or adjoining tanks**: This Development Consent only grants consent for demolition of the marked structures and improvements in Zone 1 Red, Zone 2 Yellow, Zone 3 Green and Zone 4 Blue as per the approved plan. No consent is granted for works within the Zone 5 Purple or the demolition of the tanks as identified in red on the approved plans.
- **Condition 1.7 Demolition Conditions:** The Hazardous Material Survey prepared by Sydney Environmental Group, titled 'Hazardous Building Materials Survey Report - Western Sydney University – Bankstown Campus, Milperra NSW', dated 8 November 2023, reference 2300-HBMS-071123.v1f and all the recommendations stated within this report forms part of the development consent.

  All recommendations in the above-mentioned report are to be implemented and a clearance certificate issued by an appropriately qualified occupational hygienist is to be submitted to Council at the conclusion of demolition works.
- **Condition 2 Demolition Conditions**: The demolition of all structures marked within the red, yellow, green and blue coloured zones on the approved plans (as endorsed by Condition 1.1) must be undertaken, subject to strict compliance with the following: -

  f. Demolition is to be carried out in accordance with the appropriate provisions of Australian Standard AS2601-2001.

  h. Where materials containing asbestos cement are to be removed, demolition is to be carried out by licensed contractors who have current Workcover Accreditation in asbestos removal.

Figure 3-1 Approved Demolition Zones (Source: Ref [51])



i. Hazardous or intractable wastes arising from the demolition process shall be removed and disposed of in accordance with the requirements of WorkCover NSW and the NSW EPA 'Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes 2004'.

j. Demolition procedures shall maximise the reuse and recycling of demolished materials in order to reduce the environmental impacts of waste disposal.

p. Before the demolition of any building constructed before 1970, a Work Plan shall be prepared and submitted to Council in accordance with Australian Standard AS2601-2001 by a person with suitable expertise and experience. The Work Plan shall outline the identification of any hazardous materials, including surfaces coated with lead paint, method of demolition, the precautions to be employed to minimise any dust nuisance and the disposal methods for hazardous materials.

- **Condition 3.6 Hazardous finds**: Any new information revealed during demolition work/s that has the potential to alter previous conclusions about site contamination or hazardous materials shall be immediately notified to the Council and the principal certifier. Works are to cease until the new information is evaluated by an appropriately qualified and experienced environmental consultant and an appropriate response determined by the consent holder and/or owner which is agreed to by Council. Council may also request that a NSW EPA accredited site auditor is involved to assist with the assessment of the new contamination information.
- **Condition 3.13 Protection of the Environment Operations (Waste) Regulation 2014**: All soils and material, liquid and solid, to be removed from the site must be analysed and classified by an appropriately qualified and experienced environmental consultant, in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 and related guidelines, the 'Waste Classification Guidelines' (NSW EPA, 2014), prior to off-site disposal.

  The waste classification report, including the results of testing, must be compiled, or reviewed and approved by an appropriately qualified and certified consultant, before off-site disposal.

  A copy of the waste classification report must be submitted to Council on commencement of works.

  All waste material must be disposed of at an appropriately licensed waste facility for the specific waste. Receipts for the disposal of the waste must be submitted to Council at the commence of works.

  All waste must be transported by a contractor licensed to transport the specific waste, and in vehicles capable of carting the waste without spillage and meeting relevant requirements and standards. All loads must be covered prior to vehicles leaving the site.

3.2 Objectives

The Demolition Clearance Report[47] advised that its objectives were to:

- Prepare an interim site validation report to document the inspection and removal of hazardous building materials from structures within the site;
- Satisfy conditions 1.7 and 3.6 of the development consent (DA-1512/2023);
- Verify that the demolition areas were free from hazardous building materials like asbestos;
- Provide documentation to Council demonstrating that the demolition work was completed according to regulations;
- Certify that the land was stable and ready for subsequent remediation, excavation, construction, or other development activities; and
- Confirm there was no negative impact on the surrounding area for the completed demo0lition work, thereby preventing potential environmental risks.

The Site Auditor considered these objectives were consistent with NSW regulatory requirements.

3.3 Documentation Provided by Demolition Clearance Report

The documentation provided by the Demolition Clearance Report included, among other things:

- Objectives (Section 1.3);
- Asbestos clearance methodology (Section 1.5);
- Summary of hazardous building materials identified in the EGA (27/02/24) HAZMAT report (Ref [9]), which was referenced by the Consent (Section 2 & Appendix A);
- Summary of new hazardous materials finds made during the demolition work (Section 3);
- Summary of hazardous materials removal work (Section 4);
- Asbestos fibre air monitoring (Section 4.9);
- Waste disposal (Section 4.10);
- Clearance of visible asbestos from building footprints (Section 5); and
- Conclusions (Section 6).

The Site Auditor considered the scope of documentation provided by the Demolition Clearance Report allowed the Site Auditor to assess compliance with the report objectives.

3.4 Asbestos Clearance Methodology

The Demolition Clearance Report[48] advised that clearances of bonded asbestos removal works were completed by suitably qualified and experience occupational hygienists deemed as competent by the supervising NSW Licensed Asbestos Assessor. Friable asbestos removal works were completed by a NSW Licensed Asbestos Assessor. The methodology used for the visual clearance of ACM building materials at the completion of removal works involved:

[47] Section 1.3, Ref [10]
[48] Section 1.5, Ref [10]

- Former location of the ACM and immediate surroundings visually inspected for suspected ACM;
- Removal area inspected closely for nail heads, screws, fixtures or fittings which may be concealing residual ACM building material;
- Removal area photographed; and
- Transit route visually inspected for suspected ACM comprising systematic grid-based walkover with 2m lane spacing.

The methodology used to clear soil surface involved:

- Former location of ACM and immediate surroundings visually inspected for suspected ACM, comprising systematic grid-based walkover with 2m lane spacing;
- Removal area photographed; and
- Transit route visually inspected for suspected ACM comprising systematic grid-based walkover with 2m lane spacing.

The Site Auditor considered the methodology documented in the Demolition Clearance Report was reasonable for ACM, but no methodology was given for the removal of lead-based painted surfaces, PCB light fittings and SMF. It was important for these other types of hazardous building materials to be properly removed since the data provided by the SEG 2024 HAZMAT (Ref [9]) showed that these other types of materials were also present in the buildings. In separate feedback, EGA[49] advised inspections were not completed by EGA for the removal of these other hazardous building materials.

The Site Auditor considered this data gap when reviewing other parts of the Demolition Clearance Report.

3.5 Hazardous Materials Removal Work

3.5.1 Documentation Completeness

The Demolition Clearance Report[50] advised that hazardous building material removal occurred between October 2024 and July 2025 prior to the demolition of on-site structures, with the work being carried out in line with the SafeWork NSW (2022) "*Code of Practice: How to Safely Remove Asbestos*". The buildings that were demolished at the Site are shown in **Figure 3-2**. A summary of the HAZMAT inspection and visible asbestos clearance reports is provided in **Table 3-1**.

The Site Auditor inspected the Site on 27/10/25 and confirmed that all the buildings at the approved demolition zones had been demolished and no evidence of B&D waste stockpiles was observed on-site. None of the roadways, pathways and carparks in Zone 5 had been demolished. Copies of photos taken by the Site Auditor during this inspection are provided in **Appendix D**.

[49] EGA 15/10/25 email
[50] Section 4, Ref [10]

Figure 3-2 Plan Showing Buildings Demolished (Source: Figure 2, Ref [10])

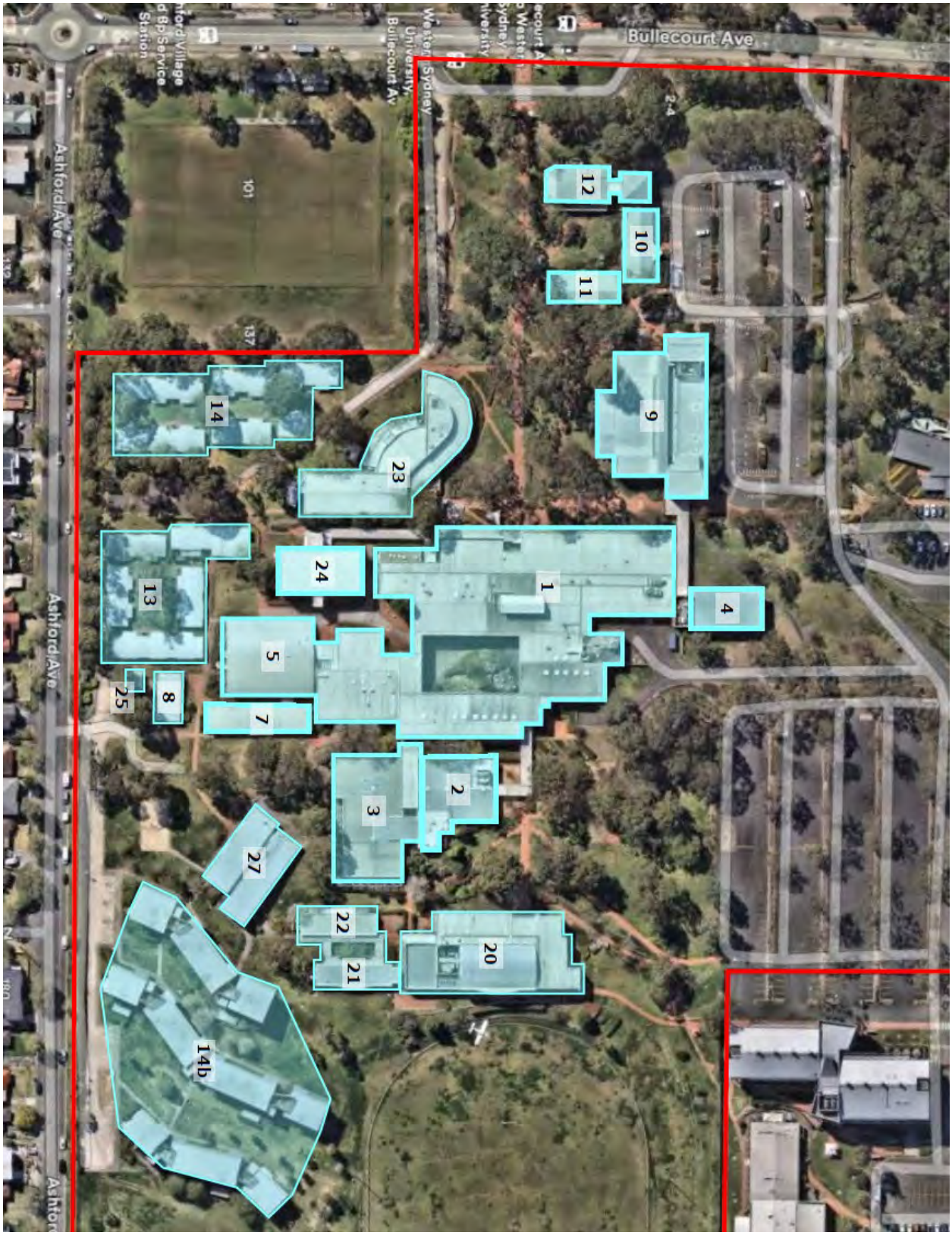


Table 3-1 Summary of Asbestos Clearance Data from EGA Demolition Clearance Report – page 1 of 4

Building No.	HAZMAT Inspection				Visible Asbestos Clearance Report				
	Report Date	Occupational Hygienist	LAA Licence	Asbestos Identified	Date	Occupational Hygienist	LAA Licence	Asbestos removed	Date ACM Removed
1	27/02/2024	SEG	LAA002039	Electrical distribution box					
	19/09/2024	Work Science	LAA 000143						
	18/11/2024	SEG	LAA002032	Fire door	10/12/2024	SEG	LAA002032	6 plant room fire doors	4/12/24 to 9/12/24
	25/11/2024	SEG	LAA002032	ACM fragments across building footprint, air duct cladding, ACM formwork for concrete foundations	16/01/2025	SEG	??	ACM fragments across building footprint, air duct cladding, ACM formwork for concrete foundations	
	29/11/2024	SEG	??	Wall lining in elevator shaft	15/01/2025	SEG	??	Wall lining in elevator shaft	13/01/2025
	11/12/2024	SEG	??	Blackjack in ceiling linings (friable)	12/03/2025	SEG	LAA001322	Blackjack in ceiling linings (friable)	4/03/25 to 10/03/25
	21/03/2025	SEG	??	ACM buried pipe					
	--	--	--	--	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
2	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
3	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
4	27/02/2024	SEG	LAA002039	Electrical distribution box	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
	19/09/2024	Work Science	LAA 000143						
5	27/02/2024	SEG	LAA002039	Panelling & electrical distribution box					
	19/09/2024	Work Science	LAA 000143	External wall cladding (non-friable ACM 300 m2)	11/11/2024	Work Science	??	External wall cladding	7/11/24 to 11/11/24
	28/03/2025	SEG	??	ACM fragments across building footprint	13/05/2025	EGA	LAA002032	ACM fragments across building footprint	1/05/25 to 8/05/25
	--	--	--	--	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??

Table 3-1 (cont'd) Summary of Asbestos Clearance Data from EGA Demolition Clearance Report (Ref [10]) – page 2 of 4

Building No.	HAZMAT Inspection				Visible Asbestos Clearance Report				
	Report Date	Occupational Hygienist	LAA Licence	Asbestos Identified	Date	Occupational Hygienist	LAA Licence	Asbestos removed	Date ACM Removed
7	27/02/2024	SEG	LAA002039	Electrical distribution box	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
	19/09/2024	Work Science	LAA 000143						
8	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
9	27/02/2024	SEG	LAA002039	Electrical distribution box	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
	19/09/2024	Work Science	LAA 000143	Ground floor RHS corridor – safe (assumed friable)					
10	27/02/2024	SEG	LAA002039	Electrical distribution box					
	19/09/2024	Work Science	LAA 000143						
	6/05/2025	EGA	LAA002032	ACM packers between building floor & brick footings	17/06/2025	EGA	??	ACM packers between building floor & brick footings	??
	8/05/2025	EGA	LAA002032	ACM fragments across building footprint	3/06/2025	EGA	??	ACM fragments across building footprint	3/06/2025
	--	--	--	--	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
11	27/02/2024	SEG	LAA002039	Electrical distribution box					
	19/09/2024	Work Science	LAA 000143						
	8/05/2025	EGA	LAA002032	Eaves & underside roof lining	15/05/2025	EGA	??	Eaves & underside roof lining	15/05/2025
	8/05/2025 & 21/05/2025	EGA	LAA002032	Eaves	21/05/2025	EGA	??	Eaves	20/05/2025
	4/06/2025	EGA	LAA002032	ACM formwork under concrete walkway	5/06/2025	EGA	??	ACM formwork under concrete walkway	4/06/2025
	--	--	--	--	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??

Table 3-1 (cont'd) Summary of Asbestos Clearance Data from EGA Demolition Clearance Report (Ref [10]) – page 3 of 4

Building No.	HAZMAT Inspection				Visible Asbestos Clearance Report				
	Report Date	Occupational Hygienist	LAA Licence	Asbestos Identified	Date	Occupational Hygienist	LAA Licence	Asbestos removed	Date ACM Removed
12	27/02/2024	SEG	LAA002039	Electrical distribution box	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
	19/09/2024	Work Science	LAA 000143						
13	--	--	--	--	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
14	27/02/2024	SEG	LAA002039	None	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
14b	19/09/2024	Work Science	LAA 000143						
	21/03/2025	SEG	??	ACM fragments on underside of concrete footpath	4/03/2025	SEG	LAA002032	ACM fragments on underside of concrete footpath	2/03/25 to 3/03/25
					14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
20	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
21	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
22	27/02/2024	SEG	LAA002039	Electrical distribution box	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						
23	27/02/2024	SEG	LAA002039	Electrical distribution box	9/07/2025	EGA	??	Only a clearance inspection conducted on 7/07/25	??
	19/09/2024	Work Science	LAA 000143						
24	27/02/2024	SEG	LAA002039	Electrical distribution box					
	19/09/2024	Work Science	LAA 000143						

Table 3-1 (cont'd) Summary of Asbestos Clearance Data from EGA Demolition Clearance Report (Ref [10]) – page 4 of 4

Building No.	HAZMAT Inspection				Visible Asbestos Clearance Report				
	Report Date	Occupational Hygienist	LAA Licence	Asbestos Identified	Date	Occupational Hygienist	LAA Licence	Asbestos removed	Date ACM Removed
25	19/09/2024	Work Science	LAA 000143		14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
27	27/02/2024	SEG	LAA002039	None	14/05/2025	EGA	??	Only a clearance inspection conducted on 14/05/25	??
	19/09/2024	Work Science	LAA 000143						

Legend:

Data gap / deficiency in EGA report

Absence of waste disposal data

Notes:

1. SEG = Sydney Environmental Group

Documentation provided in the Demolition Clearance Report showed that:

- Prior to demolition, HAZMAT inspections were undertaken by occupational hygienists from SEG and Work Science, with the results of these inspections documented in a large number of reports prepared between 27/02/24 to 4/06/25. The reports showed that HAZMAT inspections were undertaken for Buildings 1 – 5, 7 – 12, 14, 14b, 20 – 25 and 27. Buildings 6, 15 – 19 and 26 did not exist. However, no HAZMAT inspection was undertaken for Building 13, which was a large structure located in the NW part of the Site; and
- Following demolition, visible asbestos clearance reports were prepared by EGA between 11/11/24 and 9/07/25. The reports showed that visible asbestos clearances were undertaken for Buildings 1 – 5, 7 – 14, 14b, 20 – 23, 25 and 27. No visible asbestos clearance report was prepared for Building 24 located in the central part of the Site.

The Site Auditor considered that the data provided in the inspection and clearance reports show that:

- A licensed occupational hygienist conducted most of the HAZMAT inspections conducted by SEG and Work Science, while an unlicensed occupational hygienist undertook most of the visible asbestos clearance; and
- Few of the visible asbestos clearance reports advise when the visible asbestos was removed from the building and disposed.

The Site Auditor has considered these data gaps when assessing the adequacy of the demolition clearance report in **Section 3.8**.

3.5.2 Issues Identified by Site Auditor

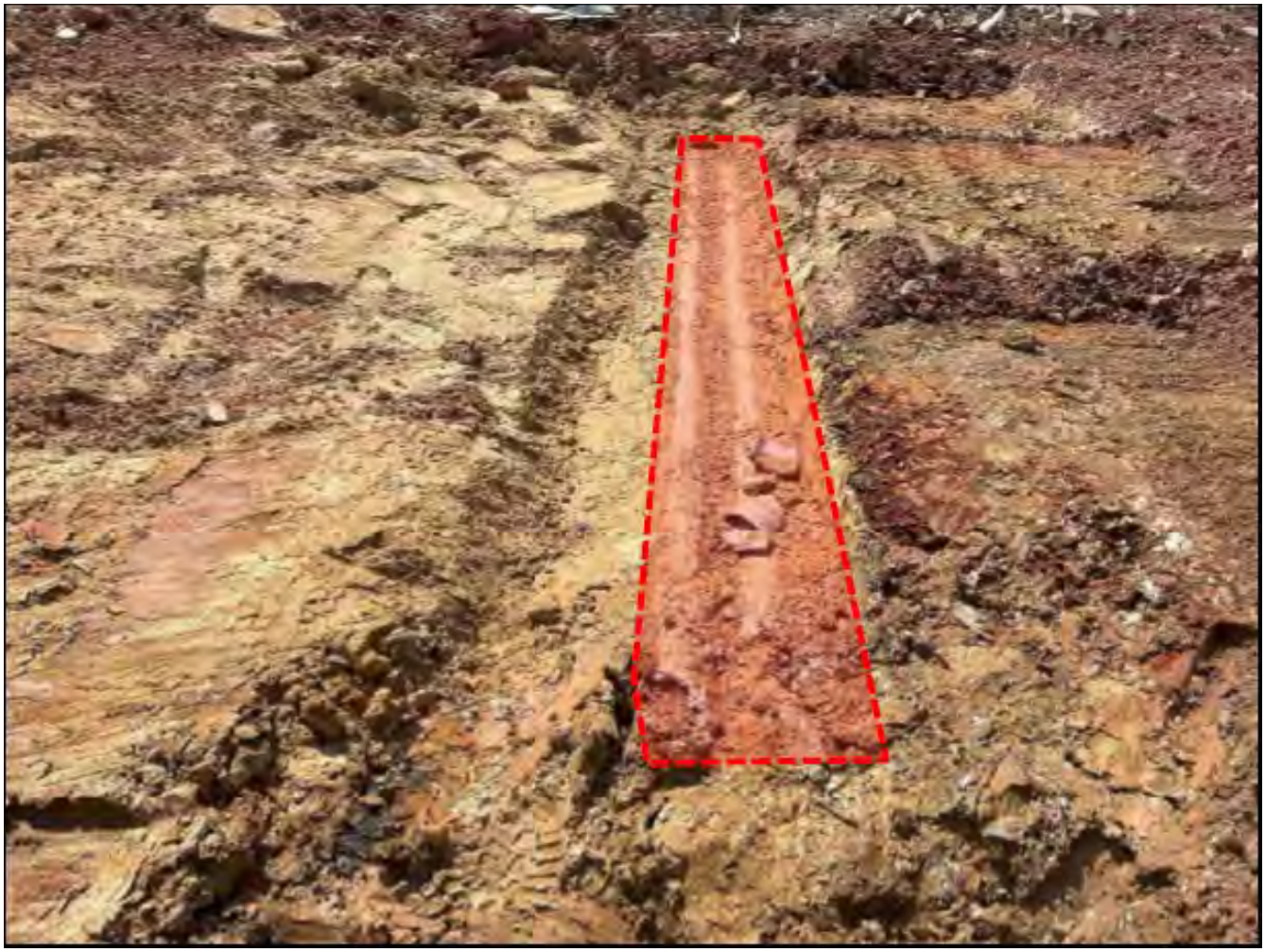
ACM Buried Pipe

The SEG (21/03/25) inspection report for Building 1 identified the presence of buried asbestos pipes at the ground surface, with a photo of the pipes provided in **Figure 3-3**. The Demolition Clearance Report[51] advised that the actions taken were:

- Following the completion of demolition works for structure 1, presumed asbestos fibre cement conduits were identified by the demolition contractor. Work was stopped;
- SEG inspected the area on 19/03/25. A lab test on a sample confirmed the presence of bonded ACM;
- The pipes were removed by the demolition contractor (Class A Licensed Asbestos Removalist AD214333) on 12-13/06/25 under the supervision of EGA. The pipes were first exposed without damage using a hydraulic excavator prior to being removed by hand in 2 m sections separated at the joins and wrapped in a double layer of polyethylene sheeting (200 µm thick) prior to disposed off-site along with associated PPE utilised by workers;
- Boundary control airborne asbestos monitoring was undertaken for the duration of the removal work;

[51] Section 4.3.7, Ref [10]

Figure 3-3 ACM Buried Pipe with Fragments at Building 1 (Source: SEG 21/03/25, Ref [10])



- The conduits were observed to run for 50 m in a north-south orientation before they transitioned to PVC; and
- Following the completion of removal works, SEG completed a visual clearance inspection in the former location of the conduits on 12-13/06/25, with no evidence of ACM found.

The Site Auditor considered the description provided in the Demolition Clearance Report indicated that the work was likely to have been appropriate and met regulatory requirements.

ACM Fragments Attached to Concrete

The Demolition Clearance Report[52] advised that at Building 14B, asbestos fragments were described as having been bonded to the underside of concrete footpath slabs. The report described the actions taken as being:

- The presence of ACM fragments attached to the underside of concrete footpath slabs adjacent structure 14B was identified by the demolition contractor. Works were stopped.

[52] Section 4.4.1, Ref [10]

- SEG inspected the area on 19/03/25 to carry out an inspection. A lab test on a sample confirmed the presence of bonded ACM;
- Removal work was undertaken on 2-3/03/25 by the demolition contractor (Class A licensed asbestos removalist AD214333) under the supervision of SEG. Concrete slabs were turned over, exposing the underside where the ACM fragments were present. The ACM fragments were loosely attached and easily removed by hand, with the fragments placed in polyethylene bags (200 µm thick) prior to disposal off-site. The concrete slabs were visually cleared prior to disposal off-site as special waste;
- Following the load out of concrete materials, the residual soil surface was subject to picking. The asbestos removalist travelled through the area in a systematic grid-based pattern. ACM fragments were picked from the soil surface by hand and placed in polyethylene bags (200 µm thick). Two passes were completed, with picking continuing until no visible asbestos remained on the soil surface. The picked fragments were disposed off-site along with associated PPE utilised by workers; and
- Following the completion of removal works, SEG completed a visual clearance inspection of the concrete slabs on 2/03/25 and within the former location of the concrete slabs on 3/03/25 and found no evidence of asbestos remaining.

The Site Auditor considered the description provided in the Demolition Clearance Report indicated that the work was likely to have been appropriate and met regulatory requirements.

3.6 Early Remediation Work

3.6.1 AEC01 – Friable Asbestos Soil

The 2025 RAP[53] advised that early remediation work was undertaken within AEC01 as part of the demolition work involving the excavation and off-site disposal of friable asbestos impacted soil at five of the six hot-spots at sample locations EBH2, EBH3, EBH5, SS10 and BH39. The work was reported to have been conducted on 13/12/24 and involved:

- Excavation of each hotspot to a depth of 0.6 m (Note: The EGA 2025 DSI advised that each hotspot was 5x5m in area, but the area excavated was not specified by EGA);
- The excavated soil was temporarily stockpiled on and subjected to a waste classification prior to disposal off-site to a licensed receiving facility;
- The removal work was undertaken by ASP Pty Ltd, a Class A Licensed Asbestos Removalist (AD210968), under the supervision of SEG;
- Following the removal work, a grid-based visual inspection was conducted of the residual soil surface within the subject areas. No ACM was observed on the residual soil surface within the subject area during or following the removal works;
- Validation samples (500 ml) were collected from the base and the walls of the excavation and submitted for laboratory analysis. No asbestos was detected above the laboratory limit of reporting within any of the validation samples;
- Boundary control airborne asbestos monitoring was undertaken for the duration of the removal works; and

[53] Section 4.10.1, Ref [12]

- Clearance airborne asbestos monitoring was undertaken within the subject area following the completion of removal works.

EGA concluded that the friable asbestos hazard at the five locations in AEC01 was remediated and validated. An asbestos materials clearance inspection report was prepared on 20/12/24 but a copy was not provided prior to this SAR being issued.

The Site Auditor considered that a copy of the 20/12/24 EGA report needed to be provided to the Site Auditor so that the adequacy of the early remediation work at AEC01 and the need for additional remediation / validation work could be assessed prior to the commencement of further remediation work at the Site. The Site Auditor addressed this data gap by including the following condition on the Section B SAS:

> *"A copy of the EGA (14/10/24 & 20/12/24) reports on early remediation work at friable asbestos hot-spots at AEC01 and AEC02 needs to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work can be assessed prior to the commencement of remediation work at the Site."*

The 2025 RAP also advised that the remaining friable asbestos hot-spot at AEC01 was not remediated in December 2024 because it was located in a tree protection zone, which prevented disturbance of underlying soil. These materials presented a friable asbestos risk that required further assessment and remediation. The 2025 RAP[54] advised that no works would be undertaken within tree protection zones as part of the Category 2 remedial scope.

The Site Auditor addressed the risks posed by friable and bonded asbestos remaining buried in soils within tree protection zones by including the following condition of the Section B SAS:

> *"The project environmental consultant needs to prepare a work plan for the remediation of asbestos contamination within tree protection zones so that the plan can be reviewed and approved by the Site Auditor, the necessary regulatory approvals obtained for the work, and remediation work completed prior to the commencement of bulk earthworks at development stages where tree protection zones are located."*

3.6.2 AEC02 – Friable Asbestos Soil

The 2025 RAP[55] advised that early remediation work was undertaken within AEC02 as part of construction work for a sedimentation basin in the SW corner of the Site involving the excavation and off-site disposal of friable asbestos impacted soil at two hot-spots at sample locations EBH24 and EBH25. The work was reported to have been conducted on 4/10/24 and involved:

- Excavation of each hotspot over a 5 x 5m area to a depth of 0.6 m;
- The excavated soil was temporarily stockpiled on and subjected to a waste classification prior to disposal off-site to a licensed receiving facility;
- The removal work was undertaken by ASP Pty Ltd, a Class A Licensed Asbestos Removalist (AD210968), under the supervision of SEG;

[54] Section 10.4, Ref [12]
[55] Section 4.10.2, Ref [12]

- Following the removal work, a grid-based visual inspection was conducted of the residual soil surface within the subject areas. No ACM was observed on the residual soil surface within the subject area during or following the removal works;
- Validation samples (500 ml) were collected from the base and the walls of the excavation and submitted for laboratory analysis. No asbestos was detected above the laboratory limit of reporting within any of the validation samples;
- Boundary control airborne asbestos monitoring was undertaken for the duration of the removal works; and
- Clearance airborne asbestos monitoring was undertaken within the subject area following the completion of removal works.

EGA concluded that the friable asbestos hazard at the two locations in AEC02 was remediated and validated. An asbestos materials clearance inspection report was prepared on 14/10/24 but a copy was not provided prior to this SAR being issued.

The Site Auditor considered that a copy of the 14/10/24 EGA report needed to be provided to the Site Auditor so that the adequacy of the early remediation work at AEC02 and the need for additional remediation / validation work could be assessed prior to the commencement of further remediation work at the Site. The Site Auditor addressed this data gap by including a condition on the Section B SAS as described in the previous section.

3.7 Waste Disposal

The Demolition Clearance Report[56] advised that as part of the demolition work, ACM and used PPE were secured within polyethylene bags or sheeting (200 µm thick) and placed in a plastic lined skip bins for disposal off-site to a licensed waste receiving facility. Records indicated that:

- General demolition wastes were removed from the Site and managed in accordance with POEO waste regulations 2014;
- All wastes removed from Site were pre-classified as either Special Waste (Asbestos) or GSW (B&D waste);
- All wastes were conveyed to receiving facilities in possession of the appropriate licenses for the waste received;
- Wastes were transported by suitably licensed contractors, loads were covered prior to leaving Site and there were no reports of incidents or spills during transport.;
- The waste was transported to Bingo Recycling at their Eastern Creek facility (EPL 13426) and Cleanaway at their Kemps Creek facility (EPL 4068); and
- A total of 156.84 tonnes of asbestos waste generated by the demolition work was removed offsite.

A summary prepared by the Site Auditor of waste disposal records and related tipping dockets associated with the demolition work provided in the Demolition Clearance Report is presented in **Table 3-2**.

[56] Section 4.10, Ref [10]

Table 3-2 Summary of Tip Dockets for Asbestos Waste Disposal by Demolition Work

Date	Source	Transporter	EPA Waste Tracking Form	Waste Disposal Facility	Waste Classification	Amount (T)
11/11/2024	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	1.50
11/11/2024	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	0.72
12/11/2024	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	0.76
14/01/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	1.1
16/01/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	0.56
1/02/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	0.26
26/02/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	1.42
28/02/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	2.96
4/03/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	10.96
6/03/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	4.06
6/03/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	3.94
6/03/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	12.38
7/03/2025	Milperra site	ARP	yes	Bingo Eastern Creek	AMW	4.06
13/05/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	6.12
29/05/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	9.66
29/05/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	13.66
12/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	7.20
12/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	10.50
13/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	18.00
17/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	10.02
23/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	8.08
24/06/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	17.20
10/07/2025	?	?	no	Cleanaway Kemps Ck	Asbestos	11.70
					TOTAL	**156.82**
Notes;			**Legend:**			
1. ARP = Asbestos Removal Professionals				Data gap		
2. AMW = Asbestos mixed waste						

The Site Auditor considered that uncertainties remained as to whether all hazardous building material waste and asbestos contaminated soil excavated generated during the period of the demolition work, were removed from Site and disposed in accordance with EPA requirements. This is because:

- The copies of tip dockets provided in the Demolition Clearance Report for the period 13/05/25 did not indicate:
  - The source of the asbestos waste and whether the loads came from the Milperra site;
  - Who transported the asbestos waste to Kemps Creek; and
  - No copies of the EPA Waste Tracking Forms were provided.

- The 2025 RAP[57] prepared by EGA advised that as part of the demolition work, friable asbestos contaminated soil was excavated from two locations at AEC02 and disposed off-site on 4/10/24. EGA advised that the quantity of friable contaminated soil that was excavated and removed off-site was 30 m^3 in-situ or 54 tonnes. However, tip dockets given in the Demolition Clearance Report did not include any asbestos waste removed from the Site in October 2024.
- The 2025 RAP[58] prepared by EGA advised that as part of the demolition work, friable asbestos contaminated soil was excavated from five locations at AEC01 and disposed off-site on 13/12/24. The EGA 2025 DSI[59] estimated the quantity of friable contaminated soil that needed to be excavated and removed off-site was 62.5 m^3 or 112.5 tonnes. However, tip dockets given in the Demolition Clearance Report did not include any asbestos waste being removed from the Site in December 2024.
- No documentation was provided in either the EGA 2025 DSI, the Demolition Clearance Report, or the 2025 RAP showing that the friable asbestos contaminated soil at these five locations in AEC01 were excavated.

Further comment on the significance of these data gaps is provided in **Section 3.8**.

3.8 Final Surface Soil Clearance Post Demolition

The Demolition Clearance Report[60] advised at the completion of demolition work within each zone, a clearance inspection of the soil surface was conducted within the building footprints and surrounding area. Raking was not undertaken and vegetation remained within the inspection area, which reduced the level of confidence achieved by the clearance inspection. The inspection did not comply with the recommended procedures specified in Section 11.2.2 of the NEPM (2013) Schedule B2 guidelines.

The Site Auditor addressed the deficiencies in the final clearance inspection by concluding that visible asbestos was likely to remain in surface soil across the disturbed areas of the Site where surface soil had been stripped during the demolition work, as shown in **Figure 2-48**. The risks posed by this contamination needed to be addressed by the remediation work.

3.9 Site Auditor Review

The Site Auditor considered that the weight of evidence of evidence supported the conclusion that the demolition work conducted at the Site between October 2024 and July 2025:

- Met Condition 1.3 of the Demolition Development Consent, since only structures from approved zones were demolished;
- Was close to meeting Condition 1.7 of the Demolition Development Consent. This is because clearance certificates for visible asbestos were issued for practically all buildings. The one exception for a clearance certificate was the removal of an electrical distribution box from Building 12. However, this one data gap was considered no to be significant given the small amount of work involved in removing this one box and the large number of clearance certificates that were issued;

[57] Section 4.10.2, Ref [12]
[58] Section 4.10.1, Ref [12]
[59] Table 15.1.2, Ref [11]
[60] Section 5.2, Ref [10]

- Was likely to have met or closely met Condition 3.6 of the Demolition Development Consent based on the data provided in the report and observations made by the Site Auditor during site inspections conducted prior to, during and after the completion of the demolition work;

However, the data gaps in waste disposal documentation meant that the Site Auditor was unable to conclude that the demolition work conducted at the Site met Conditions 2 and 3.13 of the Demolition Development Consent. Until these data gaps were addressed, the Site Auditor considered there was a risk that demolition waste generated after March 2025 was not properly managed, the friable contaminated soil at five locations at AEC01 either remained unexcavated or was excavated but placed in one or more of the soil stockpiles spread around the Site. The Site Auditor addressed this data gap by including the following condition on the Section B SAS:

> "*There are data gaps in the Demolition Clearance Report (Ref [10]) that need to be addressed concerning the removal and disposal of 112 tonnes of asbestos contaminated building and demolition (B&D) waste for the period 13/05/25 to 10/07/25, and the disposal of 54 tonnes and 113 tonnes of friable asbestos contaminated soil reportedly excavated and disposed off-site on 4/10/24 and 13/12/24, respectively (refer Section 3.7, SAR). These data gaps need to be addressed to the satisfaction of the Site Auditor prior to the commencement of remediation work at the Site.*

4. Review of 2025 RAP

This section of the SAR reviews a revised RAP prepared by EGA dated 24/10/25 (Ref [12]). The 2025 RAP advised[61] that it superseded an earlier version prepared by Alliance in 2022 (Ref [5]). The 2025 RAP was required to reflect the contamination assessments undertaken at the Site since 2022, in addition to capturing the changes to the site condition following demolition of onsite structures.

The Site Auditor initially reviewed an earlier version of the report dated 11/09/25, with review comments documented in an interim audit advice dated 15/10/25.

4.1 Basis for the 2025 RAP

4.1.1 RAP Objectives

The 2025 RAP[62] advised that its objectives were to:

- Prepare a RAP in line with the EPA guidelines for 'consultants reporting on contaminated land' in addition to local council contaminated land policy (Canterbury Bankstown 2017) to address the issues identified on the site and to provide a strategy to render the site suitable for the proposed development;
- Provide provision for supplementary contamination assessments to address data gaps identified in previous contamination assessments;
- Achieve an acceptable outcome that was technically, logistically and financially feasible;
- Summarise the findings of site contamination investigation reports and present a refined CSM;
- Document the identified contamination risks to human health and/or the environment;
- Define the extent of remediation required across the Site;
- Assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of ecologically sustainable development (**ESD**) principles;
- Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use;
- Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour and aesthetics);
- Address contingencies and unexpected finds protocols;
- Identify the necessary approvals and licences required by regulatory authorities including any items contained in development consent conditions;
- Clearly outline waste classification, handling and tracking requirements in accordance with the Guidelines for the NSW Site Auditor Scheme and Waste Classification Guidelines (EPA 2014);
- Ensure remediation was consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the RAP;

[61] Section 1.1, Ref [12]
[62] Section 1.3, Ref [12]

- Identify how successful implementation of the RAP would be demonstrated; and
- Provide a management framework that would give Council confidence that the remedial measures would be undertaken in accordance with the RAP, to make the site suitable for the proposed use.

The Site Auditor considered these objectives were consistent with regulatory requirements as given in the CLM Act, EPA guidelines, the R&H SEPP guidelines and Council's contaminated land policy (Ref [55]).

4.1.2 Remediation Goals

The remediation goal stated in the 2025 RAP[63] was to remediate potential soil contamination (where identified) to a level that did not present an unacceptable human health exposure or environmental risks, making the Site suitable for the proposed development. During remediation, consideration would be given to the following:

- ESD principles in line with Section 9 of the CLM Act;
- Minimising waste generation under the Waste Avoidance and Resource Recovery Act 2001;
- Management of site contingencies; and
- Protection of worker health and safety, environmental management, and community relations.

The Site Auditor considered the remediation goals specified by the 2025 RAP were consistent with the goals specified in EPA guidelines[64], the R&H SEPP, ESD principles specified in the CLM Act, and waste requirements.

4.1.3 R&H SEPP Planning Requirements

The R&H SEPP guidelines[65] specified four issues that a planning authority needed to consider when a RAP was received, these being:

- Can the site be appropriately remediated? Consider the RAP and any statement by the proponent's consultant certifying that remediation is practical. If necessary, consult a site auditor;
- Are the proposed remediation criteria appropriate for the future use of the site, considering possible human health and environmental impacts? Consult a site auditor if necessary, or check EPA guidelines;
- Are the proposed plans for remediation work acceptable? For example, do they include an occupational health and safety plan, site environmental management plan, community relations plan, contingency plan? For more information consult the section on RAPs in the EPA's guidelines (1997b); and
- Is a site audit of the RAP necessary?

These issues were also reflected in Council's contaminated land policy (Ref [55]).

[63] Section 9.1, Ref [12]
[64] Section 2.3, NSW EPA (August 2011) "*Guidelines for Consultants Reporting on Contaminated Sites*" and NSW EPA (March 2007) Groundwater Guidelines
[65] Section 3.5.4, SEPP55 guidelines

The Site Auditor considered this SAR met these requirements because the Site Auditor:

- Was engaged to conduct a statutory site audit to review the ESAs, RAP and eventually a site remediation and validation report (**SRVR**);
- Reviewed the feasibility of remediating contamination at the proposed residential subdivision;
- Reviewed the suitability of the proposed remediation criteria; and
- Reviewed the proposed plans for the remediation work.

4.1.4 EPA Remediation Policy

The EPA policy on the remediation of contaminated sites was specified by the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended in May 2013 ("NEPM guidelines"). The NEPM guidelines[66] advised that when assessing contamination, the site assessor and others should take into account the preferred hierarchy of options for site clean-up and/or management which was:

- "*on-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and*
- *off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,*

if the above are not practicable,

- *consolidation and isolation of the soil on site by containment with a properly designed barrier; and*
- *removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;*

or,

- *where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.*

When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option.

In cases where no readily available or economically feasible method is available for remediation, it may be possible to adopt appropriate regulatory controls or develop other forms of remediation.

It should be emphasised that the appropriateness of any particular option will vary depending on a range of local factors. Acceptance of any specific option or mix of options in any particular set of circumstances is therefore a matter for the responsible participating jurisdiction."

In this SAR, the Site Auditor assessed the 2025 RAP's compliance with EPA remediation policy.

[66] Section 16 in Volume 1 NEPM guidelines

4.2 Extent of Remediation Work Required

The 2025 RAP[67] provided a summary of the extent of contamination that needed to be remediated at the Site with a copy provided in **Table 4-1**, with plans showing the location and extent of remediation work provided in **Figures 4-1** to **4-5**.

Table 4-1 RAP Quantities of Contamination to be Remediated (Source: Tab 10.1.1, Ref [12])

ID	Area of Environmental Concern	Approximate Extent
AEC01	Friable Asbestos Impacted Fill Soils	25 m^2 x 0.5 m bgsl Total ≈ 12.5 m^3 / 22.5 tonnes
	Non-Friable Asbestos Impacted Fill Soils	3,950 m^2 x (0.2 to 0.7 m / average 0.5 m bgsl) 1,975 m^3 / 3,555 tonnes
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	1,000 m^2 x 0.25 m bgsl 250 m^3 / 450 tonnes *(Extent may vary following supplementary assessment)*
AEC02	Non-Friable Asbestos Impacted Fill Soils	10,425 m^2 x (0.1 to 1.2 m / average 0.5 m bgsl) 5,212.5 m^3 / 9,382.5 tonnes
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *4,156 m^3 / 7,480 tonnes*
AEC03	Non-Friable Asbestos Impacted Fill Soils	15,480 m^2 x (0.3 to 1.4 m / average 0.6 m bgsl) 9,288 m^3 / 16,718 tonnes
AEC05	Building Footprints (Assessed)	14,050 m^2 x (0.3 to 1.0 m / average 0.6 m bgsl) *8,430 m^3 / 15,174 tonnes*
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *7,626 m^3 / 13,726 tonnes*
AEC08	Risk of redundant fibre cement conduits and septic tanks within the site footprint	Site Footprint
AEC09	Risk of asbestos contamination within the site footprint	Site Footprint

[67] Section 10.1, Ref [12]

Figure 4-1 AECs across Site from 2025 RAP (Source: Fig 2, Ref [12])

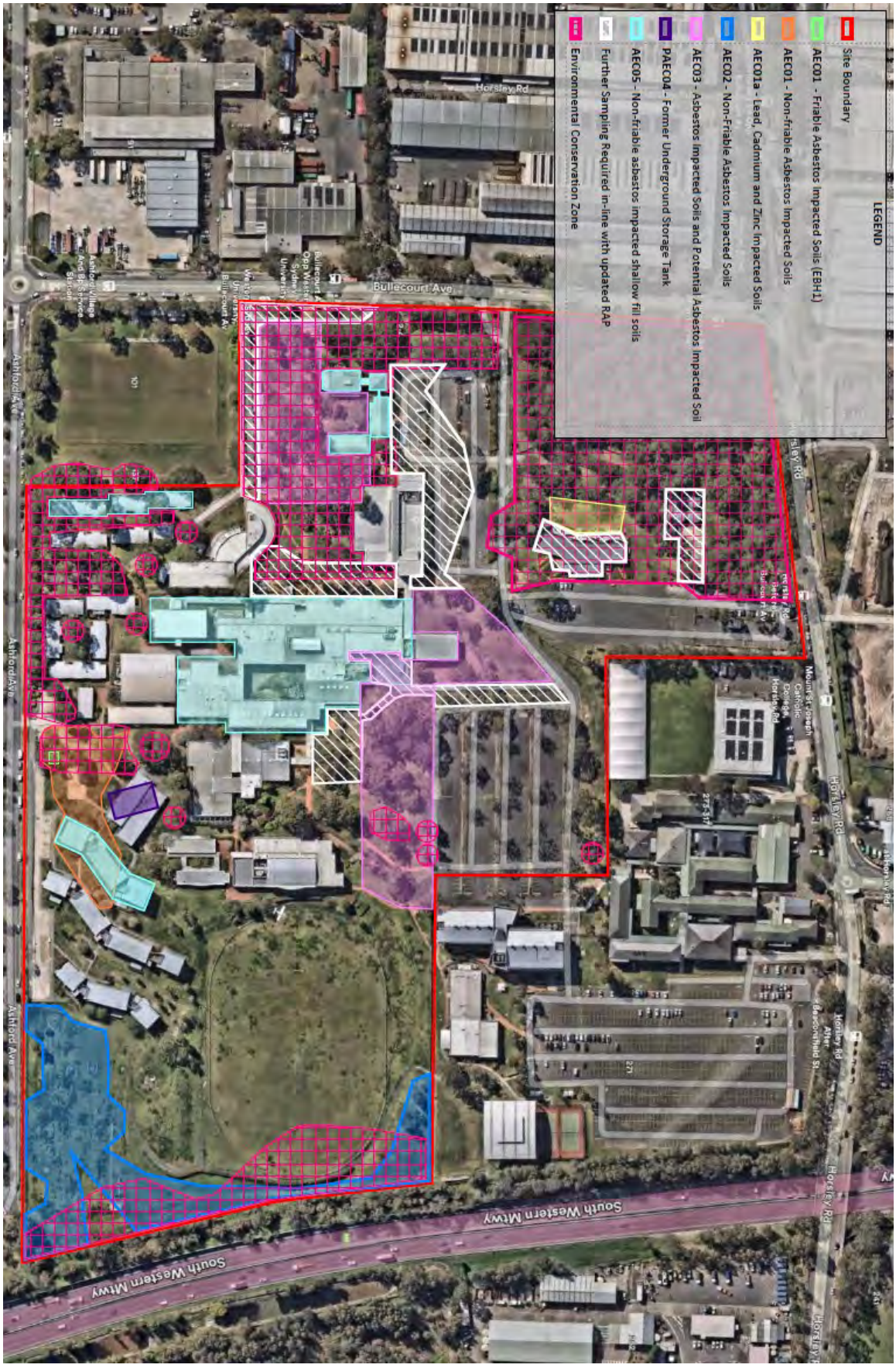


Figure 4-2 Extent of Remediation Required at AEC01 from 2025 RAP (Source: Fig 3, Ref [12])



Figure 4-3 Extent of Remediation Required at AEC02 from 2025 RAP (Source: Fig 4, Ref [12])

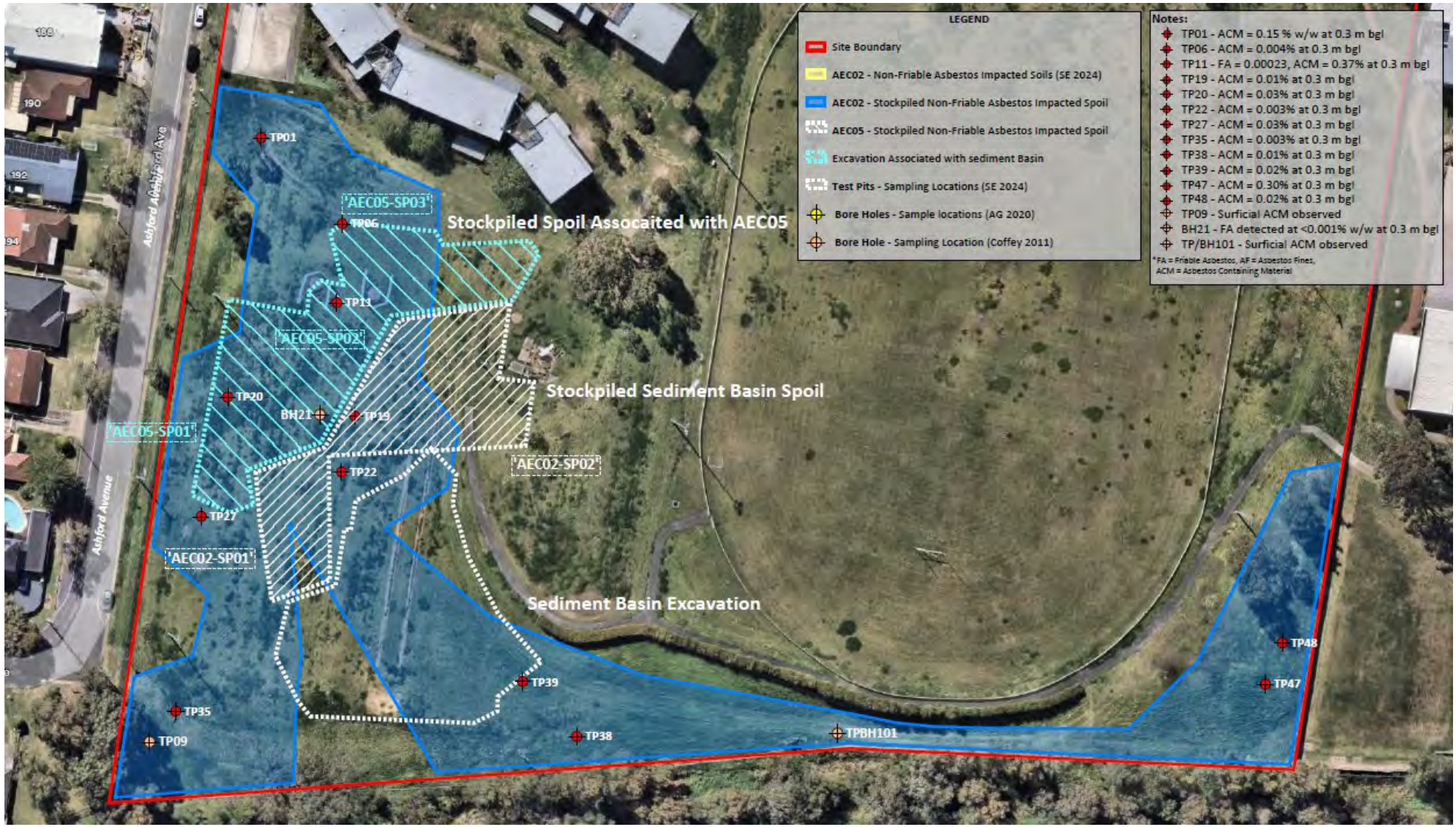


Figure 4-4 Extent of Remediation Required at AEC03 from 2025 RAP (Source: Fig 5, Ref [12])

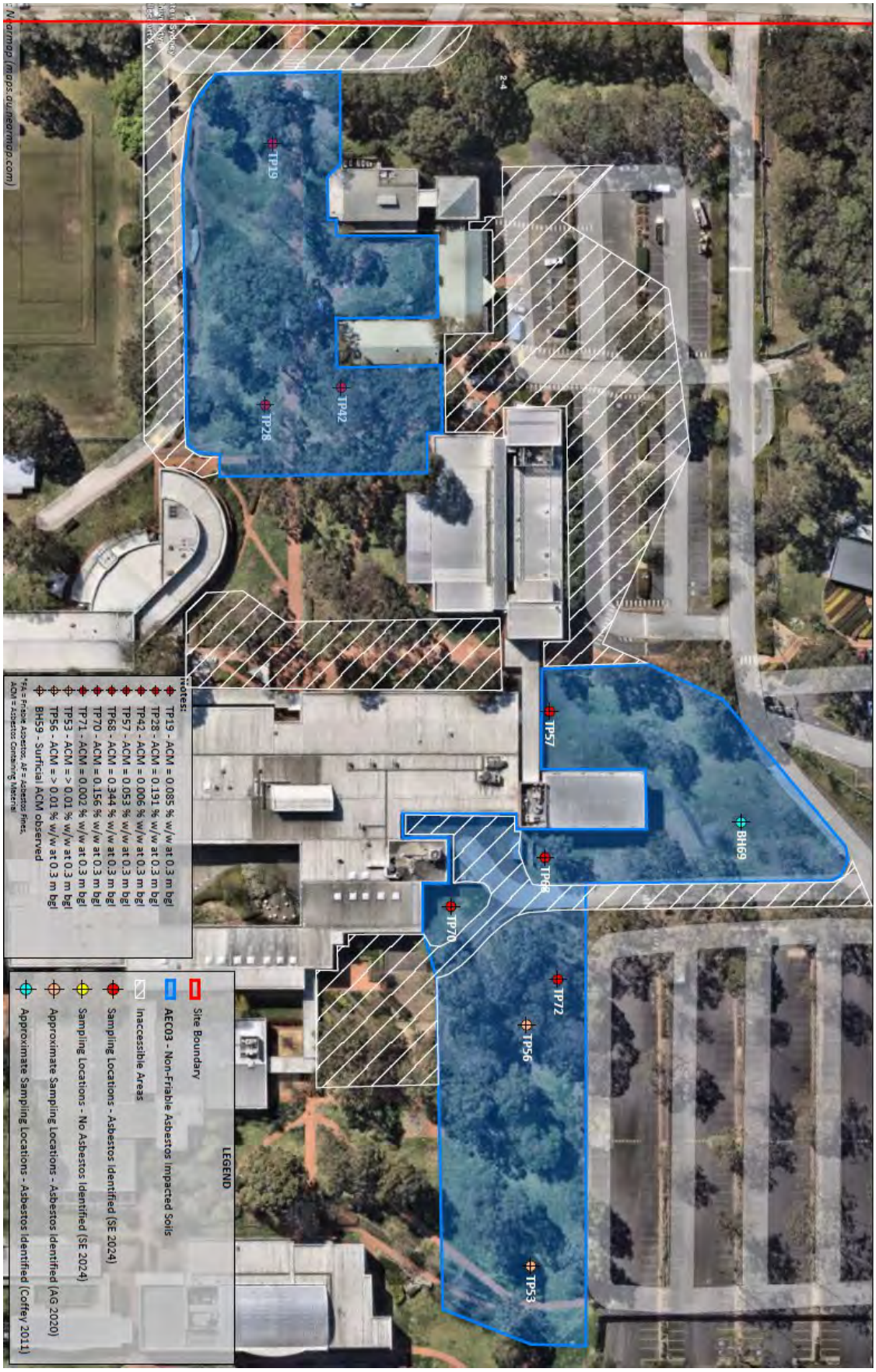


Figure 4-5 Extent of Remediation Required at AEC05 from 2025 RAP (Source: Fig 6, Ref [12])



The Site Auditor considered the quantities provided by the 2025 RAP of contamination needing to be remediated should be considered as lower-bound estimates because:

- **AEC01**: Bonded and friable asbestos for the reasons given in **Section 2.13.2**, namely:
  - Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025, which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling/excavation work;
  - The inherent limitations of discrete sampling methods;
  - The presence of asbestos in fill at AEC01 as reported by the ESAs; and
  - The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC01 was 0.5 m (EBH1) but the maximum depth was at least 1.40m (TP17);
  - Friable asbestos was found at a high proportion of sample locations at AEC01; and
  - It was unlikely that the extent of friable asbestos at AEC01 was limited to a 5x5m area at the six locations where it was found.

- **AEC01**: Uncertainties remained as to whether all waste materials, including hazardous building waste, were removed from Site and disposed in accordance with EPA requirements as previously discussed in **Section 3.7**. This is because:
  - The copies of tip dockets provided in the Demolition Clearance Report for the period 13/05/25 did not indicate the source of the asbestos waste and whether the loads came from the Milperra site; who transported the asbestos waste to Kemps Creek; and, no copies of the EPA Waste Tracking Forms were provided;
  - The 2025 RAP prepared by EGA advised that as part of the demolition work, friable asbestos contaminated soil was excavated from five locations at the Site and disposed off-site on 13/12/24. The EGA 2025 DSI estimated the quantity of friable contaminated soil that needed to be excavated and removed off-site from these five locations at AEC01 was 112.5 tonnes. However, the tip dockets given in the Demolition Clearance Report did not include any asbestos waste being removed from the Site in December 2024; and
  - No documentation was provided in either the EGA 2025 DSI, the Demolition Clearance Report, or the 2025 RAP showing that the friable asbestos contaminated soil at these five locations in AEC01 were excavated.

- **AEC02**: Bonded and friable asbestos for the reasons given in **Section 2.13.4**, namely:
  - Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025, which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling/excavation work;
  - The inherent limitations of discrete sampling methods;
  - The presence of asbestos in fill at AEC02 as reported by the ESAs;

- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC02 was >0.70 m (TP12) but the maximum depth was at least 1.70m (TP48);
- It was unlikely that the extent of friable asbestos at AEC02 was limited to a 5x5m area at the six locations where it was found;
- The EGA 2025 DSI advised that the friable asbestos contamination at EBH24 and EBH25 was excavated and disposed off-site as part of work to construct a sediment basin in the area, as shown in Figure 2-44. EGA advised that 200 m3 of friable asbestos contaminated soil was excavated and disposed off-site from these two areas, which was four times the volume predicted by EGA; and
- The data provided by the EGA 2025 DSI on the removal of friable asbestos contaminated soil from EBH24 and EBH25 did not meet the documentation completeness DQO because of the following data gaps: A description of how sample locations EBH24 and EBH25 were relocated and the soils excavated, transported and disposed off-site; descriptions and photos of subsurface conditions revealed by the excavations; a waste classification report; material tracking data; waste tip dockets; and, validation data for the excavation.

➢ **AEC02**: Uncertainties remained as to whether all waste materials, including hazardous building waste, were removed from Site and disposed in accordance with EPA requirements as previously discussed in **Section 3.7**. There is a risk that asbestos waste from the demolition work and/or friable asbestos contaminated soil excavated from five of the hot-spots at AEC01 were not disposed off-site but was placed in stockpiles that remain at the Site.

➢ **AEC03**: Bonded and friable asbestos for the reasons given in **Section 2.13.5**, namely:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025, which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling / excavation work;
- The inherent limitations of discrete sampling methods;
- The test pit logs showed that the minimum depth of asbestos contaminated fill at the sample locations in AEC03 was 0.5 m (TP19) but the maximum depth was at least 1.50m (TP72); and
- The presence of friable asbestos at other AECs.

➢ **AEC05**: Bonded and friable asbestos for the reasons given in **Section 2.13.7**, namely:

- Deficiencies in the Alliance / SEG / EGA investigations undertaken between 2020 and 2025, which included: no grid-based surveys were conducted across the Site, absence of some test pit logs, errors in some borehole / test pit logs, and insufficient details provided on the procedures used to examine for visible asbestos in recovered soils during sampling/excavation work;
- No bulk gravimetric tests were reported to have been conducted;
- The inherent limitations of discrete sampling methods; and

- The disturbance of soils following demolition work and the lack of data showing how this work was undertaken. These data gaps included details on the locations where soils were scraped, how the soils were scraped, transported and stockpiled;
- The presence of friable asbestos at other AECs.

- **AEC05**: Uncertainties remained as to whether all waste materials, including hazardous building waste, were removed from Site and disposed in accordance with EPA requirements as previously discussed in **Section 3.7**. There is a risk that asbestos waste from the demolition work and/or friable asbestos contaminated soil excavated from five of the hot-spots at AEC01 were not disposed off-site but was placed in stockpiles that remain at the Site.
- **AEC08:** The extent of buried services and abandoned septic tanks at the Site.
- **AEC09**: The extent of presently unknown asbestos contaminated fill across the Site.

The Site Auditor addressed the need to manage uncertainties regarding the extent of contamination at the Site when reviewing the preferred remediation strategy in **Section 4.X**.

4.3 Remediation Criteria

4.3.1 COPCs in Soils

The 2025 RAP[68] advised that the proposed development had a range of land uses that would affect the soil remediation criteria adopted by the remediation work. The adopted criteria and land uses were specified as:

- HIL A for low-density residential areas;
- HIL C for open space / parkland areas; and
- HIL D for road corridors.

The asbestos criteria specified by the 2025 RAP are summarized in **Table 4-2**.

Table 4-2 Asbestos Remediation Criteria (Source: Table 6.2.3, Ref [12])

Analyte	Health Screening Level Residential A (Residential Lots)	Health Screening Level Residential C (Parkland)	Health Screening Level Residential D (Roadways)
Non-friable Asbestos	0.01 (% w/w)	0.02 (% w/w)	0.05 (% w/w)
Friable Asbestos (Asbestos Fines / Fibrous Asbestos)	0.001 (% w/w)		
All Forms of Asbestos	No visible asbestos on surface soils		

These remediation criteria would be applied as follows:

- Off-site disposal for soil contaminated above commercial / industrial HIL D criteria;
- Re-use of treated soils as fill along road corridors if contaminated at or below commercial / industrial HIL D criteria;

[68] Section 6.2, Ref [12]

- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below recreational EIL C criteria if placed at a depth of 0 to 2m below the final ground level;
- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below recreational HIL C and EIL C criteria if placed at a depth of more than 2m below the final ground level;
- Re-use of treated soils as fill on low-density residential land if contaminated at or below residential EIL A criteria if placed at a depth of 0 to 2m below the final ground level;
- Re-use of treated soils as fill on low-density residential land if contaminated at or below residential HIL A and EIL A criteria if placed at a depth of more than 2m below the final ground level; and
- Soil materials treated ex-situ for bonded asbestos would be assessed against the criteria most appropriate for the land-use where the materials are proposed for reuse within the Site. Treated bonded asbestos soils were not proposed for re-use within residential lots.

The Site Auditor considered the application of EILs to the upper 2 m of soil met EPA guidance because Section 2.5.6 of the NEPM (2013) Schedule B(2) guideline states that "*EILs apply principally to contaminants in the top 2 m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 m depth.*"

The Site Auditor considered the soil remediation criteria adopted by the 2025 RAP were appropriate and met EPA guidance provided:

- The criteria also applied to soils in tree protection zones, unless the soils were to be managed under a long-term environmental management plan (**LTEMP**);
- No visible asbestos was to remain in surface soil (top 10 cm);
- All existing stockpiled soil was treated to remove asbestos, in order to address the risk that asbestos contaminated soil stripped and stockpiled during the demolition work period was mixed and diluted with uncontaminated soil;
- Hotspots caused by chemical COPCs were defined by concentrations ≥ 250% x SIL; and
- Statistical criteria were applied to areas where chemical COPCs were remediated. These criteria included the 95% upper confidence limit (**UCL**) of the arithmetic mean, the standard deviation (**SD**) ≤ SIL, and the coefficient of variation (**COV**) ≤ 1.2);

4.3.2 Aesthetic Criteria

The 2025 RAP[69] adopted aesthetic criteria that allowed non-hazardous inert foreign materials within soil or fill subject to compliance within the site adopted criteria and aesthetic suitability (malodorous soils, discoloured chemical deposits, stained soil, large monolithic deposits/large inert foreign matter, putrescible refuse and animal remains). However, the limit on inert foreign material in soil was 5%.

The Site Auditor considered these criteria met EPA guidance.

[69] Section 6.3, Ref [12]

4.3.3 LFG

The 2025 RAP[70] advised that LFG investigation levels given by the EPA (2020) "*Assessment and management of hazardous ground gases*" were adopted as remediation criteria.

4.3.4 Imported Soil

The 2025 RAP[71] advised that imported soil must meet the Virgin Excavated Natural Material (**VENM**) or Excavated Natural Material (**ENM**) criteria specified by the EPA 2014 Waste Classification Guidelines and EPA 2014 'The Excavated Natural Material Order'. Landscaping soils imported to the Site as part of development work needed to meet:

- The Australian Standard AS4454 for compost, soil conditioners, and mulches;
- Contain no asbestos;
- Meet all EPA and Council requirements; and
- Be managed under the NSW Resource Recovery Framework, which included:
  - Processing: Wastes must be processed appropriately before they can be reused;
  - Testing: Products must be tested to ensure they are fit-for-purpose and free from harmful contaminants; and
  - Specifications: Processors and users must adhere to specifications outlined in Resource Recovery Orders and Exemptions regarding the end product and its use.

The Site Auditor considered these criteria met EPA guidance.

4.3.5 Geotechnical Soil Criteria

The 2025 RAP provided no geotechnical criteria that needed to be met by excavated soil that needed to be reused at the Site.

The Site Auditor considered there was a need for geotechnical criteria to be specified for excavated soils that were to be reused at the Site. This is because:

- There was a risk that asbestos contaminated soil already excavated and stockpiled at the Site and/or asbestos contaminated soil still to be excavated may be geotechnically unsuitable for reuse at the Site; and
- Asbestos contaminated soil that could not reasonably be treated and made geotechnically suitable would need to be disposed off-site at a suitably licensed landfill.

The Site Auditor addressed this data gap in the 2025 RAP by including the following condition on the Section B SAS:

> *"A set of geotechnical criteria need to be developed that would define those soils that could be reused on-site and those soils that would need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria need to be developed by a competent geotechnical*

[70] Section 6.4, Ref [12]
[71] Section 6.6, Ref [12]

engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site."

4.4 Assessment of Remediation Technologies and Selection of Preferred Strategy

4.4.1 Constraints Posed by the Primary Contaminant of Concern

The 2025 RAP[72] advised that the primary contaminant of concern at the Site was asbestos because of the potentially large quantity of soil likely to be impacted at the Site and the high cost of disposing asbestos waste to landfill in NSW. The remediation of asbestos impacted soils was complex due to the practical constraints in locating and treating asbestos contamination. These practical constraints arise because of:

- The difficulty in predicting where asbestos fragments were located across the ground surface and in fill; and
- The difficulty in identifying the location and extent of asbestos contamination using discrete sampling methods.

The Site Auditor considered the available data supported the identification of asbestos as the primary contaminant of concern at the Site, as shown by the reviews documented in **Section 2**.

The Site Auditor considered the practical constraints identified by the 2025 RAP concerning the remediation of asbestos were important and needed to be addressed when designing a preferred remediation strategy together with the following additional constraints:

- The inability of any remediation technique to ensure that no asbestos remained buried in fill while at the same time ensuring the preferred remediation strategy met ESD principles;
- The potential for excavated soil to become cross-contaminated when inadvertently mixed with uncontaminated soils;
- The potential for stripped surface soil from asbestos impacted areas to be geotechnically unsuitable for reuse at a Site, making it necessary to dispose of the soil off-site as Asbestos Waste;
- The need to remove visible asbestos found during earthworks; and
- The remediation criteria was demanding as it required that no visible asbestos remained in surface soil (top 10 cm) for any future land use.

4.4.2 Strategies to Address Remediation Constraints

The 2025 RAP[73] advised that strategies were adopted to minimise, to the extent practicable, the potential impact of the constraints described above. These strategies included:

- Designing the preferred remediation strategy and preparing this RAP after comprehensive investigations had been conducted across the Site, which identified the main areas of asbestos contaminated fill that required remediation. These investigations also identified the areas of the Site where there was a low risk of significant asbestos contamination;

[72] Section 9, Ref [12]
[73] Section 9, Ref [12]

- Having practically all the above ground buildings demolished as permitted by the Development Consent, which allowed hazardous buildings materials to be disposed off-site, the presence of visible asbestos cleared from building footprints, and the condition of the soils across building footprints to be investigated;
- Developing a methodical sequencing of remediation tasks;
- Tracking excavated soils from cradle-to-grave;
- Adopting remediation criteria for treated soils based on managing risk in accordance with EPA guidance; and
- Following the removal and remediation of known asbestos contamination in an area, protocols were adopted by the bulk earthworks / civil works to manage and remove isolated, infrequent ACM fragments as they were found.

The Site Auditor considered the strategies adopted by the 2025 RAP to address the practical constraints posed by asbestos remediation were important and needed to be considered when designing a preferred remediation strategy together with the following additional strategies:

- Selective excavation to minimise the potential for clean soils to become mixed with asbestos contaminated soil and/or become geotechnically unsuitable for on-site reuse; and
- Designing on-site soil treatment methods that would maximise the reuse of contaminated soils and minimise the generation of waste needing to be disposed off-site.

4.4.3 Preferred Hierarchy of Remediation Methods

The 2025 RAP[74] advised that in general, the preferred hierarchy of options for site remediation and/or management specified by EPA guidance is set out in the NEPM. This preferred hierarchy was:

- On-site treatment of the contamination so that it was destroyed or the associated risk reduced to an acceptable level; and
- Off-site treatment of excavated soil, so that the contamination was destroyed or the associated risk reduced to an acceptable level, after which soil was returned to the site; or,

if the above were not practicable:

- Consolidation and isolation of the soil on-site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material; or
- Where the assessment indicated remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option.

[74] Section 9.2, Ref [12]

The 2025 RAP further advised that these options were considered in light of the known conditions on the Site and the practicality and cost associated with on-site treatment, off-site treatment and wholesale excavation. In the case of the latter removal of all materials would simply burden another site and comprise a waste of diminishing landfill resources and would in any event be contrary to the principals of waste minimisation and sustainability espoused by the EPA. Moreover, the ability to reuse treated soils on-site complied with EPA's waste hierarchy as follows:

- Waste Avoidance - including action to reduce the amount of waste generated by households, industry and all levels of government;
- Resource recovery - including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources; and
- Waste disposal - including management of all disposal options in the most environmentally responsible manner.

The 2025 RAP advised that it evaluated remediation options for the main type of contaminated soil needing to be remediated, being bonded asbestos impacted fill. For other types of soil contamination that may be found at the Site, appropriate remediation strategies will be developed, if required.

The Site Auditor considered that there were three main types of asbestos contaminated soil that needed to be remediated at the Site and for which remediation strategies needed to be developed and documented in a RAP. These were:

- Bonded asbestos impacted fill – geotechnically suitable for reuse in present condition;
- Bonded asbestos impacted fill – geotechnically unsuitable for reuse in present condition; and
- Friable asbestos impacted fill.

4.4.4 Assessment of Remediation Options

The Site Auditor considered that the remediation options relevant to asbestos contaminated soil were:

- Option 1: Do nothing;
- Option 2: On-site treatment to an acceptable level and reuse;
- Option 3: Excavation and containment on-site in a capped cell;
- Option 4: Leave in-situ and cover with a clean soil cap; and
- Option 5: Off-site disposal to landfill.

The 2025 RAP[75] advised that Mirvac preferred that the remedial works be undertaken in a manner that did not result in the need for:

- Notation on a planning certificate for the Site;
- A covenant registered on the title to the land; or
- An LTEMP.

[75] Section 9.3, Ref [12]

This meant that remedial options NOT considered by the 2025 RAP were Options 1, 3 and 4. An assessment of Options 2 and 5 was documented in the 2025 RAP, with a copy of the remedial options summary provided in **Table 4-3**.

Table 4-3 Remedial Options Summary Provided in 2025 RAP (Source: Table 9.4.1, Ref [12])

Treatment Option	Description	Advantages			Disadvantages		
		Technical	Financial	Logistical	Technical	Financial	Logistical
On-site Treatment	Soil raked and picked of physical contaminants. Treated and validated materials beneficially reused within the site.	Direct access to soil will be restricted by local roadways, foot paths and park areas with the appropriate mitigation measures	Potentially lower costs through with efficient / strategical methodology	Moderate excavation is required to remove all the AECs across the entire site Limited environmental management required during the works (e.g. dust, noise)	Treated and validated materials would remain on-site. Materials to be beneficially re-used within limited access areas (beneath roadways, parks, and footpaths)	Moderate to high labour costs during raking / picking of soils	Treated and validated material would remain on-site indefinitely.
Excavation and Offsite Disposal	Removal of contaminated soil to an EPA licensed facility. Validation sampling to demonstrate the conditions of the residual soil impact. Reinstatement of excavated areas with material validated as suitable for the intended land use.	Protective of human health including future tenants and construction workers. Facilitate future development of the entire site. No long-term EMP will be required.	No onsite operation and maintenance required.	No ongoing management required as the impacted soil will have been removed offsite.	Based on the soil investigation results, for off-site disposal purposes, the impacted soil to be excavated and removed offsite would require waste classification in accordance with the NSW EPA *Waste Classification Guidelines 2014.*	High remedial cost incurred to remediate the entire site.	Major excavation is potentially required. Odour, vapour and dust management required during the excavation works. May increase truck traffic in area to transport contaminated soil for a short period of time.

The Site Auditor considered that the remedial options assessment provided by the 2025 RAP was deficient because the RAP did not consider the existing or potential geotechnical suitability of asbestos contaminated soils for reuse at the Site. If asbestos contaminated soil was not geotechnically suitable for re-use at the Site prior to on-site treatment to remove asbestos, then an assessment needed to be made to determine whether the asbestos contaminated soil could be made geotechnically suitable after asbestos had been removed. If soils could not be made geotechnically suitable after asbestos treatment for reuse at the Site, then there was no point in treating the soil to remove asbestos. In this case the soil should be disposed off-site to a licensed waste facility.

Australian Standard AS3798-2007 "*Guidelines on earthworks for commercial and residential developments*" advises that materials that are unsuitable for forming structural fill include, among others:

- Organic soils, such as many topsoils, severely root-affected subsoils;
- Silts, or materials that have the deleterious engineering properties of silt; and
- Fill that contains wood, metal, plastic, boulders or other deleterious material in sufficient proportions to affect the required performance of the fill.

The Site Auditor considered there was a risk that a significant portion of the 11,782 m^3 of stockpiled soil at the Site may have been geotechnically unsuitable for reuse as engineered fill. Such soil would need to be either processed by a power screen to remove geotechnically unsuitable material after visible asbestos had been removed, or the soil needed to be disposed off-site to a licensed waste facility. Such additional work could impact the manner in which asbestos contaminated soil at the Site was remediated and how bulk earthworks were planned and executed.

To address this deficiency in the 2025 RAP, the Site Auditor included the following conditions on the Section B SAS:

> "*There is a risk that a significant portion of the 11,782 m3 of stockpiled soil at the Site may be geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos had been removed or the geotechnically unsuitable soil needed to be disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils need to be undertaken and then a work plan prepared that documents a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The work plan then needs to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site."*
>
> *"A set of geotechnical criteria need to be developed that would define those soils that could be reused on-site after asbestos had been removed, soils that could be reused after asbestos and unsuitable materials had been removed, and those soils that would need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria need to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site."*

4.4.5 Overview of Proposed Remediation Strategy

The 2025 RAP[76] advised that:

- A methodical sequencing of remediation phases was an important strategy adopted by this RAP to minimise, to the extent practicable, the potential impact of the constraints associated with remediation of asbestos contamination.
- A generic sequencing of remediation phases was developed so that each could be applied to any stage of the development. The sequencing of tasks sought to provide a logical order that remediation work should be undertaken irrespective of the type and extent of contamination that may be present in a stage. Where a remediation phase was not relevant for a particular Development Stage, then the next remediation phase would be considered and so on until the particular Development Stage had been fully remediated and validated. When this outcome had been reached, the land would be considered suitable for the proposed land use/s and a validation report would be prepared that would allow a Section A SAS / SAR to be issued followed by the commencement of above ground construction work.
- The remediation of contamination in an area of the Site and the validation of its final condition as being suitable for the proposed land uses could only be completed when final site levels had been reached and no further bulk earthworks were required. This is because of the need to ensure that:
  - All soils used as backfill at the Site had been tracked from cradle-to-grave;
  - Only treated soils validated as meeting the remediation criteria were used as backfill;
  - Any isolated fragment of asbestos found during the excavation of soil not requiring remediation had been removed and validated;
  - Surface soils that formed the final site level contained no visible asbestos;
  - Imported soils used in bulk earthworks met the EPA criteria for VENM and ENM; and
  - Imported landscaping soils met the remediation criteria.
- It was critical for the contractor to fully understand the requirements of the RAP and to manage the remediation and movement of soils at the Site in accordance with this RAP.
- Both remediation work and bulk earthworks would need to be undertaken in parallel at different parts of the Site and sequenced in a manner to facilitate the staging plan of the proposed development.
- Validation reports would need to be prepared by the environmental consultant and site audit documentation prepared by the Site Auditor progressively as final site levels were achieved at a particular stage of the development.

The Site Auditor considered that these features of the proposed remediation strategy were appropriate for the type of contamination problems at the Site and the nature of the proposed development.

[76] Section 10.2, Ref [12]

4.5 Remediation Work Sequencing and Procedures

4.5.1 Task Breakdown Structure

The 2025 RAP[77] organised the remediation work into the following phases / tasks:

- Phase 1: Early works and tree protection
- Phase 2: Further investigation of groundwater and LFG
- Phase 3: Additional demolition and supplementary assessment within AEC01a, AEC01, AEC03, AEC04, AEC05
- Phase 4: Remediation of asbestos and heavy metal contamination
  - 4.1 Stockpile bonded asbestos impacted fill
  - 4.2 Friable asbestos impacted fill
  - 4.3 Bonded asbestos impacted fill
  - 4.4 Other types of contamination and Unexpected Finds
  - 4.5 Decommissioning asbestos treatment area
  - 4.6 Remediation contingencies
  - 4.7 Hold point
- Phase 5: Management of contamination risks during bulk earthworks:
  - 5.1 Excavate remaining soils to final excavation level
  - 5.2 Placement / re-use of treated soils at depth
  - 5.3 Import VENM or ENM soil to fill areas
  - 5.4 Final surface soil inspection

The 2025 RAP[78] estimated that the remedial works would take 12-18 months to complete.

4.5.2 Phase 1 Early Works and Tree Protection

The 2025 RAP[79] specified the following early work that needed to be completed prior to the commencement of sitework:

a) Preparation of a site-specific Safe Work Method Statement (**SWMS**);

b) Preparation of a site-specific Work Health & Safety (**WHS**) Plan by the Principal Contractor;

c) Preparation of a Construction Environmental Management Plan (**CEMP**);

d) Preparation of a material tracking system by the Principal Contractor to track all contaminated soil and sediment materials from cradle-to-grave;

e) All environmental and WHS measures needed to be established and implemented at the Site (e.g. erosion sediment control measures);

[77] Section 10.3, Ref [12]
[78] Section 10.4, Ref [12]
[79] Section 10.4, Ref [12]

f) Tree protection zones (**TPZ**) needed to be established around the drip line of existing trees within the Site. Exclusion fencing would be used as a physical barrier demarcating TPZ's. No works were to be undertaken within the tree protection zones as part of the Category 2 remedial scope;

g) A project inception meeting needed to be held between the developer, Remediation / Civil Contractor, Environmental Consultant and Site Auditor;

h) Submission of a notification of an intention to undertake remediation works on the site to the relevant planning consent authority 30 days prior to remediation works commencing;

i) Provision of the following information to the planning consent authority 14 days prior to the commencement of remediation works:

- Copies of the contamination assessment report and this RAP;
- Contact details of the contractor appointed to undertake the remediation works; and
- Contact details of the parties responsible (if not the remediation contractor) for ensuring remediation works would comply with relevant regulatory requirements.

j) The Principal Contractor needed to obtain specific related approvals as necessary to implement the works (e.g. a notification needed to be submitted to SafeWork NSW at least 5 days in advance to undertaking any asbestos removal works).

k) **Phase 1 Hold Point**: No Phase 3 work in any part of the Site was to occur until the environmental consultant had advised the Site Auditor in writing that all other Phase 1 early work has been completed, and the Site Auditor had reviewed and approved the Phase 1 documentation and issued a written approval for Phase 3 work to proceed.

The Site Auditor considered the early work specified by the 2025 RAP was generally appropriate and met regulatory requirements provided it also included measures to address:

l) Data gaps in the Demolition Clearance Report (Ref [10]) concerning the removal and disposal of 112 tonnes of asbestos contaminated building and demolition (B&D) waste for the period 13/05/25 to 10/07/25, and the disposal of 54 tonnes and 113 tonnes of friable asbestos contaminated soil reportedly excavated and disposed off-site on 4/10/24 and 13/12/24, respectively (**Section 3.7**);

m) A copy of the EGA (14/10/24 & 20/12/24) reports on early remediation work at friable asbestos hot-spots at AEC01 and AEC02 needed to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work could be assessed prior to the commencement of remediation work at the Site;

n) There was a risk that a significant portion of the 11,782 m^3 of stockpiled soil at the Site was geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos had been removed or the geotechnically unsuitable soil needed to be disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils needed to be undertaken and then the RAP revised to provide a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The revised RAP then needed to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site;

o) A set of geotechnical criteria needed to be developed that would define those soils that could be reused on-site after asbestos had been removed, soils that could be reused after asbestos and unsuitable materials had been removed, and those soils that would need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria needed to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site.

p) EGA advised the Site Auditor during the 27/10/25 site inspection that work plans had been prepared that provided more detail on how the remediation work was to be implemented. It was important for the Site Auditor to review and approve these work plans prior to the commencement of sitework.

q) A dedicated asbestos treatment area was proposed by the 2025 RAP to treat soils contaminated by bonded asbestos. The Site Auditor considered that this was an important facility that needed to be properly designed and operated, however no such details were provided in the 2025 RAP. This data gap was addressed by the Site Auditor requiring the design and proposed operation of the dedicated asbestos treatment area to be documented in a work plan that needed to be reviewed and approved by the Site Auditor prior to the commencement of sitework.

r) A detailed contingency plan needed to be developed and completed by the Mirvac Project Team as part of Phase 1 work, with a copy to be provided to the Site Auditor prior to the commencement of site work.

s) The 2025 ESA[80] advised that:

- Remedial works would be carried out up to the boundary of tree protection zones, or where root systems were encountered, whichever occurred first. Where contamination was found to extend within the TPZ, further management would be required as part of future works completed under a Category 1 approval during the bulk earthwork stage for the project; and
- Investigation and remedial scopes within the Northern Conservation Zone would be completed as part of the future Category 1 works proposed during bulk earthworks. Land Identified on the Biodiversity Values Mapping will remain undisturbed as

The Site Auditor considered that strategies for the remediation of contamination with tree protection zones and the Northern Conservation Zone needed to be prepared and submitted to the Site Auditor for review as part of the Phase 1 early work, in order that sufficient time is given to obtaining the necessary regulatory approvals.

The Site Auditor addressed the need for this additional Phase 1 early work by including the following conditions on the Section B SAS:

> *"There are data gaps in the Demolition Clearance Report (Ref [10]) that need to be addressed concerning the removal and disposal of 112 tonnes of asbestos contaminated building and demolition (B&D) waste for the period 13/05/25 to 10/07/25, and the disposal of 54 tonnes and 113 tonnes of friable asbestos contaminated soil reportedly excavated and disposed off-site on 4/10/24 and 13/12/24, respectively (refer Section 3.7, SAR). These data gaps need to be addressed to the satisfaction of the Site Auditor prior to the commencement of remediation work at the Site."*

[80] Section 10.4.2, Ref [12]

"A copy of the EGA (14/10/24 & 20/12/24) reports on early remediation work at friable asbestos hot-spots at AEC01 and AEC02 needs to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work can be assessed prior to the commencement of remediation work at the Site."

"There is a risk that a significant portion of the 11,782 m^3 of stockpiled soil at the Site may be geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos had been removed or the geotechnically unsuitable soil needed to be disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils need to be undertaken and then a work plan prepared that documents a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The work plan then needs to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site."

"A set of geotechnical criteria need to be developed that would define those soils that could be reused on-site after asbestos had been removed, soils that could be reused after asbestos and unsuitable materials had been removed, and those soils that would need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria need to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site."

"No remediation work is to commence at the Site until the Site Auditor has received, reviewed and provided written approval all work plans prepared for the remediation work."

"The project environmental consultant needs to prepare remediation strategies for contamination within tree protection zones and the Northern Conservation Zones and provide them to the Site Auditor for review prior to the commencement of remediation work at the Site."

4.5.3 Phase 2 Further Investigation of Groundwater and LFG

The 2025 RAP[81] advised that further investigation of groundwater and LFG was needed at the Site involving:

a) AEC06: A supplementary contamination assessment needed to be undertaken to determine whether off-site hazardous ground gases were migrating on-site requiring further management. Two ground gas monitoring wells needed to be installed within the southern portion of the Site and a gas monitoring event conducted to determine whether further management was required.

b) AEC07: A supplementary groundwater investigation and contamination assessment will be undertaken to determine whether off-site contamination associated with nearby industrial activities was migrating onsite requiring further management. This work would involve undertaking an additional groundwater monitoring event at the eight existing wells.

c) **Phase 2 Hold Point**: Phase 3 works were not to commence until:

- The environmental consultant had issued a contamination assessment report prepared in accordance with EPA guidance documenting the LFG investigation and assessment;

[81] Sections 8.7.3, 8.7.4 & 10.5, Ref [12]

- In the event that LFG concentrations exceeded the site assessment criteria, the investigation needed to determine the risk that LFG posed to the proposed development and detail any remedial measures required.

The Site Auditor considered the scope and requirements of the Phase 2 work were acceptable and would provide additional data on site conditions.

4.5.4 Phase 3: Additional demolition and supplementary assessment within AEC01a, AEC01, AEC03, AEC04, AEC05

The 2025 RAP[82] advised that:

a) Parts of the Site remained covered by hardstand and asphalt and the underlying soils needed to be assessed. All additional demolition works needed to be completed in accordance with the CEMP and the RAP. Surface soil within the footprint of all hardstand areas needed to be visually assessed following the completion of demolition work.

b) AEC01a: A supplementary contamination assessment needed to be undertaken within AEC01a, within the previously identified lead, cadmium and zinc area. Asbestos also needed to be assessed.

c) AEC01: A supplementary investigation was required to delineate the extent of friable asbestos impacted soil previously identified at sampling point 'EBH1'. Four test pits needed to be advanced north, south, east and west of 'EBH1' with 500ml soil samples collected from 0.5mbgl and submitted for quantitative asbestos analysis. In the event friable asbestos was identified beyond the soils immediately adjacent 'EBH1' (5 m x 5 m), further sampling needed to be undertaken to fully characterise the lateral extent of impacts.

d) AEC03: At the time of previous assessments within AEC03, 9,300 m^2 remained covered by hardstand and required assessment prior to the commencement of remediation in these areas. Nineteen test pits would be used.

e) AEC04: A supplementary contamination assessment needed to be undertaken within the former UST area. Six boreholes needed to be advanced withinAEC04 with two extending to groundwater. Soil up to 4 mbgl and groundwater would be assessed to determine whether any residual contamination presides within the area were present.

f) AEC05: 6,500 m^2 remained covered by asphalt carparking and the childcare centre that required assessment prior to the commencement of remediation in these areas. Seventeen test pits would be used.

g) Pending the results of the supplementary assessment, further remediation areas may be identified and remediated under an unexpected finds protocol or may be outlined within an additional addendum letter.

h) **Phase 3 Hold Point**: Phase 4 work in the Northern Conservation Area surrounding the child care centre was not to commence until:

- The environmental consultant had issued a Demolition and Contamination Assessment report prepared in accordance with EPA guidance documenting the demolition work and investigation of soil contamination under the building footprint of the former childcare

[82] Sections 10.6 & 12, Ref [12]

centre. In the event that contamination was found to exceed the remediation criteria, the report would need to detail any remedial measures required; and

- The Site Auditor had reviewed and issued a written approval of the Demolition and Contamination Assessment report and issued a written approval for Phase 4 work to proceed.

The sampling locations proposed by the 2025 RAP are shown in **Figure 4-6**.

The Site Auditor considered the scope of the Phase 3 work was acceptable and would provide additional data on site conditions.

4.5.5 Phase 4: Remediation of Asbestos & Heavy Metal Contamination

The 2025 RAP[83] advised that following the Phase 3 supplementary contamination assessments, the remediation areas for known asbestos contamination identified within AEC01, AEC02, AEC03 and AEC05 would need to be marked out by the Environmental Consultant in conjunction with the Remediation Contractor.

The Site Auditor considered that the setting out protocols needed to be specified in a work plan prepared by the Environmental Consultant that was reviewed and approved by the Site Auditor in Phase 1.

Phase 4.1 Stockpile bonded asbestos impacted fill

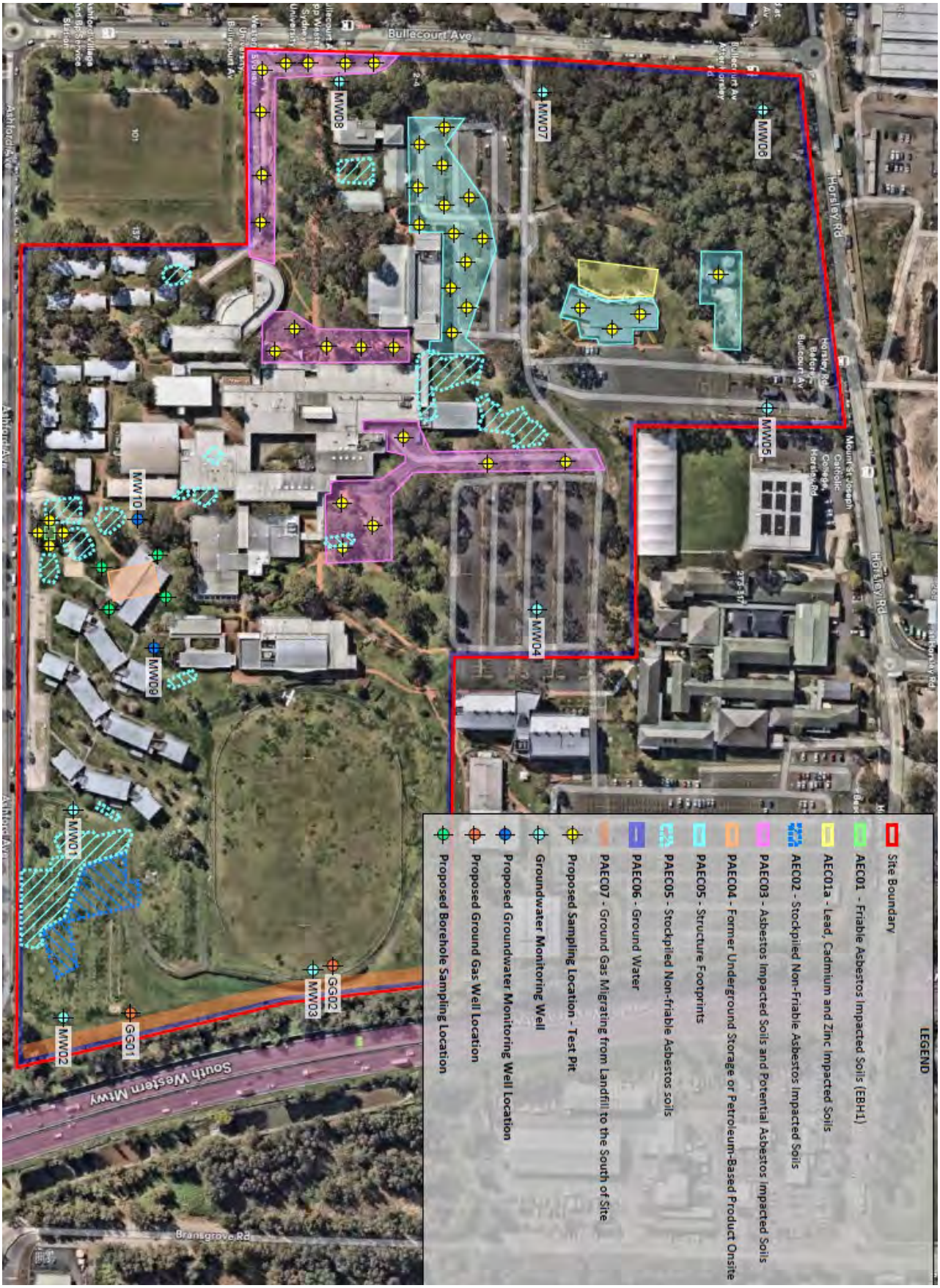
Shallow soils across large areas of the Site were stripped and stockpiled during the demolition work period, as previously described in **Section 2.13.12**. The shallow soils would have been impacted by asbestos. A breakdown of the stockpiled asbestos impacted soils is provided in **Table 2-20**.

The 2025 RAP[84] advised that:

- Bonded asbestos impacted soils encountered within AEC05 during the 2024 – 2025 demolition work were stripped from the AEC05 area and stockpiled on and covered by geofabric. The work generated 7,626 m^3 of bonded asbestos impacted spoil which is stockpiled throughout the north and south of Site. As these materials were excavated and stockpiled prior to the completion of supplementary assessment works within AEC05 they cannot be considered characterised, as such sampling will be required to confirm their suitability for treatment and re-use on-site;
- Soils at AEC02 were excavated during construction of a sediment basin in the south of Site and generated 4,156 m^3 of bonded asbestos impacted spoil that was stockpiled on site on a geofabric layer;
- Stockpiled soil would be relocated to a designated treatment area for remediation ex-situ prior to re-use onsite at depth;
- Soils would be treated in batches of 10 to 30 m^3, spread out to a thickness of approximately 100 mm on a designated ‘treatment pad’;

[83] Section 10.7, Ref [12]
[84] Section 10.7.1, Ref [12]

Figure 4-6 Supplementary Sample Locations by 2025 RAP (Source: Fig 7, Ref [12])



- The soil materials will then be raked, and any fragments of presumed asbestos picked by a suitably appropriate asbestos removalist. The licensed asbestos removalist will traverse the raked material in a systematic grid-based pattern removing fragments of bonded ACM by hand. At least two passes of raking and picking will be undertaken, with a 90^{o} direction change between each pass;
- The raked materials will be subject to a visual inspection by the supervising environmental consultant only once all visible fibre cement fragments had been removed will soils be re-stockpiled for the purpose of validation sampling;
- Following treatment and removal of all visible asbestos fibre cement fragments, the soil materials will then be stockpiled in 30 m^3 volumes and re-assessed against the remediation criteria. A visual inspection of the stockpiles and validation samples submitted for quantitative asbestos analysis would need to be collected from the treated soil material stockpiles (one sample per 10 - 30 m^3 stockpile). If the materials met the remediation criteria, the soil materials would be retained onsite. The soil materials would be buried beneath proposed roadways or within open space parkland areas planned for the Site;
- Until the receipt of validation results confirming suitability for re-use within the site, stockpiled treated materials would not be mixed or consolidated;
- In the event that soil materials exceeded the remediation criteria, a waste classification based on NSW EPA Waste Classification Guidelines 2014 would need to be prepared for disposal offsite to a licensed waste receiving facility;
- Following removal/treatment of impacted materials, validation sampling would be undertaken; and
- Movement of stockpiled soils needed to be tracked from cradle-to-grave.

As previously mentioned in **Section 2.13.12**, the Site Auditor considered the data provided by the EGA 2025 DSI on the scraping and stockpiling of asbestos contaminated soil did not meet the documentation completeness DQO because of the following data gaps:

- Details on the locations where soils were scraped, how the soils were scraped, transported and stockpiled;
- Precautions taken to avoid dilution mixing and cross-contamination;
- The environmental control measures taken;
- Asbestos fibre and dust air monitoring conducted during the work;
- Survey data verifying stockpile sizes;
- There was a risk that friable asbestos may have been stockpiled since no sampling and testing work was undertaken; and
- There was a risk that some of the stockpiled soil would be geotechnically unsuitable since the material scraped were surface soils that would have contained B&D waste, topsoil and vegetative matter.

The Site Auditor also considered that was a risk that the extensive scraping undertaken at the Site may have caused a much greater volume of asbestos contaminated soil to have been generated while reducing the concentration of some of the asbestos contamination through mixing with

uncontaminated soil. The Site Auditor noted that the WA DOH (2022) asbestos guidelines[85] state that "*Impacted soil should not be mixed with other soil in a way that might compromise the concentration calculations (i.e. dilution is not permitted)*."

The Site Auditor considered that the excavation and stockpiling of large volumes of asbestos and potentially geotechnically unsuitable soil at the Site may have increased the volume of asbestos contaminated soil needing to be remediated and the cost to undertake the remediation work.

To address these concerns, the Site Auditor recommended that all soil that had been stockpiled at the Site up to the date this SAS/SAR needed to be considered as asbestos contaminated and needing to be remediated by options acceptable to Mirvac, these being:

- On-site treatment to remove all visible asbestos; or
- Off-site disposal to a suitably licensed landfill.

Other matters that concerned the Site Auditor regarding the Phase 4.1 remediation work were:

- A significant amount of the stockpiled soil may be geotechnically unsuitable for use as engineered fill, which is of particular concern if treated fill is to be used as engineered fill in roadways;
- The location of the designated treatment area was not specified in the 2025 RAP. The Site Auditor considered there were some parts of the Site where the designated treatment area should not be located due to proximity to off-site receptors such as students and teachers at the Mount Saint Joseph's High School and residents along Ashford Avenue; and
- More detailed information was required on the proposed treatment process in order that it met recommendations given in EPA guidance.

The Site Auditor addressed these concerns by placing the following conditions on the Section B SAS:

> *"There is a risk that a significant portion of the 11,782 m³ of stockpiled soil at the Site may be geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos had been removed or the geotechnically unsuitable soil needed to be disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils need to be undertaken and then a work plan prepared that documents a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The work plan then needs to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site."*
>
> *"A set of geotechnical criteria need to be developed that would define those soils that could be reused on-site after asbestos had been removed, soils that could be reused after asbestos and unsuitable materials had been removed, and those soils that would need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria need to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site."*
>
> *"No remediation work is to commence at the Site until the Site Auditor has received, reviewed and provided written approval all work plans prepared for the remediation work."*

[85] Section 5.7.3, WA DOH (2022) Asbestos Guidelines

"All soil stockpiled at the Site up to the date of this SAS needs to be considered as asbestos contaminated and needs to be remediated by either on-site treatment to remove all visible asbestos, or off-site disposal as asbestos waste to a suitably licensed landfill. No stockpiled soil is to be reused at the Site unless it has been treated and validated as containing no visible or friable asbestos."

"The former southern sports field located adjacent to the Mount Saint Joseph's High School and land within 50m of the western boundary along Ashford Avenue are not to be used as an area where asbestos contaminated soil is treated or where mechanical screening is undertaken due to the risks posed by asbestos fibre and dust generation."

Phase 4.2 Friable asbestos impacted fill

The 2025 RAP[86] advised that:

- Friable asbestos was previously identified within two sampling locations within AEC02 identified as 'EBH24' and 'EBH25'. The soils associated with these locations were excavated and disposed off-site prior to validation sampling and no require no further remediation work;
- Friable asbestos was previously identified within six sampling locations within AEC01 identified as EBH1, EBH2, EBH3, EBH5, SS10 and BH39. Five of these locations (not EBH1) were excavated and disposed off-site prior to validation sampling and require no further remediation work;
- The lateral extent of friable asbestos contamination at EBH1 needed to be delineated by sampling, excavated and disposed off-site to a licensed waste receiving facility. A SafeWork NSW Licensed Asbestos Assessor would then need to inspect the remaining soil surfaces no later than 5 days following the completion of work and provide a visual clearance certificate of the excavation footprint. The soils within the surrounding area (10 m) of EBH1 were to remain undisturbed until the results of the validation sampling had returned and a clearance report prepared. If asbestos was observed or detected within the samples, additional remediation and validation work would be required;
- Should spoil generated during remediation of EBH1 need to be temporarily stockpiled within the Site prior to load out, specified controls needed to be implemented; and
- All excavated soil needed to be tracked from cradle-to-grave.

The Site Auditor had concerns regarding the remediation approach specified in the 2025 RAP for known friable asbestos contamination at AEC01 and AEC02. These were:

- The 2025 RAP advised that the remediation and validation work undertaken at the five locations in AEC01 had been documented in an asbestos materials clearance inspection report dated 20/12/24. However, a copy of this report was not included in the 2025 RAP or any other document provided to the Site Auditor prior to the completion of this SAR (**Section 3.6.1**);
- The 2025 RAP advised that the remaining friable asbestos hot-spot at AEC01 was not remediated in December 2024 because it was located in a tree protection zone, which prevented disturbance of underlying soil. These materials presented a friable asbestos risk that required further assessment and remediation. The 2025 RAP advised that no works

[86] Section 10.7.2, Ref [12]

would be undertaken within tree protection zones as part of the Category 2 remedial scope (**Section 3.6.1**); and

- The 2025 RAP advised that the remediation and validation work undertaken at the two locations in AEC02 had been documented in an asbestos materials clearance inspection report dated 14/10/24. However, a copy of this report was not included in the 2025 RAP or any other document provided to the Site Auditor prior to the completion of this SAR (**Section 3.6.2**).

The Site Auditor addressed these deficiencies in the 2025 RAP by placing the following conditions on the Section B SAS:

> *"A copy of the EGA (14/10/24 & 20/12/24) reports on early remediation work at friable asbestos hot-spots at AEC01 and AEC02 needs to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work can be assessed prior to the commencement of remediation work at the Site."*
>
> *"The project environmental consultant needs to prepare a work plan for the remediation of asbestos contamination within tree protection zones so that the plan can be reviewed and approved by the Site Auditor, the necessary regulatory approvals obtained for the work, and remediation work completed prior to the commencement of bulk earthworks at development stages where tree protection zones are located."*

The Site Auditor also considered that it was likely that friable asbestos contaminated fill was present at other presently unknown locations for the reasons given in **Section 4.2**. Such contamination when found would also need to be remediated. The Site Auditor considered that the presence of additional friable contamination could be identified by ensuring that 500 mL size validation soil samples continued to be collected and lab tested to determine whether friable asbestos was present and its concentration.

Phase 4.3 Bonded asbestos impacted fill

The 2025 RAP[87] advised that in-situ fill materials would be excavated down to the depth of the previously identified asbestos impacts, or beyond the extent of visible ACM if encountered passed this point. The spoil would then be loaded directly into trucks and relocated to a designated treated area for remediation ex-situ prior to re-use on-site at depth and treated using the procedures described for Phase 1 work above.

The Site Auditor considered the remediation approach described in the 2025 RAP for the Phase 4.3 work was generally acceptable provided

- Excavation depths were based on the base of the fill layer where asbestos had been identified by investigations rather than on the depth of the sample that was lab tested;
- An excavation plan for an area to be remediated was prepared by the Environmental Consultant and approved by the Site Auditor prior to the commencement of excavation work in the area; and

[87] Section 10.7.3, Ref [12]

- Issues regarding the location of the designated treatment area and a more detailed set of work procedures were addressed as described in review comments for Phase 1 work above and comments placed on the Section B SAS.

Phase 4.4 Other types of contamination and Unexpected Finds

The 2025 RAP[88] advised that:

- Should results from the supplementary contamination assessment indicate the need for further assessment or remediation, the environmental consultant would decide if treatment under the unexpected finds protocol was sufficient or if there was a need to develop an addendum letter to report on site specific methodologies to remediate the newly identified AEC. The decision would be based on the extent of impact, access constraints, and any other observations.
- During Phase 3 or Phase 4 works other types of contamination that were known or suspected of being present may be encountered such as:
  - Contaminated soil across former hardstand areas or building footprints;
  - Redundant septic tanks associated with past rural use of the Site that may contain pathogens, asbestos, chemical residues, other hazardous building materials and waste;
  - Asbestos fibre cement conduits associated with redundant services; and
  - USTs that were not removed in the western part of the Site together with associated petroleum hydrocarbon contamination.
- Should a vapour intrusion risk associated with the former USTs be identified an addendum to the RAP would be required detailing an assessment of the risks in addition a discussion on the most suitable management strategies.
- Soils impacted by friable asbestos above the remediation criteria or identified to present a human health risk needed to be excavated, subject to waste classification and disposed off-site to a licensed waste receiving facility.
- Soils identified to be ecologically unsuitable needed to be excavated and re-used on-site beneath roadways or within residential lots at depths greater than 2m.
- Redundant asbestos fibre cement conduits needed to be carefully exposed using a hydraulic excavator and removed in 2 m sections by hand, separating section at the joints. The sections needed to be wrapped in two layers of polyethylene sheeting (200 µm thick) prior to disposal off-site as asbestos waste. If the soils surrounding the conduit removal area were observed to be impacted with debris by the supervising environmental consultant, the impacted materials should be remediated.
- Redundant septic tanks if encountered would be removed and remediated as per procedures given by the 2025 RAP.
- The movement of all materials within Site needed to be tracked from cradle to grave in accordance with the materials tracking plan.

[88] Section 10.7.4, Ref [12]

- Site work may find contamination and buried materials not anticipated and addressed by the CSM were to be referred to as Unexpected Finds and remediated in accordance with protocols given in the 2025 RAP.

The Site Auditor considered the protocols given in the 2025 RAP for remediating other types of contamination and Unexpected Finds were appropriate and met EPA guidance provided it was recognised that the most likely time that new or unexpected contamination finds would be made was during excavation work being conducted for remediation or bulk earthworks. Such contamination finds needed to be identified, assessed and remediated through a program that involved:

- Close supervision of the work by the contractors and the project environmental consultant;
- Specifying appropriate work procedures in work plans and the CEMP;
- Induction and training of site personnel to identify physical evidence of contamination; and
- Protocols for assessing and remediating new and unexpected finds.

Phase 4.5 Decommissioning asbestos treatment area

The 2025 RAP[89] advised that the asbestos treatment area would be decommissioned and remediated following the completion of asbestos soil treatment work and the placement of temporarily stockpiled treated soils. Remediation of the area would involve:

- Scrapping the entire treatment area footprint to a depth of 100 mm;
- Spoil generated from the scrape would be placed in 30 m^3 stockpiles within the treatment area footprint and re-assessed against the remediation criteria;
- Validation samples submitted for quantitative asbestos analysis would be collected from the soil stockpiles. If the soils met the remediation criteria, the soil would be re-used on site at depth buried beneath proposed roadways or within open spaces planned for the site;
- Stockpile footprints would be over excavated 100 mm into the underlying soils during relocation to ensure no residual soil remained within the treatment area; and
- The soil surface of the treatment area would be subject to a systematic grid based inspection and validation sampling.

The Site Auditor considered the protocols given in the 2025 RAP for decommissioning the asbestos treatment area were appropriate and met EPA guidance provided:

- The Site Auditor inspected the decommissioned asbestos treatment area at the time validation sampling was being undertaken by the project environmental consultant; and
- The decommissioning work was documented in detail in the validation work.

[89] Section 10.7.5, Ref [12]

Phase 4.6 Remediation contingencies

The 2025 RAP[90] advised that should validation samples / observations indicate further contamination was present at the Site that exceeded remediation criteria, additional remediation would be required. The extent of the contamination would be determined by the environmental consultant and the contamination remediated and validated. Protocols for temporarily stockpiling contaminated soils were provided by the 2025 RAP.

The Site Auditor considered that a more detailed contingency plan needed to be developed prior to the commencement of site work because of the significant uncertainties that remained with the amount of remediation work that may be required at the Site. These uncertainties included:

- The presence of bonded asbestos in 11,782 m^3 of soil that had already been stockpiled at the Site;
- The potential for a significant proportion of the stockpiled soil to be geotechnically unsuitable in its present condition;
- Uncertainties with the volume of unexcavated fill that may be asbestos contaminated and need to be remediated;
- Additional contamination found by the supplementary investigation that needed to be undertaken in Phase 3; and
- Site constraints posed by the Development Staging and bulk earthwork requirements.

The Site Auditor addressed this need by requiring a detailed contingency plan to developed by the Mirvac Project Team as part of Phase 1 work that needed to be completed and a copy provided to the Site Auditor prior to the commencement of site work.

Phase 4.7 Hold Point

The 2025 RAP[91] advised that no Phase 5 work was allowed to occur in the particular Development Stage until:

- All asbestos impacted fill in the particular Development Stage had been removed and the remaining soils validated as meeting the remediation criteria. This work needed to be documented by the Environmental Consultant in an interim report;
- The Site Auditor had reviewed and approved the Phase 4 interim report; and
- All Phase 4 work in the particular Development Stage had been completed and the Site Auditor had issued a written approval for Phase 5 work to proceed in the particular Development Stage where contaminated soil had been removed.

The Site Auditor considered the Phase 4.7 hold points were appropriate given the large volume of asbestos contaminated soil that was on-site needing to be remediated.

[90] Section 10.7.6, Ref [12]
[91] Section 10.7.7, Ref [12]

4.6 Phase 5: Management of Contamination Risks during Bulk Earthworks

The 2025 RAP[92] advised that there was a high likelihood that isolated asbestos fragments would be found in fill not located in designated remediation areas. To manage the safe removal of these fragments, the 2025 RAP provided procedures that needed to be followed.

Phase 5.1 Excavate remaining soils to final excavation level

The 2025 RAP[93] required:

- All site workers are to attend regular toolbox meeting where the likelihood of isolated fragments of bonded asbestos being found in fill outside designated remediation areas was discussed along with the procedures that needed to be taken by workers to deal with such fragments;
- In the event asbestos impacted fill materials were encountered, works had to stop and the unexpected finds protocol implemented;
- Full time supervision of bulk earthworks would be required by an environmental consultant in order to maintain detailed records on the following:
  - Condition of the soils encountered during bulk earthworks;
  - Excavation procedures used during works;
  - Types of machinery used to transport soils within site;
  - Condition of stockpiled soils;
  - Condition of geofabric layers and their fixtures;
  - Document environmental procedures, their maintenance and efficacy;
  - Copies of field records and photos for works completed;
  - Documentation of the materials tracking procedures employed by the civil contractor;
  - Documentation of the variation and thickness of fill types throughout the site;
  - Monitor transport of materials by a contractor licensed to transport the waste; and
  - Monitor transit routes and assessment of cross contamination risks.

The Site Auditor considered these protocols were appropriate and needed to be implemented together with the following:

- Inspect stockpiles where visible asbestos was found and either remove the asbestos fragments if few in number or direct that the soil stockpile be remediated;
- Inspect excavated surfaces and remove any visible asbestos found;
- Identify any parts of an excavation area where asbestos impacted fill needed to be remediated; and

[92] Section 10.8, Ref [12]
[93] Section 10.8.1, Ref [12]

- Document the work done and findings made on a daily field record that was supported by photos, with copies of all field records to be included in the validation report prepared for the particular Development Stage.

The 2025 RAP[94] also advised that the placement / re-use of treated soils at depth was not to occur in the particular Development Stage until:

- All Phase 5.1 work had been completed in the particular Development Stage;
- The Environmental Consultant had prepared an interim report on the Phase 4 works and concluded that no contamination remained in the particular Development Stage exceeding the Remediation Criteria; and
- The Site Auditor had inspected all final excavation surfaces in a particular Development Stage and issued a written approval for placement / re-use work to proceed in the particular Development Stage.

The Site Auditor considered the above Phase 5.1 hold points were appropriate given the large volume of asbestos contaminated soil that was on-site needing to be remediated.

Phase 5.2 Placement / reuse of treated soils at depth

The 2025 RAP[95] advised that treated soils needed to be re-used at depth within the Site due to the potential for ACM to still remain in treated soil despite meeting the Remediation Criteria. This would ensure that these soils would not be disturbed and potentially left exposed as part of reasonable future land use scenarios. Other protocols adopted for backfilling treated soils were:

- Treated soils would not be re-used within residential lots;
- Treated soils would not be placed within the proposed alignment of services deeper than 2.5mbgl;
- Re-use of treated materials within proposed road corridors would be limited to depths 0.5 m below the deepest expected service;
- Re-use of treated materials within open space parkland portions of the Site would be limited to depths 0.5 m below the deepest expected service or 1.0 mbgl, whichever was greater;
- No deep footings were proposed as part of the designs within open space parkland areas;
- Landscaping or tree removal activities within future parkland areas were unlikely to disturb soils deeper than 1 mbgl;
- Disturbance to soils within the proposed roadway corridors were likely to be limited to maintenance of services; and
- No further excavation or bulk earthworks are to occur following the completion of placement works within a given development stage.

The Site Auditor considered the above Phase 5.2 protocols for the placement / reuse of soils at depth were reasonable together with the following:

[94] Section 10.8.1, Ref [12]
[95] Section 10.8.2, Ref [12]

- No vehicles containing contaminated soil were to be excluded from Development Stages that had been remediated;
- Signage and barricades needed to be erected at access points to remediated Development Stages to prevent the inadvertent access for remediation activities being undertaken in other parts of the Site;
- The geotechnical technician responsible for conducting in-situ soil density tests should be required to:
  - Notify the Site Manager of any evidence of visible asbestos or other suspected contamination found during soil density testing so that it can be checked out by the Environmental Consultant; and
  - Require Compaction Test Certificates to advise whether or not any evidence of visible asbestos or other suspected contamination was found during soil density testing.

Phase 5.3 Import VENM or ENM soil to fill areas

The 2025 RAP[96] advised that:

- Only VENM and ENM soils were to be imported to Site and used as engineered fill;
- VENM / ENM certification needed to comply with EPA requirements;
- All waste classification reports for imported fill needed to be formally reviewed by the environmental consultant prior to importation to the site;
- The remediation contractor needed to maintain detailed records of all fill imported to the Site, including details of the supplier, the source of the fill, the quantities of the fill, vehicle registration numbers and the dates/times the fill was received on site;
- The remediation contractor needed to inspect every load of material imported to Site, to check that the material was consistent with the material described in the VENM / ENM certification and that each load was free of visual anthropogenic materials, staining or odours;
- The remediation contractor needed to maintain a documented record of each inspection;
- The Protocol for importing VENM / ENM was:
  - VENM / ENM soil needed to be tested, validated and documented in accordance with EPA guidance, with copies of the documentation included in validation reports;
  - Only VENM / ENM soil approved in writing by the environmental consultant was to be imported to the Site;
  - All VENM / ENM imported to the Site needed to be tracked from source to Site;
  - The Contractor needed to ensure that only approved trucks were used to import VENM / ENM soil to the Site;
  - All VENM / ENM soil needed to be inspected upon delivery to the Site by the Contractor. Any materials suspected of being contaminated or inconsistent with EPA standards for VENM / ENM requirements needed to be rejected by the Contractor and removed from the Site; and

[96] Section 10.8.3, Ref [12]

- The Environmental Consultant needed to validate VENM / ENM soil imported to the Site.

The Site Auditor considered the above Phase 5.3 protocols for imported VENM / ENM were appropriate and met EPA guidance.

Phase 5.4 Final surface soil inspection

The 2025 RAP[97] advised that following the completion of bulk earthworks, the soil surface of the final finish level needed to be visually inspected by a competent person and an asbestos materials clearance inspection report prepared for inclusion in the validation reporting for that Development Stage. The visual clearance of residual soil surfaces needed to involve a grid-based walkover with a 2 m wide lane across the designated area supported by photos showing surface soil conditions.

The Site Auditor considered the above Phase 5.4 protocols for final surface soil inspection were appropriate and met EPA guidance.

4.7 Waste and Site Validation Sampling

Classification of Waste to be Disposed Off-site

The 2025 RAP[98] advised that:

- Waste would be sampled and classified in accordance with EPA (2014) waste guidelines;
- Waste documentation requirements were specified;
- The remediation contractor needed to maintain detailed records of materials removed from the Site, including date/time of removal, quantities of materials, transport company details and vehicle registration details;
- The remediation contractor needed to retain records verifying lawful disposal of the materials, including date / time the waste left site, approximate volume per load, the classified of the waste contained in each individual load, transport vehicle registration details, weighbridge / tipping dockets with receipt dates / times and tipped waste classification from the waste receiving facility;
- Material placed onsite (stockpiles or moved to other location) must be tracked so that the source of material can be identified should unexpected finds be encountered.

The Site Auditor considered the above waste classification methodology was appropriate and met EPA guidance provided samples were collected and tested at a frequency that met the requirements of the EPA (2022) Sampling Guidelines.

[97] Section 10.8.4, Ref [12]
[98] Section 11.8.1, Ref [12]

Former Building Footprints and Hardstand Areas

The 2025 RAP[99] advised that following the demolition of structures or hardstand areas, surface soils would be inspected by a suitably qualified and experienced environmental consultant for physical indicators of contamination such as foreign materials, potential ACM, staining or odours. The inspection would consist of a systematic grid-based walkover with 2 m lane spacing, with the area to be photographed.

The 2025 RAP did not provide protocols for collecting and testing validation samples. The Site Auditor addressed this data gap by requiring surface soil samples to be collected at a frequency that met EPA (2022) Sampling Guidelines and lab tested for the COPCs relevant to the AEC. Samples to be tested for asbestos concentrations needed to be a minimum 500 mL in size as per the NEPM guidance.

Existing Soil Stockpiles

The 2025 RAP provided no protocols for sampling the existing stockpiled soil. The Site Auditor considered this was appropriate since all existing stockpiled soil should be regarded as contaminated by asbestos and needing to be treated in the Designated Asbestos Treatment Area. The treated soil would then be subject to validation testing.

Existing Soil Stockpile Footprints & Transit Route

The 2025 RAP[100] advised that following relocation of existing stockpiled soils to the designated asbestos treatment area surface soils within the former stockpile footprint needed to be removed to a depth of 100 mm. The remaining surface soils then needed to be inspected by a suitably qualified and experienced environmental consultant for physical indicators of contamination such as foreign materials, potential ACM, staining or odours. The inspection would consist of a systematic grid-based walkover with 2 m lane spacing, with the area to be photographed. The transit route used to relocate the stockpiled soil would also need to be inspected for suspected ACM.

The Site Auditor considered these validation protocols were reasonable given that the existing stockpiles are located on ground that is contaminated and would need to be excavated and remediated.

Excavations in Asbestos Remediated Areas

The 2025 RAP[101] advised that following the excavation and removal of asbestos contaminated soil from an area, the following methodology needed to be used to validate the remaining soils:

- The excavation area and immediate surroundings needed to be inspected for suspected ACM involving a systematic grid-based walkover with 2 m lane spacing supported by photos;
- The transit route needed to be inspected for suspected ACM involving a systematic grid-based walkover with 2 m lane spacing supported by photos;

[99] Section 11.8.2, Ref [12]
[100] Section 11.8.3, Ref [12]
[101] Section 11.8.4, Ref [12]

- Surface soil validation samples would be collected from the floor at 25 m^2 spacing and from walls at 10 m spacing. All samples needed to be 500 mL in size and tested for asbestos concentrations.

The Site Auditor considered these validation protocols were appropriate for small areas (≤0.1 ha), but the sampling frequency was unnecessarily excessive for larger areas, where validation samples should be collected at wider frequencies that met EPA (2022) Sampling Guidelines.

Treated Asbestos Impacted Soil

The 2025 RAP[102] advised that treated soils where no visible asbestos remained needed to be placed in 30 m^3 stockpiles for the purpose of validation. The treated soil then needed to be inspected by the supervising environmental consultant. One 10L soil sample per 30 m^3 of treated material needed to be collected and screened for fragments of ACM >7mm together with the collection of a 500 mL sample The samples would then be submitted to a NATA accredited lab for quantitative asbestos analysis.

Stockpiled treated soils were not to be mixed or consolidated until the receipt of validation results confirming suitability of the soil for re-use within the Site. In the event that the lab tests on treated soil samples exceeded the remediation criteria, a waste classification assessment and report would need to be prepared so that the failed soil could be disposed off-site.

The Site Auditor considered these validation protocols were appropriate provided that stockpiles of treated soil were not moved for reuse until the lab validation results had been obtained showing that the treated soil met the remediation criteria.

Buried Asbestos Conduits

The 2025 RAP[103] advised that following the removal of redundant asbestos fibre cement conduits, the residual soil surfaces in the trenches needed to be validated by a systematic inspection by a competent person. The inspection would involve a systematic grid-based walkover with a 2 m lane spacing over the subject area and immediate surroundings for suspected ACM. Photos of the trench also needed to be taken. The inspection would also involve the transit route used by trucks and equipment involved in the removal of the pipe.

The Site Auditor considered these validation protocols were appropriate provided that any visible ACM in the trench is removed and a 500 mL soil sample collected from the cleared location to check that all asbestos was removed.

Excavations for Pits and USTs

The 2025 RAP[104] advised that:

- If redundant septic tanks were encountered, they would need to be exposed by careful excavation and examined for potential leaks and general condition. Following the tank removal, 250 mL validation samples would need to be collected from the residual exposed soils at a minimum frequency of one sample per 5 m of excavation wall (minimum of one

[102] Section 11.8.5, Ref [12]
[103] Section 11.8.6, Ref [12]
[104] Section 11.8.7, Ref [12]

sample per wall), and one sample per 25 m^2 of excavation floor. Each sample then needed to be tested at a NATA-accredited lab for metals, PAH, BTEX, TRH, asbestos, OCPs, E.Coli and Thermotolerant Coliforms. A photographic record of the excavation footprint must be maintained.

- If USTs were encountered, they would need to be exposed by careful excavation and examined for potential leaks and general condition. Following excavation surrounding the UST to expose the tank structure, visual inspection for leaks and assessment of the tank integrity. Following removal of the tank, inspection of excavation footprint for leaks, staining or odours followed by the collection of 250 mL validation samples at a minimum frequency of one sample per 5 m of excavation wall (minimum of one sample per wall), one sample per 25 m^2 of excavation floor, and one sample per 5m along fuel lines. Each sample then needed to be tested at a NATA-accredited lab for metals, PAH, BTEX, TRH, VOC/SVOC, phenols. A photographic record of the excavation footprint must be maintained.
- If visual or analytical evidence of leaks was observed in the tank and / or tank pit then further groundwater monitoring may be required as advised by the Environmental Consultant.

The Site Auditor considered these validation protocols were appropriate and met EPA guidance.

4.8 Reporting

The 2025 RAP[105] documented the reporting requirements that needed to be met by the remediation project. The types of reports required were interim reports, site inspection reports, interim completion report, interim and final validation reports.

The Site Auditor considered these reporting protocols were appropriate given the large scale of the project, with them also meeting EPA guidance.

4.9 Site Management Plan

The 2025 RAP[106] documented a site management plan that covered:

- Soil and stormwater management;
- Asbestos management;
- Regulatory notification;
- Airborne asbestos monitoring;
- Clearance inspection and certificates;
- Groundwater management;
- Noise control;
- Dust control;
- Odour control;
- Traffic management;

[105] Section 12, Ref [12]
[106] Section 13, Ref [12]

- Vibration management;
- Worker health and safety;
- Site signage;
- Site security;
- Site hours of operation;
- Community relations and complaints;
- Emergency preparedness;
- Register of contacts.

The Site Auditor considered the site management plan was generally appropriate provided the following additional measures were taken:

- Airborne asbestos monitoring locations needed to include, but not be limited to, the high school on the eastern boundary and Ashford Avenue on the western boundary adjacent to residential homes. Monitoring locations also needed to be biased to locations where the highest risk of airborne asbestos was present;
- Noise levels need to be limited to the extent practicable given the nearby sensitive receptors at the high school and off-site residents; and
- A watercart must be present on-site through the remediation and bulk earthworks. Activities should be designed to minimise dust generation to the extent practicable. No visible dust should pass across site boundaries;

5. Conclusions

This Site Audit Report contains the results of a Statutory Site Audit for the Western Sydney University – Milperra Campus, which covers 19.64 ha of land in Milperra, Sydney. The Site is legally defined by Lot 1 in DP101147 and Lot 2 in DP1291984 and is located in the City of Canterbury-Bankstown LGA.

The audit was conducted for the purpose of determining whether:

- The nature and extent of the contamination has been appropriately determined;
- The investigation, remediation or management plan is appropriate for its stated purpose;
- The Site can be made suitable for low-density residential land use (i.e. Residential A) as approved by a Development Consent;
- To support the Department of Planning, Housing and Infrastructure (**DPHI**) and Council's decision making propose concerning the granting of a Development Consent for the proposed development; and
- To issue a Section B SAS certifying the appropriateness of a RAP for remediating contamination and validating the final condition of the Site.

The Site Auditor considers the weight of evidence supports the conclusions that:

- The nature and extent of the contamination was appropriately determined for the reasons given in **Section 2**.
- The review of the Demolition Clearance Report is documented in **Section 3**. The review concluded that the demolition work conducted at the Site between October 2024 and July 2025:
  - Met Condition 1.3 of the Demolition Development Consent, since only structures from approved zones were demolished;
  - Was close to meeting Condition 1.7 of the Demolition Development Consent. This is because clearance certificates for visible asbestos were issued for practically all buildings. The one exception for a clearance certificate was the removal of an electrical distribution box from Building 12. However, this one data gap was considered no to be significant given the small amount of work involved in removing this one box and the large number of clearance certificates that were issued;
  - Was likely to have met or closely met Condition 3.6 of the Demolition Development Consent based on the data provided in the report and observations made by the Site Auditor during site inspections conducted prior to, during and after the completion of the demolition work; and
  - Data gaps in waste disposal documentation meant that the Site Auditor was unable to conclude that the demolition work conducted at the Site met Conditions 2 and 3.13 of the Demolition Development Consent. Until these data gaps were addressed, the Site Auditor considered there was a risk that demolition waste generated after March 2025 was not properly managed, the friable contaminated soil at five locations at AEC01 either remained unexcavated or was excavated but placed in one or more of the soil stockpiles spread around the Site.

- The 2025 RAP documented an appropriate strategy for remediating contamination that can make the Site suitable for the purpose stated above for the reasons given in **Section 4**, provided the recommendations documented in this SAR are addressed.
- The Site can be made suitable for residential land use with a Residential A land use setting for the reasons given in **Section 4**.

The conclusions and recommendations made in this SAR are summarised in a Section B SAS, with a copy provided in **Appendix E** along with a copy of the 2025 RAP. The Section B SAS addresses the recommendations made in this SAR by placing the following conditions on the conclusions made:

1. The remediation and validation of the Site is to be the subject of a statutory site audit, culminating in the issuing of one or more Section A SAS/SAR audit documents following the completion of remediation and validation work meeting NSW EPA and Council guidance.
2. There are data gaps in the Demolition Clearance Report (Ref [10]) that need to be addressed concerning the removal and disposal of 112 tonnes of asbestos contaminated building and demolition (B&D) waste for the period 13/05/25 to 10/07/25, and the disposal of 54 tonnes and 113 tonnes of fibrous asbestos contaminated soil reportedly excavated and disposed off-site on 4/10/24 and 13/12/24, respectively (refer Section 3.7, SAR). These data gaps need to be addressed to the satisfaction of the Site Auditor prior to the commencement of remediation work at the Site.
3. Copies of the SEG (14/10/24 & 20/12/24) reports on early remediation work at fibrous asbestos hot-spots at AEC01 and AEC02 need to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work can be assessed prior to the commencement of remediation work at the Site.
4. There is a risk that a significant portion of the 11,782 m^3 of stockpiled soil at the Site may be geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos had been removed, or the geotechnically unsuitable soil needs to be disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils need to be undertaken and then a work plan prepared that documents a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The work plan needs to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site.
5. A set of geotechnical criteria need to be developed that will define those soils that can be reused on-site after asbestos has been removed, soils that can be reused after asbestos and unsuitable materials have been removed, and those soils that will need to be disposed off-site at a suitably licensed waste facility. The geotechnical criteria need to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site.
6. No remediation work is to commence at the Site until the Site Auditor has received, reviewed and provided written approval all work plans prepared for the remediation work.
7. The project environmental consultant needs to prepare remediation strategies for contamination within tree protection zones and the Northern Conservation Zone and provide them to the Site Auditor for review prior to the commencement of remediation work at the Site.

8. Remediation of contamination at the Site needs to be undertaken in accordance with the recommendations made by the Site Auditor in the site audit report accompanying this site audit statement.
9. All soil stockpiled at the Site up to the date of this SAS needs to be considered as asbestos contaminated and remediated by either on-site treatment to remove all visible asbestos, or off-site disposal as asbestos waste to a suitably licensed landfill. No stockpiled soil is to be reused at the Site unless it has been treated and validated as containing no visible or fibrous asbestos.
10. The former southern sports field located adjacent to the Mount Saint Joseph's High School and land within 50m of the western boundary along Ashford Avenue are not to be used as an area where asbestos contaminated soil is treated or where mechanical screening is undertaken due to the risks posed by asbestos fibres and dust generation to the local community.
11. Changes to the remediation strategy documented in the EGA (25 October 2025) RAP and the additional requirements specified by the Site Auditor in the site audit report are only to be made following written approval by the Site Auditor.

6. Other Relevant Information

This Site Audit Report and the accompanying Site Audit Statement relates to the 19.64 ha of land referred to as the Western Sydney University – Milperra Campus, Sydney. The report has been prepared in accordance with the CLM Act. Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

The audit report and statement have been prepared for Mirvac (the 'Client') for the purposes nominated in the audit report. It is acknowledged that the audit report and statement may be used by the City of Canterbury Bankstown and the EPA in reaching their conclusions about the Site. The scope of work performed in connection with the audit review may not be appropriate to satisfy the needs of any other person. Any other person's use of, or reliance on, the audit report and statement, or the findings, conclusions, recommendations or any other material presented in them, is at that person's sole risk.

The audit was, and this report is, limited by and relies on the scope of work undertaken for this audit, the information made available to the Site Auditor by the Client and their consultants through the documents provided to us, and also on our observations of the Site made during the audit period. The Site Auditor has taken this information to represent a fair and reasonable characterisation of the status of the land. Whilst all reasonable care has been taken, to the extent practical under normal auditing procedures, to assure adequacy of the information, the Site Auditor and Ian Swane & Associates (IS&A) cannot warrant that this is the case. If the information is subsequently determined to be false, inaccurate or incomplete, it is possible that the Site Auditor's conclusions, as expressed in the audit report and statement may change.

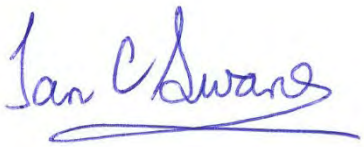
This Site Audit applies to the condition of the Site at the time the audit was undertaken. The Site Auditor and IS&A cannot be responsible for future activities that may result in changes to the site conditions. In the event that site conditions have since changed or are likely to change in the future, the Site Auditor recommends that the property owner engage an environmental consultant to confirm that the Site is being properly maintained to a condition suitable for Residential A land use.

It must also be recognised that sub-surface conditions, including groundwater levels and contaminant concentrations, can change in a limited time. This should be borne in mind if the audit report and statement is used after a protracted delay.

There are always some variations in sub-surface conditions across a site that cannot be fully defined by investigation. No investigation, in practice, can be thorough enough to preclude the presence of materials on the subject property that presently, or in the future, may be considered hazardous. Hence it is possible that the measurements and values obtained from the sampling and testing presented do not represent the extremes of conditions which exist within the Site.

Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable at the time of this audit report and statement, may in the future become subject to different regulatory standards and require reassessment. It is not possible in a Site Audit Report to present all data that could be of interest to all readers of this report. Readers are therefore referred to the referenced documentation for further data.

Yours faithfully

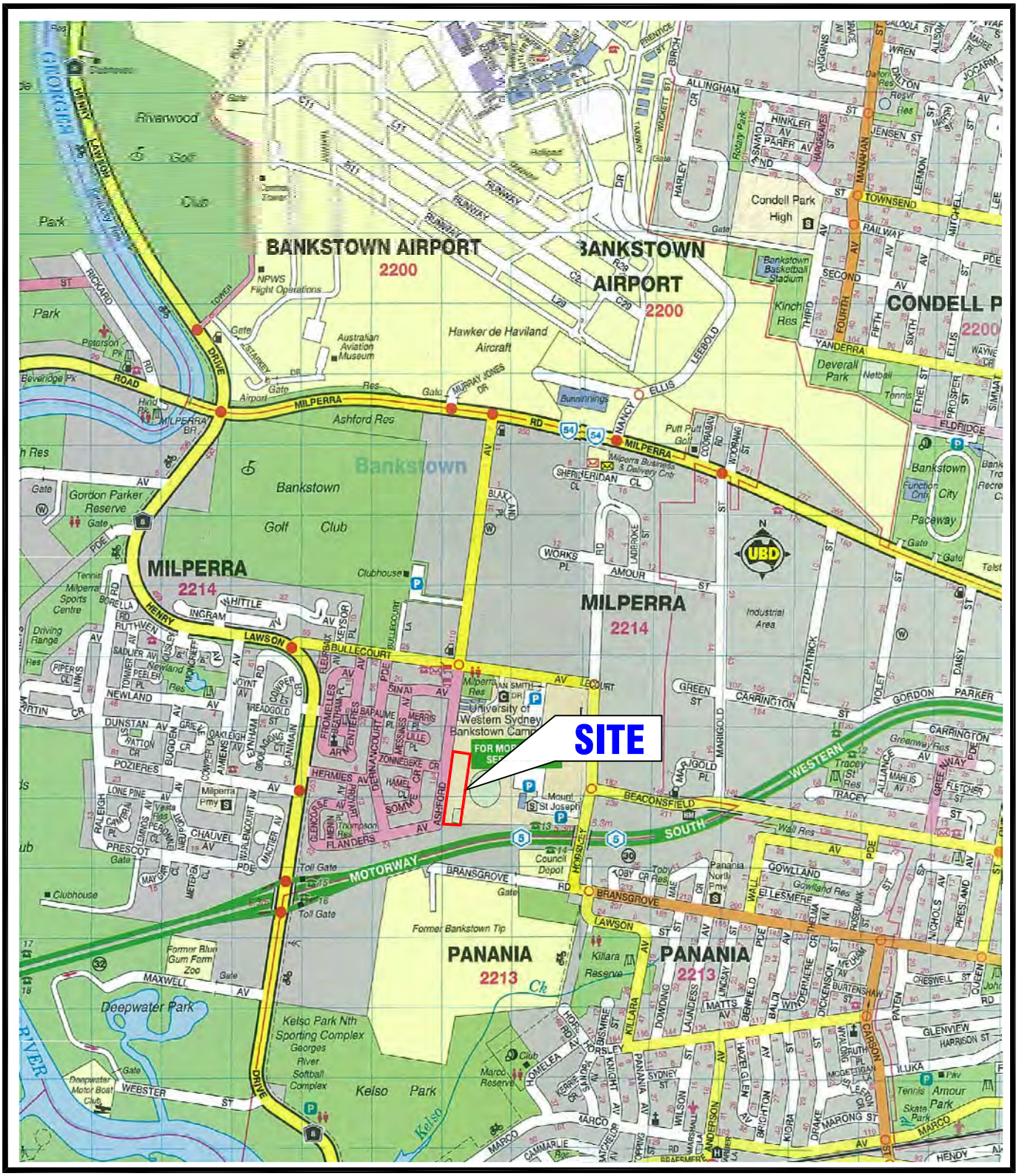


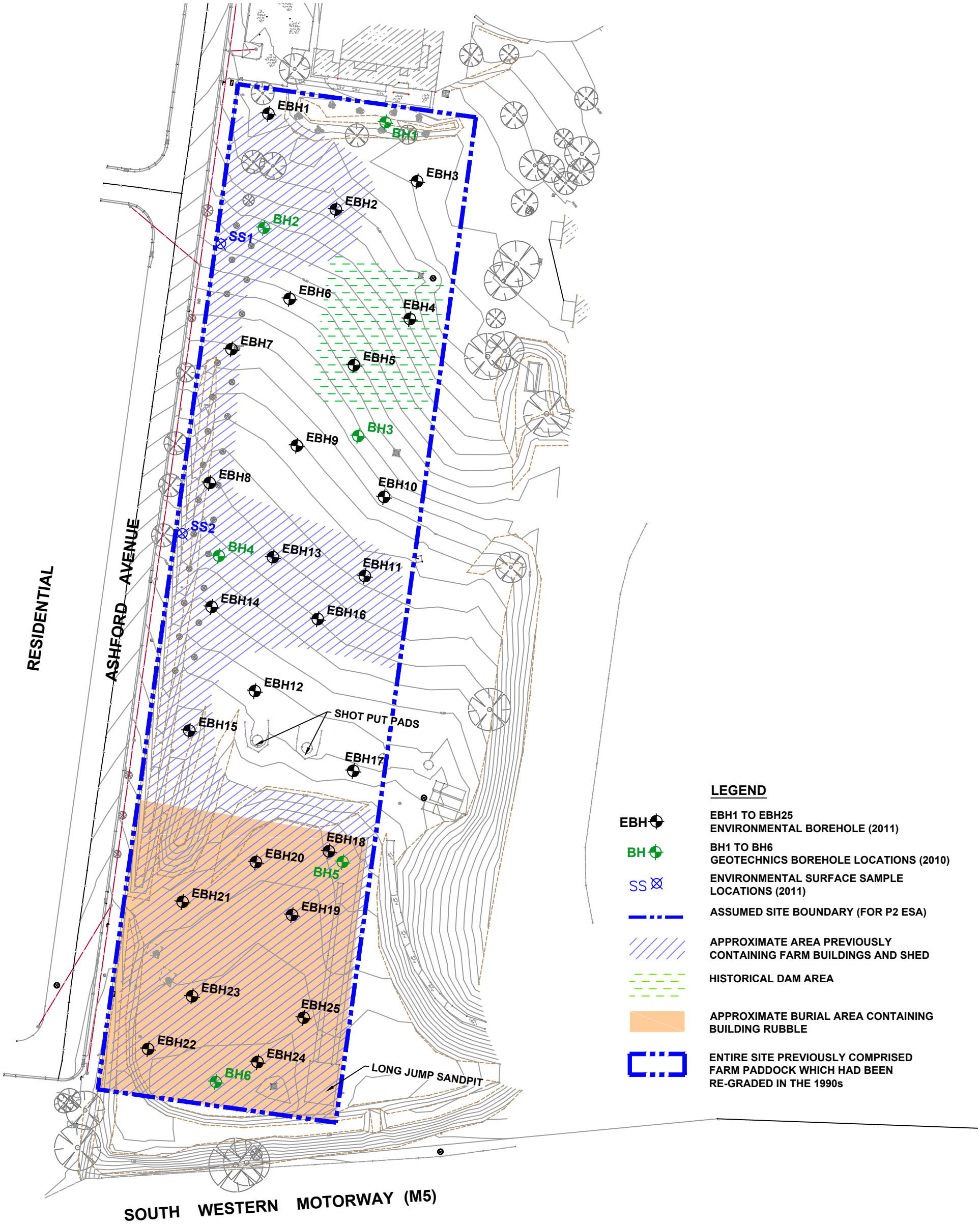
Dr Ian C Swane (CPEng & CEnvP)
Accredited EPA Site Auditor in NSW and NT

Appendix A. Figures & Tables from ESAs & RAP (2011 – 2025)

Coffey Geotechnics (August 2011)

DSI


SITE
BANKSTOWN AIRPORT
2200
BANKSTOWN AIRPORT
2200
CONDELL P
2200
MILPERRA
2214
MILPERRA
2214
PANANIA
2213
PANANIA
2213
Bankstown
Golf Club
Ashford Res
Gordon Parker Reserve
Deepwater Park
Kelso Park
Kelso Park Nth Sporting Complex
Georges River Softball Complex
Former Bankstown Tip
Former Blue Gum Farm Zoo
Killara Reserve
Marco Reserve
Deverall Park
Kinch Res
Bankstown Basketball Stadium
Condell Park High
Milperra Sports Centre
Industrial Area
Paceway
Bankstown Function Cntr
Milperra Business & Delivery Cntr
Hawker de Haviland Aircraft
Australian Aviation Museum
NPWS Flight Operations
Peterson Pk
Beveridge Pk
Amour Park
Skate Park
Tennis
Netball
Golf Course
Clubhouse
Toll Gate
Gate
Res
Milperra Pmy
Panania North Pmy
Gowland Res
Wall Res
Greenway Res
Tracey St Res
Council Depot
Mount St Joseph
University of Western Sydney Bankstown Camp
Milperra Ann Smith Res
Bunnings
Putt Putt Golf
Toby Res
Panania Pmy
Milperra Pmy
Bankstown Pmy
Amour Park
Pav
Tennis
Skate Park
Deepwater Motor Boat Club
Driving Range
Paceway
Function Cntr
Industrial Area
Golf Course
Rotary Park
Kelso
Park
Ck
RIVER
Kelso
Park
Deepwater
Park
Golf
Club
Park
Park
Park



N

10 0 10 30 50

Horizontal Scale (metres) 1:1000

Coffey Environments Australia Pty Ltd

drawn	MV
approved	EW
date	15.07.11
scale	AS SHOWN
original size	A3

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

client: UNIVERSITY OF WESTERN SYDNEY

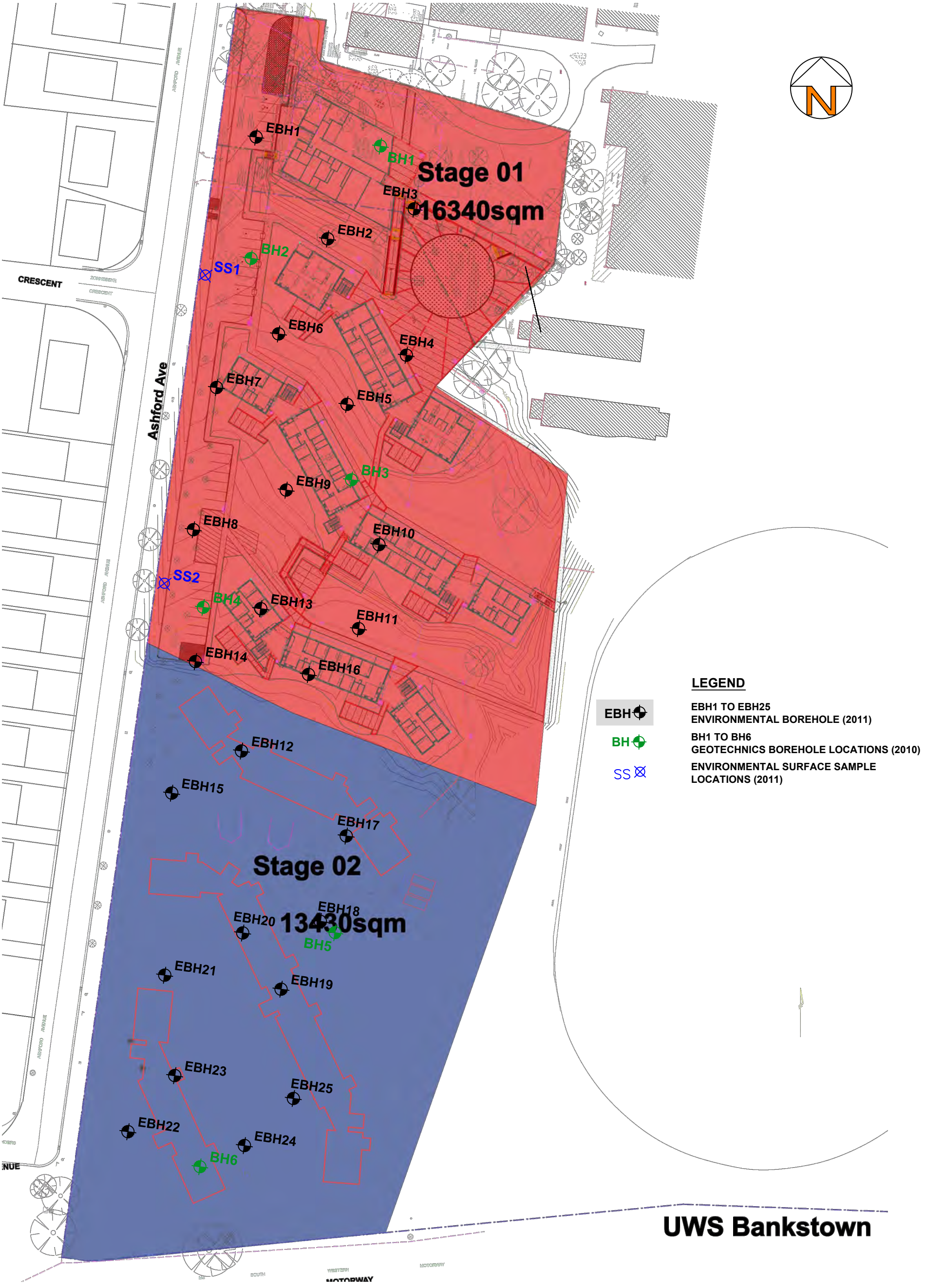
project: PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
STUDENT RESIDENCE DEVELOPMENT,
UWS - BANKSTOWN CAMPUS, MILPERRA, NSW

title: SITE PLAN SHOWING BOREHOLE LOCATIONS

project no: GEOTLCOV24163AD

figure no: FIGURE 2

PLOT DATE: 25/7/2011 5:37 PM DWG FILE: F:\PROJECTS\OTHER OFFICES\GEOTLCOV\GEOTLCOV24163AC_AD\DRAWINGS\GEOTLCOV24163AD.DWG



Coffey Environments Australia Pty Ltd

drawn	MV
approved	EW
date	26.07.11
scale	NTS
original size	A3

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

client: UNIVERSITY OF WESTERN SYDNEY

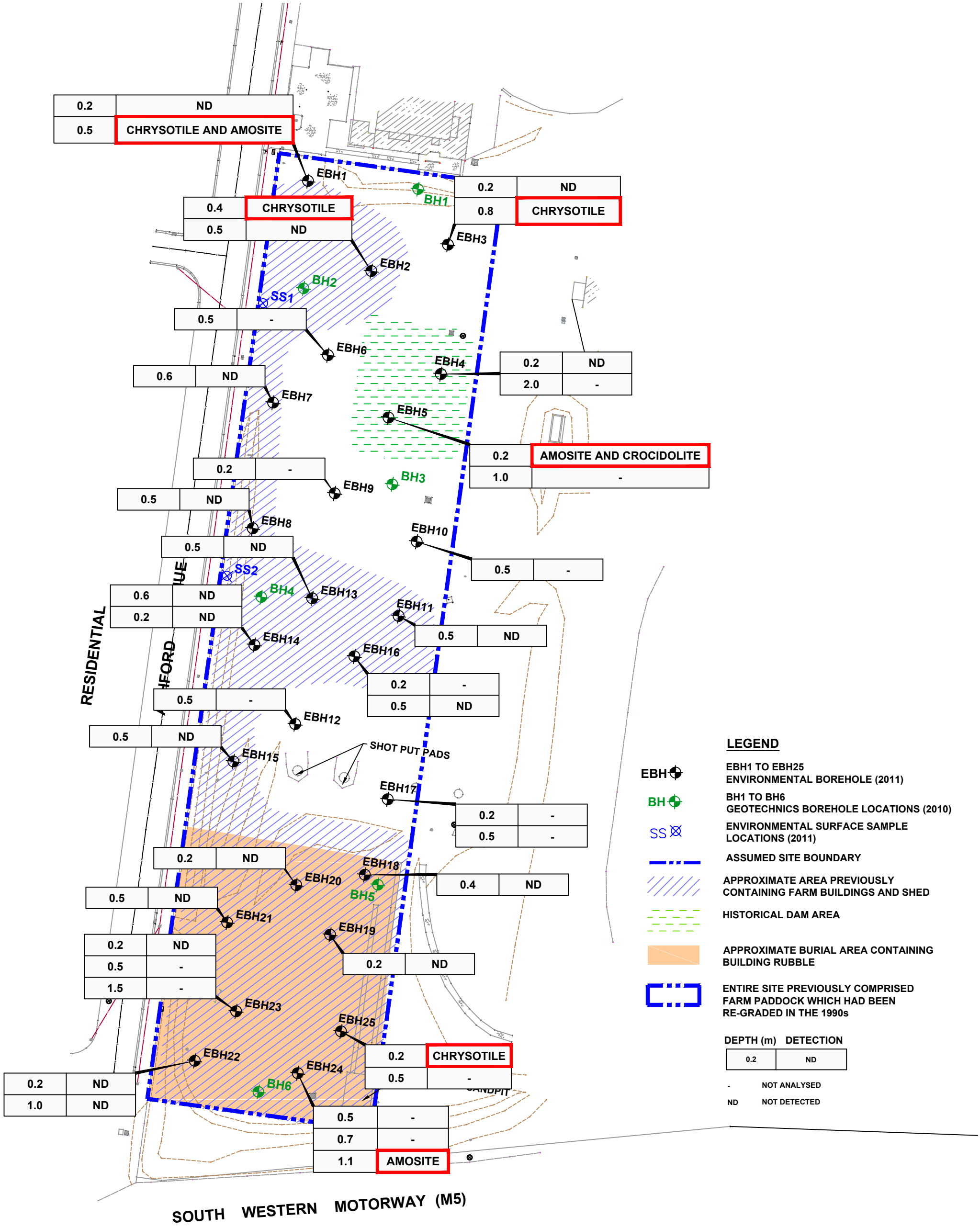
project: PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
STUDENT RESIDENCE DEVELOPMENT,
UWS - BANKSTOWN CAMPUS, MILPERRA, NSW

title: PROPOSED BUILDING DESIGN AND BOREHOLE LOCATIONS

project no: GEOTLCOV24163AD

figure no: FIGURE 3

PLOT DATE: 25/0/2011 5:00 PM DWG FILE: F:\PROJECTS\OTHER OFFICES\GEOTL COV\GEOTL COV24163AC_AD\DRAWINGS\GEOTLCOV24163AD.DWG



Coffey Environments Australia Pty Ltd

drawn	MV
approved	EW
date	27.07.11
scale	AS SHOWN
original size	A3

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

client: UNIVERSITY OF WESTERN SYDNEY

project: PHASE 2 ENVIRONMENTAL SITE ASSESSMENT STUDENT RESIDENCE DEVELOPMENT, UWS - BANKSTOWN CAMPUS, MILPERRA, NSW

title: ASBESTOS DETECTION PLAN

project no: GEOTLCOV24163AD

figure no: FIGURE 4

PLOT DATE: 26/36/2011 5:36 PM DWG FILE: F:\PROJECTS\OTHER OFFICES\GEOTLCOV\GEOTLCOV24163AC_AD\DRAWINGS\GEOTLCOV24163AD.DWG

LR Table 1
Soil Analytical Results
Student Residence Development
University of Western Sydney (UWS) Bankstown Campus

					LocCode	EBH1	EBH1	EBH2	EBH2	EBH3	EBH3	EBH4	EBH4	EBH5	EBH5	EBH6	EBH7	EBH8	EBH9	EBH10	EBH11	EBH12	EBH13	EBH14	EBH14	EBH15
					Sample_Depth_Range	0.2	0.5	0.4	0.5	0.2	0.8	0.2	2	0.2	1	0.5	0.6	0.5	0.2	0.5	0.5	0.5	0.5	0.2	0.6	0.5
					Sampled_Date	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011	12/07/2011
					Lab ID	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1
Analyte	**ChemName**	**Units**	**EQL**	**NEPM 1999 EIL**	**NEPM 1999 HIL A**																					
BTEX	Benzene	mg/kg	0.5		1*	-	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-
	Ethylbenzene	mg/kg	0.5		50*	-	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-
	Toluene	mg/kg	0.5		130*	-	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-
	Xylene (m & p)	mg/kg	1			-	<1	-	-	-	-	-	<1	<1	-	-	-	<1	-	-	-	-	-	-	<1	-
	Xylene (o)	mg/kg	0.5			-	<0.5	-	-	-	-	-	<0.5	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-
	Xylene Total	mg/kg	1.5		25*	-	<1.5	-	-	-	-	-	<1.5	<1.5	-	-	-	<1.5	-	-	-	-	-	-	<1.5	-
Moisture	Moisture	%	0.5			-	15	20	19	13	15	20	11	19	25	17	12	13	12	17	13	11	17	-	11	14
TPH	TPH C6 - C9	mg/kg	20		65*	-	<20	-	-	-	-	-	<20	<20	-	-	-	<20	-	-	-	-	-	-	<20	-
	TPH C10 - C14	mg/kg	20			-	<20	-	-	-	-	-	<20	<20	-	-	-	<20	-	-	-	-	-	-	<20	-
	TPH C15 - C28	mg/kg	50			-	<50	-	-	-	-	-	<50	<50	-	-	-	<50	-	-	-	-	-	-	<50	-
	TPH C29-C36	mg/kg	50			-	<50	-	-	-	-	-	<50	<50	-	-	-	<50	-	-	-	-	-	-	<50	-
	TPH+C10 - C36 (Sum of total)	mg/kg	NA		1000*	-	<120	-	-	-	-	-	<120	<120	-	-	-	<120	-	-	-	-	-	-	<120	-
Metals	Arsenic	mg/kg	3	20	100	-	5	8	8	7	14	6	5	4	6	7	7	6	5	6	5	10	5	-	7	7
	Cadmium	mg/kg	0.3	3	20	-	0.5	0.3	0.4	<0.3	0.6	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	0.4	<0.3	0.6	0.3	-	<0.3	0.4
	Chromium (III+VI)	mg/kg	0.3			-	14	3.8	18	13	17	11	10	7.4	16	16	17	12	13	14	12	23	8.6	-	13	14
	Copper	mg/kg	0.5	100	1000	-	12	28	15	11	22	13	22	8.4	15	15	8.2	14	7.6	12	6.3	7.2	9.8	-	11	12
	Lead	mg/kg	1	600	300	-	33	21	34	18	28	20	13	13	15	18	16	20	12	20	19	25	24	-	24	29
	Nickel	mg/kg	0.5	60	600	-	5.4	9.3	5.8	4.3	5.8	4.1	12	2	3	5.5	3.8	6.4	3.5	6.7	5.5	3.4	3.7	-	4.8	3.3
	Zinc	mg/kg	0.5	200	7000	-	200	100	120	29	72	44	56	22	12	29	14	40	13	28	18	13	48	-	58	33
	Mercury	mg/kg	0.05	1	15	-	<0.05	0.09	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05
OCPs	2,4-DDT	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	4,4-DDE	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	a-BHC	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Aldrin	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	b-BHC	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Chlordane (cis)	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Chlordane (trans)	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	d-BHC	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	DDD	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	DDT	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Dieldrin	mg/kg	0.2			-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2
	Endosulfan I	mg/kg	0.2			-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2
	Endosulfan II	mg/kg	0.2			-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2
	Endosulfan sulphate	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Endrin	mg/kg	0.2			-	<0.2	-	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2
	Endrin aldehyde	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Endrin ketone	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	g-BHC (Lindane)	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Heptachlor	mg/kg	0.1		10	-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Hexachlorobenzene	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Methoxychlor	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	o,p-DDD	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	o,p'-DDE	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	trans-Nonachlor	mg/kg	0.1			-	<0.1	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Aldrin + Dieldrin	mg/kg	0.3		10	-	<0.3	-	<0.3	<0.3	-	-	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3
	DDT+DDE+DDD	mg/kg	0.3		200	-	<0.3	-	<0.3	<0.3	-	-	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3
PCBs	Arochlor 1016	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1221	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1232	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1242	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1248	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1254	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1260	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Arochlor 1268	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aroclor 1262	mg/kg	0.1			-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PCBs (Sum of total)	mg/kg	0.9		10	-	-	-	-	<0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAHs	Acenaphthene	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	-	-	-	-	-	-	-	-	-	-	-
	Anthracene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Benz(a)anthracene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	mg/kg	0.1		1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Benzo(b)fluoranthene	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(k)fluoranthene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Chrysene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Fluoranthene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Fluorene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Naphthalene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Phenanthrene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	Pyrene	mg/kg	0.1			-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
	PAHs (Sum of total)	mg/kg	1.75		20	-	-	-	-	-	-	<1.75	<1.75	<1.75	<1.75	-	-	-	-	-	-	-	-	-	-	-
Materials	Asbestos	-	-	Detection	Detection	ND	Chrysotile and Amosite	Chrysotile	ND	ND	Chrysotile	ND	-	Amosite and Crocidolite	-	-	ND	ND	-	-	ND	-	ND	ND	ND	ND

Notes:
* Service Station Guideline 1994
BOLD Concentration above adopted assessment guidelines

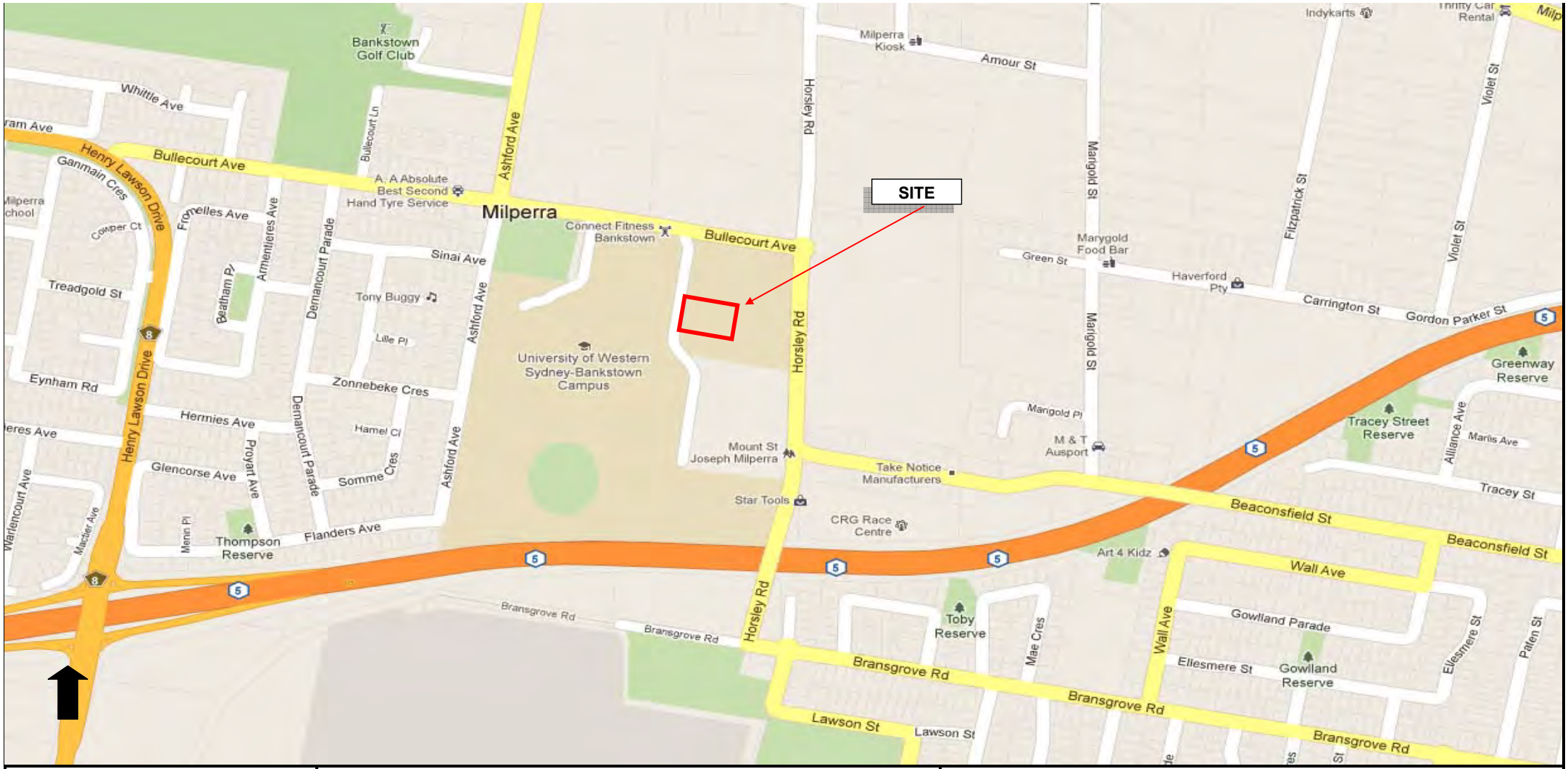
LR Table 1
Soil Analytical Results
Student Residence Development
University of Western Sydney (UWS) Bankstown Campus

				LocCode	EBH16	EBH16	EBH17	EBH17	EBH18	EBH19	EBH20	EBH21	EBH22	EBH22	EBH23	EBH23	EBH23	EBH24	EBH24	EBH24	EBH25	EBH25
				Sample_Depth_Range	0.2	0.5	0.2	0.5	0.4	0.2	0.2	0.5	0.2	1	0.2	0.5	1.5	0.5	0.7	1.1	0.2	0.5
				Sampled_Date	12/07/2011	12/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011	11/07/2011
				Lab ID	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1	SE100887-1
ChemName	**Units**	**EQL**	**NEPM 1999 EIL**	**NEPM 1999 HIL A**																		
Benzene	mg/kg	0.5		1*	-	-	-	-	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-
Ethylbenzene	mg/kg	0.5		50*	-	-	-	-	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-
Toluene	mg/kg	0.5		130*	-	-	-	-	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-
Xylene (m & p)	mg/kg	1			-	-	-	-	-	-	-	<1	-	<1	-	<1	-	-	-	<1	<1	-
Xylene (o)	mg/kg	0.5			-	-	-	-	-	-	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	<0.5	-
Xylene Total	mg/kg	1.5		25*	-	-	-	-	-	-	-	<1.5	-	<1.5	-	<1.5	-	-	-	<1.5	<1.5	-
Moisture	%	0.5			18	11	13	21	12	15	12	11	15	16	15	17	16	23	20	21	12	22
TPH C6 - C9	mg/kg	20		65*	-	-	-	-	-	-	-	<20	-	<20	-	<20	-	-	-	<20	<20	-
TPH C10 - C14	mg/kg	20			-	-	-	-	-	-	-	<20	-	<20	-	<20	-	-	-	<20	<20	-
TPH C15 - C28	mg/kg	50			-	-	-	-	-	-	-	<50	-	<50	-	<50	-	-	-	<50	<50	-
TPH C29-C36	mg/kg	50			-	-	-	-	-	-	-	<50	-	<50	-	<50	-	-	-	<50	<50	-
TPH+C10 - C36 (Sum of total)	mg/kg	NA		1000*	-	-	-	-	-	-	-	<120	-	<120	-	<120	-	-	-	<120	<120	-
Arsenic	mg/kg	3	20	100	16	8	5	6	14	6	8	<3	3	4	6	-	4	5	-	8	9	8
Cadmium	mg/kg	0.3	3	20	0.7	0.5	0.4	<0.3	0.5	0.3	0.4	<0.3	<0.3	<0.3	0.4	-	0.4	<0.3	-	<0.3	0.4	0.6
Chromium (III+VI)	mg/kg	0.3			17	17	13	12	7.5	9.2	17	7	5.3	8.3	9.3	-	9.2	11	-	14	11	37
Copper	mg/kg	0.5	100	1000	22	7.4	10	8.2	20	15	12	5.6	19	18	17	-	29	8.5	-	11	12	10
Lead	mg/kg	1	600	300	34	29	34	11	35	20	21	10	17	16	26	-	19	13	-	16	25	19
Nickel	mg/kg	0.5	60	600	6.4	3.2	4.4	1.8	3.3	6.1	3	2.6	14	15	6.8	-	32	4	-	4.5	2.8	3.9
Zinc	mg/kg	0.5	200	7000	77	50	58	3.9	150	50	88	41	56	48	120	-	150	16	-	20	85	11
Mercury	mg/kg	0.05	1	15	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	<0.05
2,4-DDT	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
4,4-DDE	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
a-BHC	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Aldrin	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
b-BHC	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Chlordane (cis)	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Chlordane (trans)	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
d-BHC	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
DDD	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
DDT	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Dieldrin	mg/kg	0.2			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	<0.2	-	-	-	-	<0.2
Endosulfan I	mg/kg	0.2			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	<0.2	-	-	-	-	<0.2
Endosulfan II	mg/kg	0.2			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	<0.2	-	-	-	-	<0.2
Endosulfan sulphate	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Endrin	mg/kg	0.2			-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	<0.2	-	-	-	-	<0.2
Endrin aldehyde	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Endrin ketone	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
g-BHC (Lindane)	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Heptachlor	mg/kg	0.1		10	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Heptachlor epoxide	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Hexachlorobenzene	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Methoxychlor	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
o,p-DDD	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
o,p'-DDE	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
trans-Nonachlor	mg/kg	0.1			-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	<0.1
Aldrin + Dieldrin	mg/kg	0.3		10	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-	-	<0.3	-	-	-	-	<0.3
DDT+DDE+DDD	mg/kg	0.3		200	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-	-	<0.3	-	-	-	-	<0.3
Arochlor 1016	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1221	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1232	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1242	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1248	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1254	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1260	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Arochlor 1268	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
Aroclor 1262	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-
PCBs (Sum of total)	mg/kg	0.9		10	-	-	-	-	-	-	-	-	-	<0.9	-	-	-	-	<0.9	-	-	-
Acenaphthene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Acenaphthylene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Anthracene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Benz(a)anthracene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Benzo(a) pyrene	mg/kg	0.1		1	-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Benzo(b)fluoranthene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<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	-	<0.1	-	<0.1
Benzo(k)fluoranthene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Chrysene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Dibenz(a,h)anthracene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Fluoranthene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Fluorene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Naphthalene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Phenanthrene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
Pyrene	mg/kg	0.1			-	-	-	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1
PAHs (Sum of total)	mg/kg	1.75		20	-	-	-	-	-	-	-	-	-	<1.75	-	<1.75	<1.75	<1.75	-	<1.75	-	<1.75
Asbestos	-	-	Detection	Detection	-	ND	-	-	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	Amosite	Chrysotile	-

itation Guideline 1994
Concentration above adopted assessment guidelines

Noel Arnold & Associates (October 2011)

ESA



Noel Arnold & Associates RISK MANAGEMENT SERVICES	**Legend**		**Project Details**	
		Approximate Site Location	Client Name:	JDH Architects
Level 2, 11-17 Khartoum Road			Client Number:	SJ0085
North Ryde, NSW 2113	**Details of Map**		Project Number:	95458
Ph: 02-9889-1800			Project Description:	Soil Contamination Investigation
Fx: 02-9889-1811			Address:	Bullecourt Avenue, Milperra NSW
www.noel-arnold.com.au	Image Source:	www.googlemaps.com	Figure Name:	Site Locality Map



Noel Arnold & Associates RISK MANAGEMENT SERVICES	**Legend**		**Project Details**	
	⊗	Indicative Sample location	Client Name:	JDH Architects
Level 2, 11-17 Khartoum Road	▭	Approximate New Work Boundary	Client Number:	SJ0085
North Ryde, NSW 2113			Project Number:	95458
Ph: 02-9889-1800			Project Description:	Soil Contamination Investigation
Fx: 02-9889-1811	**Details of Photo**		Address:	Bullecourt Avenue, Milperra NSW
www.noel-arnold.com.au	Image Source:	www.nearmap.com	Figure Name:	Site Locality Map

Report Name:	Soil Contamination Investigation		
Site Address:	Bullecourt Avenue, Milperra NSW		
Client Name:	JDH Architects		
Client Number:	SJ0085	**Job Number:**	95458

Soil Contamination Investigation	**Heavy Metals (mg/kg)**								**PAH (mg/kg)**	
	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)	Benzo (a) Pyrene	Total PAH
Health Based Investigation Level	100	20	100	1000	300	15	600	7000	1	20
Provisional Phytotoxicity Investigation Level	20	3	400	100	600	1	60	200	-	-
Soil Sample ID										
HA01-0.3	9	<0.5	24	23	16	<0.1	3	29	<0.05	<PQL
HA01-0.9	5	<0.5	10	20	11	<0.1	2	18	<0.05	<PQL
HA02-0.2	7	<0.5	15	12	15	<0.1	3	31	<0.05	<PQL
HA02-1.0	4	<0.5	6	15	10	<0.1	<1	7	<0.05	<PQL
HA03-0.2	6	<0.5	14	7	12	<0.1	2	9	<0.05	<PQL
HA03-0.9	11	<0.5	14	15	12	<0.1	1	8	<0.05	<PQL
HA04-0.3	8	<0.5	14	8	15	<0.1	3	26	<0.05	<PQL
HA04-1.1	8	<0.5	8	15	12	<0.1	2	11	<0.05	<PQL
HA05-0.2	9	0.6	15	16	74	<0.1	4	180	<0.05	<PQL
HA05-1.0	12	<0.5	8	17	12	<0.1	1	40	<0.05	<PQL
HA06-0.1	7	<0.5	14	20	14	<0.1	1	27	<0.05	<PQL
HA06-0.8	7	<0.5	15	15	38	<0.1	5	110	<0.05	<PQL
HA07-0.1	7	<0.5	12	17	12	<0.1	2	11	<0.05	<PQL
HA07-0.8	7	<0.5	17	8	14	<0.1	3	16	<0.05	<PQL
HA08-0.3	9	<0.5	24	20	12	<0.1	3	17	<0.05	<PQL
HA08-0.9	<4	<0.5	7	11	9	<0.1	<1	5	<0.05	<PQL

Soil Contamination Investigation	TRH (mg/kg)					BTEX (mg/kg)			
	C6-C9	C10-C14	C15-C28	C29-C36	Total (C10-C36)	Benzene	Toluene	Ethylbenzene	Xylene
Health Based Investigation Level	65	-			1000	1	130	50	25
Provisional Phytotoxicity Investigation Level	-	-	-	-	-	-	-	-	-
Soil Sample ID									
HA01-0.3	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA01-0.9	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA02-0.2	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA02-1.0	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA03-0.2	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA03-0.9	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA04-0.3	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA04-1.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA05-0.2	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA05-1.0	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA06-0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA06-0.8	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA07-0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA07-0.8	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA08-0.3	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3
HA08-0.9	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3

"Column 1: Commercial and Industrial" Criteria adapted from NSW DEC Guidelines for the NSW Site Auditor Scheme 2nd Edition, 2006
"Service Station Guidelines" Criteria adapted from the NSW EPA Guidelines on Assessing Service Station Sites, 1994
Note: "PQL" = Practical Quantitation Limit

	Indicates "Complies with HIL and PPIL"
	Indicates "Exceeds HIL"
	Indicates "Exceeds PPIL"

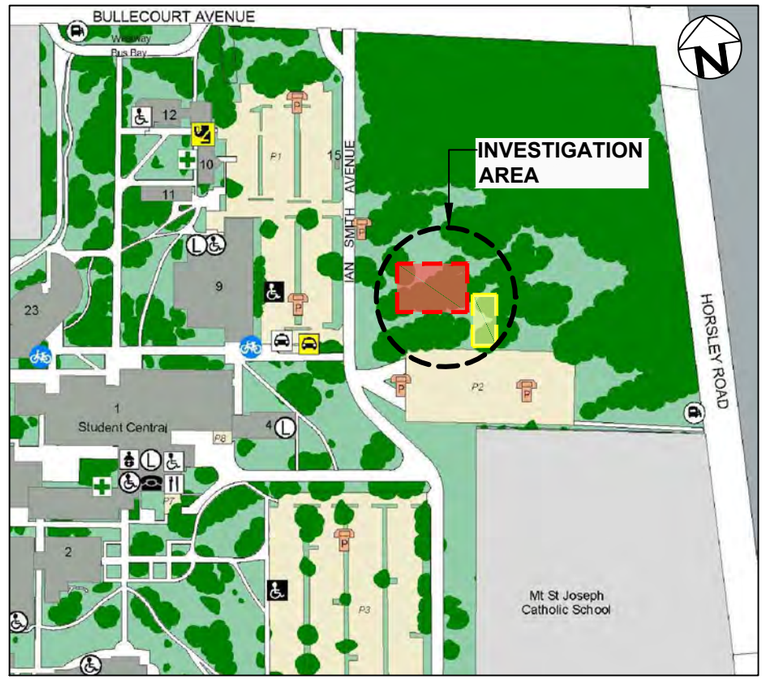
Report Name	Soil Contamination Investigation
Site Address:	Bullecourt Avenue, Milperra NSW
Client Name:	JDH Architects
Client Number:	SJ0085 **Job Number:** 95458
Table D: QA/QC Table	

Data Evaluation			
Total QA/QC Samples:	1	Percentage of Acceptable Results	100%
Acceptable QA/QC Samples:	1		

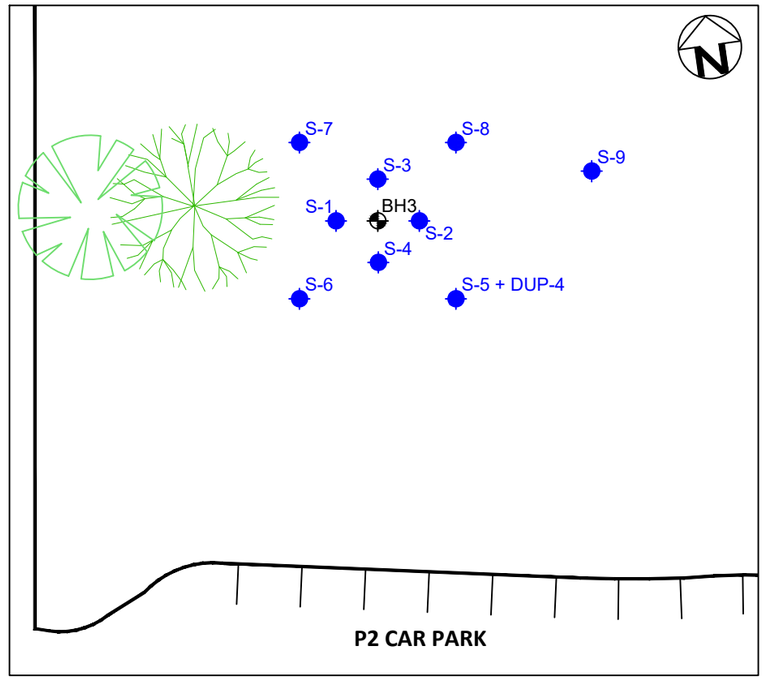
Soil Contamination Investigation	**Type**				**Heavy Metals (mg/kg)**								**BTEX (mg/kg)**				**PAH (mg/kg)**		**TRH (mg/kg)**				
	Primary Sample	**Blind Replicate**	**Split Replicate**	**Rinsate**	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Nickel (Ni)	Zinc (Zn)	Benzene	Toluene	Ethylbenzene	Xylene	Naphthalene	Benzo(a)Pyrene	C6-C9	C10-C14	C15-28	C29-C36	Total (C6-C39)
Soil Sample ID																							
HA08-0.3	X				9	<0.5	24	20	12	<0.1	3	17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B01		X			8	<0.5	22	18	11	<0.1	2	13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
% RPD					12%	*	9%	11%	9%	*	40%	27%	*	*	*	*	*	*	*	*	*	*	*

	Indicates "Within Acceptable %RPD"
	Indicates "Exceeds Acceptable %RPD"
*	Indicates %RPD has not been calculated as PQL has not been exceeded in either sample





LOCALITY PLAN



INSERT 1 - ENVIRONMENTAL SAMPLING PLAN

LEGEND

- BOREHOLE LOCATION
- DELINEATION SAMPLING LOCATION

revision	description	drawn	approved	date

drawn	DB/AW
approved	-
date	17/06/11
scale	NTS
original size	**A3**

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

client:	UNIVERSITY OF WESTERN SYDNEY
project:	GEOTECHNICAL INVESTIGATION CHILDCARE CENTRE BANKSTOWN CAMPUS, BANKSTOWN, NSW
title:	SITE PLAN SHOWING BOREHOLE LOCATIONS
project no: GEOTLCOV24258AA	figure no: FIGURE 1

PLOT DATE: 17/04/2011 1:54 PM DWG FILE: F:\GEOTECHNICS\1 PROJECTS\GEOTLCOV\242\GEOTLCOV24258AA UWS CHILDCARE CENTRE AT BANKSTOWN CAMPUS\FIGURES\GEOTLCOV24258AA_FIGURE 1.DWG

GEOTLCOV24258AA

SUMMARY OF RESULTS (SOIL)

Results are in mg/kg unless stated

Sample ID			BH1	BH1	BH2	BH2	BH3	BH3	S1	S2	S3	S4	S5	S6	S7	S8	S9
Depth of Sampling (m)	THRESHOLD		0.0-0.2	0.6-0.8	0.0-0.2	0.6-0.8	0.0-0.2	0.6-0.8	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date of Sampling	CONCENTRATION		02-Jun-11	02-Jun-11	02-Jun-11	02-Jun-11	02-Jun-11	02-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11	10-Jun-11
Material	HIL A[1]	Phytotox[3]	Fill/Topsoil	Residual	Fill/Topsoil	Residual	Fill/Topsoil	Residual	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil	Fill/Topsoil
HEAVY METALS																	
Arsenic	100	20	2.9	5	4	4.4	4.8	6	1.9	<1	<1	2.9	1.1	1.3	<1	2.9	1.9
Cadmium	20	3	<0.1	<0.1	<0.1	<0.1	8.1	0.1	0.2	1.2	0.3	0.5	0.2	0.1	1.3	0.1	0.2
Chromium	120000 [4]	400 [4]	9.2	16	13	19	11	15	<2	5.1	<2	2.2	2.1	2	3.1	2.6	<2
Copper	1000	100	5.3	8.1	7.2	14	74	8.7	5.7	28	10	12	15	7.2	37	14	9.4
Lead	300	600	9.1	14	55	18	4400	19	190	1800	130	95	220	40	140	98	210
Mercury	15	1	<0.05	0.05	0.07	0.07	0.12	<0.05	0.1	0.09	0.07	0.07	0.14	0.1	0.08	0.09	<0.05
Nickel	600	60	1	<1	1.6	1.1	7.5	<0.1	1.6	3.3	1.3	4.4	2.8	1.9	2.5	2.5	1.9
Zinc	7000	200	15	10	21	15	6800	33	110	270	68	98	130	55	240	100	77
TOTAL PETROLEUM HYDROCARBONS (TPH)																	
C6 - C9 Fraction	65 [5]		<10	-	<10	-	<10	-	-	-	-	-	-	-	-	-	-
C10 - C14 Fraction			<50	-	<50	-	<50	-	-	-	-	-	-	-	-	-	-
C15 - C28 Fraction			<100	-	<100	-	<100	-	-	-	-	-	-	-	-	-	-
C29 - C36 Fraction			<100	-	<100	-	290	-	-	-	-	-	-	-	-	-	-
Total C10-C36	1000 [5]		<LOR	-	<LOR	-	290	-	-	-	-	-	-	-	-	-	-
BTEX																	
Benzene	1 [5]		<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Toluene	130 (1.4) [5,6]		<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	50 (3.1) [5,6]		<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Total Xylenes	25 (14) [5,6]		<1.5	-	<1.5	-	<1.5	-	-	-	-	-	-	-	-	-	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)																	
Naphthalene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Acenaphthylene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Acenaphthene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Fluorene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Phenanthrene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Anthracene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Fluoranthene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Pyrene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Chrysene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Benzo(b,k)fluoranthene			<1	-	<1	-	<1	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	1 [1]		<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene			<0.5	-	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-
Total PAHs	20 [1]		<LOR	-	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-
ORGANOCHLORINE PESTICIDES (OCP)			<LOR	-	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-
POLYCHLORINATED BIPHENYLS (PCB)			<LOR	-	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-
ASBESTOS			<LOR	-	<LOR	-	<LOR	-	-	-	-	-	-	-	-	-	-
LEACHABILITY BASED ON TCLP (mg/L)																	
Arsenic			-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-
Cadmium			-	-	-	-	0.078	-	-	-	-	-	-	-	-	-	-
Chromium			-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Copper			-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Lead			-	-	-	-	10	-	-	-	-	-	-	-	-	-	-
Mercury			-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-
Nickel			-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Zinc			-	-	-	-	49	-	-	-	-	-	-	-	-	-	-

NOTES:

	Concentration exceeds NEHF A criteria
Bold	Concentration exceeds phytotoxicity-based criteria
[1]	NSW DEC (2006) Guildines for the NSW Site Auditor Scheme, HIL A
[3]	NSW DEC (2006) Guildelines for the NSW Site Auditor Scheme, Phytotoxicity Criteria
[4]	Based on criteria for Chromium (III)
[5]	NSW EPA (1994) Guidelines for Assessing Service Station Sites, Table 3
[6]	Value in bracket refers to protection for terrestrial organism in soil
<LOR	Below laboratory's limit of reporting
-	Not Analysed

JBS&G (February 2018)

PSI

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

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SITE

Bankstown Golf Club
Blaxland Place
Ashford Avenue
Works Place
Horsley Road
Ladbroke Street
Milperra
Marigold Street
A34
Milperra Road
Amour Street
Fitzpatrick Street
Whittle Avenue
Keysor Place
Ingram Avenue
Bullecourt Avenue
Gannain Crescent
Henry Lawson Drive
Fromelles Avenue
Milperra
Sinai Avenue
Milperra Reserve
Green Street
Carrington Street
Amiens Avenue
Eynham Road
Treadgold Street
Arminteres Avenue
Dernacourt Avenue
Messines Avenue
Lille Place
Zonnebeke Crescent
Hermies Avenue
Somme Crescent
Pozieres Road
Milperra Primary
Glencorse Avenue
Proyart Avenue
Warlencourt Avenue
Mactier Avenue
Chauvel Avenue
Flanders Avenue
M5 Motorway
M5 Motorway Onramp
Henry Lawson Drive
Bransgrove Road
Mt St Joseph Catholic School
Marigold Place
Revesby
Beaconsfield Street
Panania
Wall Avenue
Toby Crescent
Mae Crescent
Panania North Primary
Gowland P
Lawson Street
Killara Reserve
Kelso Creek
Killara Avenue
Dowding Street
Laundess Avenue
Lindsay Street
Benfield Parade
Baldi Avenue
Windermere Crescent
Dickerson Street
Matts Avenue

Legend:

Approximate Site Boundary

JBS&G

Job No: 54086	
Client: Western Sydney University	
Version: R01 Rev A	Date: 11-Sep-2017
Drawn By: BC	Checked By: KL

Scale 1:10,000

0 120 240
metres

Coor. Sys. GDA 1994 MGA Zone 56

2 Bullecourt Avenue
Milperra, NSW

SITE LOCATION

FIGURE 1

File Name: 54086_01
Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf



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Legend:

- Approximate Site Boundary
- Burial Area Containing Building Rubble (Coffey 2011)

JBS&G

Job No: 54086

Client: Western Sydney University

Version: R01 Rev A	Date: 12-Sep-2017
Drawn By: BC	Checked By: KL

Scale 1:4,000

0 40 80
metres

Coor. Sys. GDA 1994 MGA Zone 56

2 Bullecourt Avenue
Milperra, NSW

SITE LAYOUT

FIGURE 2

File Name: 54086_02
Reference: Nearmaps - http://www.nearmap.com.au/. Imagery - 09-08-2017.



SS10 Analyte	Date	Concentration (mg/kg)	Criteria		
			HIL B	HIL C	HIL D
Asbestos from ACM in Soil	23-Aug-17	0.02			

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Legend:

- Approximate Site Boundary
- Burial Area Containing Building Rubble (Coffey 2011)
- Sample Location

Note:
HIL B = NEPM 2013 Soil HIL B
HIL C = NEPM 2013 Soil HIL C
HIL D = NEPM 2013 Soil HIL D

JBS&G

Job No: 54086

Client: Western Sydney University

Version: R01 Rev A	Date: 12-Sep-2017
Drawn By: BC	Checked By: KL

Scale 1:4,000

0 40 80
metres

Coor. Sys. GDA 1994 MGA Zone 56

2 Bullecourt Avenue
Milperra, NSW

SAMPLING LOCATIONS & EXCEEDANCES

FIGURE 3

File Name: 54086_03
Reference: Nearmaps - http://www.nearmap.com.au/. Imagery - 09-08-2017.

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

Table A - Analytical Results Summary
Project Number: 54086
Project Name: Phase 1 Environmental Site Assessment - Western Sydney University

			Metals & Metalloids								Polycyclic Aromatic Hydrocarbons																										Organochlorine Pesticides																										Asbestos									
			Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[a]pyrene TEQ (lower bound)*	Benzo[a]pyrene TEQ (medium bound)*	Benzo[a]pyrene TEQ (upper bound)*	Benzo[b,j]fluoranthene	Benzo[b,j]fluorene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total (Total)	4,4-DDE	Aldrin	alpha-BHC	beta-BHC	Dieldrin	Aldrin+Dieldrin	DDD	DDT	DDT+DDE+DDD	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	Total OCPs	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	%w/w	%w/w	g	g	g	g	g	g	g
EQL			2.00	0.40	5.00	5.00	5.00	0.10	5.00	5.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.15	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.20	1.00											
NEPM 2013 Soil HIL B			500	150	500	30,000	1200	120	1200	60,000						4	4	4												400					10			600	90								10			0.05	0.05	500	30			0.04	0.001									
NEPM 2013 Soil HIL C			300	90	300	17,000	600	80	1200	30,000						3	3	3												300					10			400	70								10			0.05	0.05	400	30			0.02	0.001									
NEPC 2013 Soil HIL D			3000	900	3600	240,000	1500	730	6000	400,000						40	40	40												4000					45			3600	530								100			0.05	0.05	2500	160			0.05	0.001									
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																												5																																								
NEPC 2013 Soil ESLs (fine grained)																0.7																																																			
Field_ID	Date	Report #																																																																				
SS01	23-Aug-17	559858	4.90	<0.4	12.00	23.00	58.00	0.30	10.00	86.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	0.60	<0.5	0.70	<0.5	<0.5	<0.5	<0.5	0.80	2.10	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	0.20	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	0.20	760.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS02	23-Aug-17	559858	4.80	<0.4	13.00	29.00	59.00	0.60	8.00	93.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	841.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS03	23-Aug-17	559858	4.60	<0.4	11.00	14.00	30.00	<0.1	5.20	110.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	671.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS04	23-Aug-17	559858	3.00	<0.4	5.00	11.00	16.00	<0.1	<5	72.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	571.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS05	23-Aug-17	559858	4.60	<0.4	7.50	8.70	10.00	<0.1	<5	25.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	589.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS06	23-Aug-17	559858	3.50	<0.4	8.20	9.40	9.10	<0.1	5.80	32.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	666.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
QC20170823 (Dup of SS06)	23-Aug-17	559858	3.50	<0.4	10.00	11.00	10.00	<0.1	6.10	41.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	620.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS07	23-Aug-17	559858	6.40	<0.4	11.00	23.00	23.00	<0.1	14.00	87.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	637.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS08	23-Aug-17	559858	8.60	<0.4	12.00	15.00	45.00	<0.1	8.20	100.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	583.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS09	23-Aug-17	559858	<2	<0.4	6.10	12.00	17.00	<0.1	<5	58.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	647.00	<0.001	<0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS10	23-Aug-17	559858	5.00	<0.4	15.00	24.00	47.00	<0.1	6.80	120.00	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.60	1.20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	<0.05	<0.1	<0.15	<0.05	<0.05	<0.15	<0.1	<0.05	<0.05	0.05	0.26	0.65	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.1	811.00	<0.001	0.02	0.00	0.00	0.00	0.26	0.15	0.00	0.02

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1930

FIGURE: 1930

File Name: 54086_1930
Reference: Land and Property Information, NSW



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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1943

FIGURE: 1943

File Name: 54086_1943
Reference: Land and Property Information, NSW

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1955

FIGURE: 1955

File Name: 54086_1955
Reference: Land and Property Information, NSW



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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200
metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1965

FIGURE: 1965

File Name: 54086_1965
Reference: Land and Property Information, NSW

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1975

FIGURE: 1975

File Name: 54086_1975
Reference: Land and Property Information, NSW

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1986

FIGURE: 1986

File Name: 54086_1986
Reference: Land and Property Information, NSW



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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 30-Aug-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 1994

FIGURE: 1994

File Name: 54086_1994
Reference: Land and Property Information, NSW

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 12-Sep-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

HISTORICAL AERIAL PHOTOGRAPH- 2004

FIGURE: 2004

File Name: 54086_2004
Reference: Google Earth Imagery 25-06-2004.

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Legend:

Approximate Site Boundary

JBS&G

Job No: 54086

Client: Western Sydney University

Version: Aerials	Date: 12-Sep-2017
Drawn By: AV	Checked By: KL

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

Horsley & Bullecourt Road
Milperra NSW

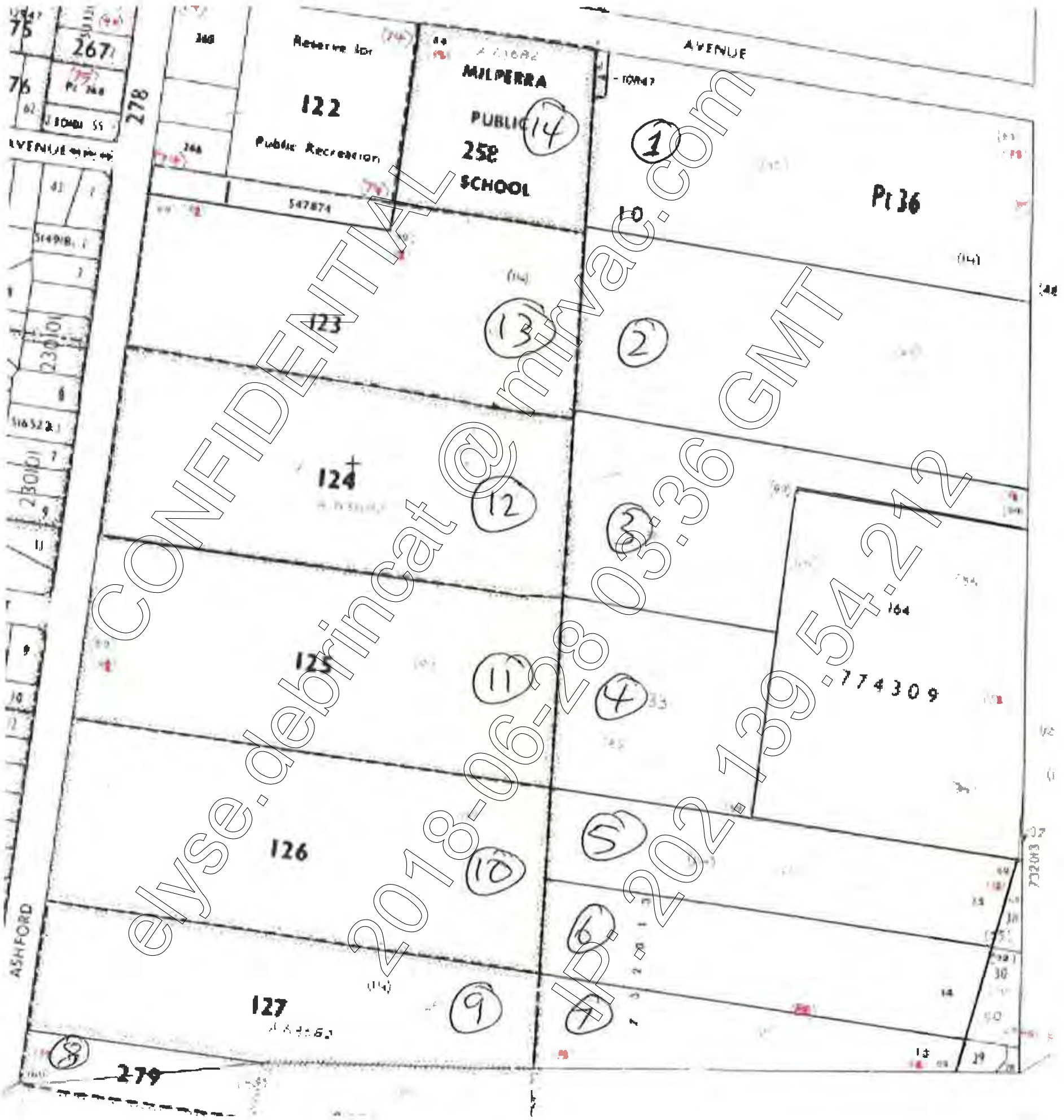
AERIAL PHOTOGRAPH- 2017

FIGURE: 2017

File Name: 54086_2017
Reference: Nearmap - https://www.nearmap.com.au/. Imagery 09-08-2017.

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U9137-34



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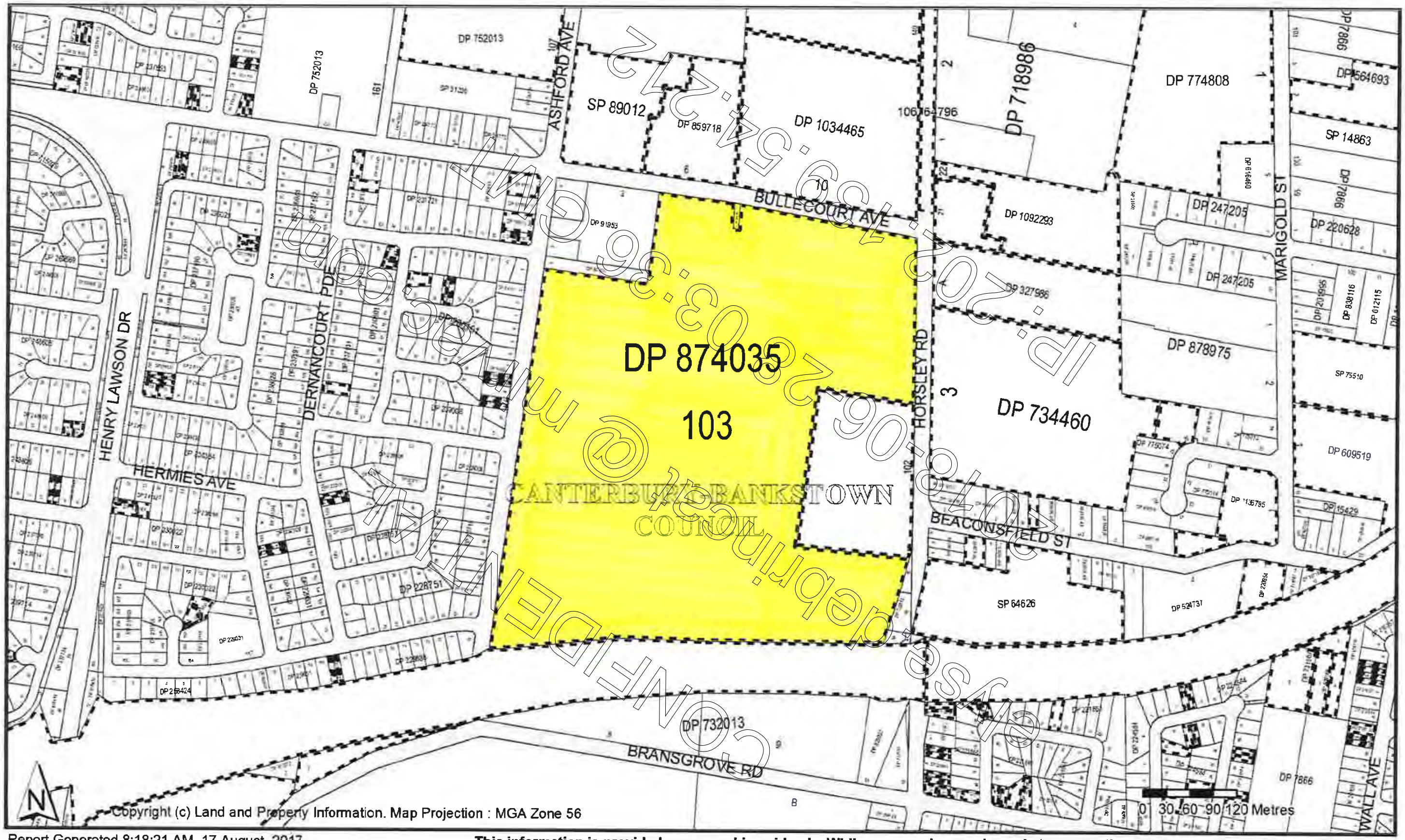
01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 103 DP 874035 **Identified Parcel** : Lot 103 DP 874035

Locality : MILPERRA **LGA** : CANTERBURY-BANKSTOWN **Parish** : BANKSTOWN **County** : CUMBERLAND



Copyright (c) Land and Property Information. Map Projection : MGA Zone 56

LIVING CITY 2017-03-27 10:27:02 Please refer to DOCUMENT ONLY

Report Generated 8:18:21 AM, 17 August, 2017

Copyright © Land and Property Information ABN: 23 519 493 925

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. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

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Section B Specification

Project – Bankstown Campus Redevelopment

Figure 1: Existing Bankstown Campus Site



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Req:R222433 /Doc:DP 0874035 P /Rev:12-Jan-1998 /Sts:OK.OK /Pgs:ALL /Prt:21-Aug-2017 10:38 /Seq:1 of 1
Ref:Milperra /Src:M
01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

PLAN FORM 2 — Plan Drawing only to appear in this space — * OFFICE USE ONLY

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

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No .....

Field Book ..... pages .....

Council's Certificate

I hereby certify that –

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans); and

*(b) the requirements of Part 3 Division 2 of the Water Board Act 1987, or Part 3 Division 7 of the Hunter Water Board (Corporatisation) Act 1991

have been complied with for the purposes in relation to the BOUNDARY READJUSTMENT

Subdivision No. 69/97

Date 27/10/97

Signature .....

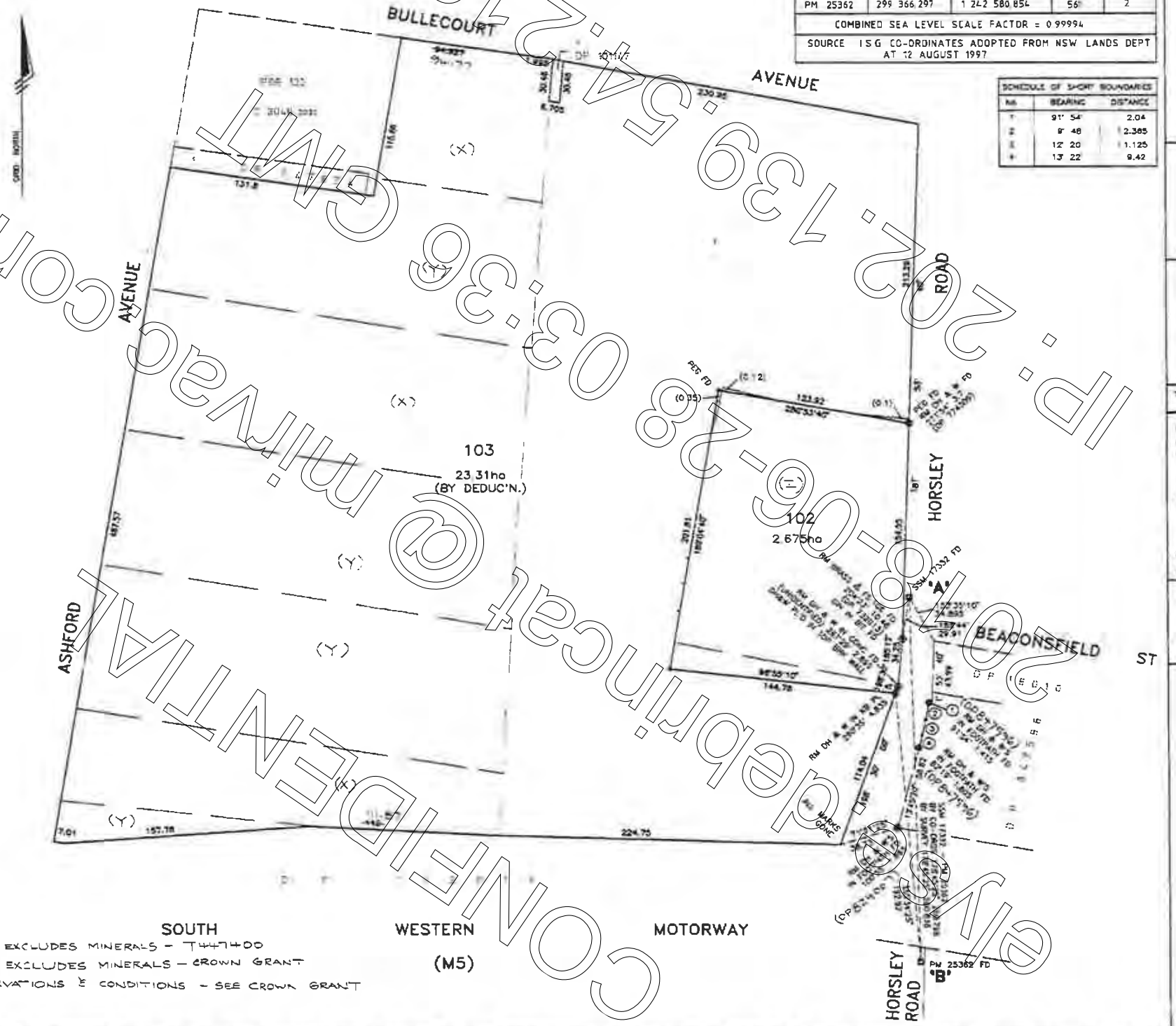
Council File No. .....

* This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd

† Delete if inapplicable

SURVEY PRACTICE REGULATIONS 1990 CLAUSE 32(2)				
MARK	I.S.G. CO-ORDINATES		ZONE	ACC
	EASTING	NORTHING		
SSM 17332	299 360.640	1 242 841.591	56	2
PM 25362	299 366.297	1 242 580.854	56	2
COMBINED SEA LEVEL SCALE FACTOR = 0.99994				
SOURCE I.S.G. CO-ORDINATES ADOPTED FROM NSW LANDS DEPT AT 12 AUGUST 1997				

SCHEDULE OF SHORT BOUNDARIES		
No.	BEARING	DISTANCE
1	91° 54'	2.04
2	9° 48'	12.365
3	12° 20'	11.125
4	13° 22'	9.42



DP 874035 (E)

Registered: 12.1.1998

C.A.: No F82/97 OF 27.10.1997

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: U 9137-34*

Last Plan: DP 774309 DP 832619

PLAN OF SUBDIVISION OF LOT 164 IN DP 774309 AND LOT 10 IN DP 832619

Lengths are in metres. Reduction Ratio 1: 1:2000

LGA BANKSTOWN

Locality: MILPERRA

Parish: BANKSTOWN

County: CUMBERLAND

This is sheet 1 of my plan in 1 sheets

I, PATRICK KENNETH HANNE of WHELAND AUSTRALIA 10 VICTORIA RD PARRAMATTA (P.O. BOX 3) PARRAMATTA a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1990 and was completed on the 15. SEPTEMBER 1997

SURVEY OF LOT 103 ONLY

(Signature) .....

Surveyor registered under the Surveyors Act 1929.

Datum Line of Survey: 'A' – 'B'

If insert Line of Survey

Plans used in preparation of survey/compilation

DP 18010
DP 732013
DP 774309
DP 824007
DP 832519
DP 847398

PANEL FOR USE ONLY for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements restrictions on the use of land or positive covenants

SURVEYOR'S REFERENCE: 7384 – D.P 1 – COMP 97/657 – "CHECKLIST" 98/003 CLAUSE 30(3)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

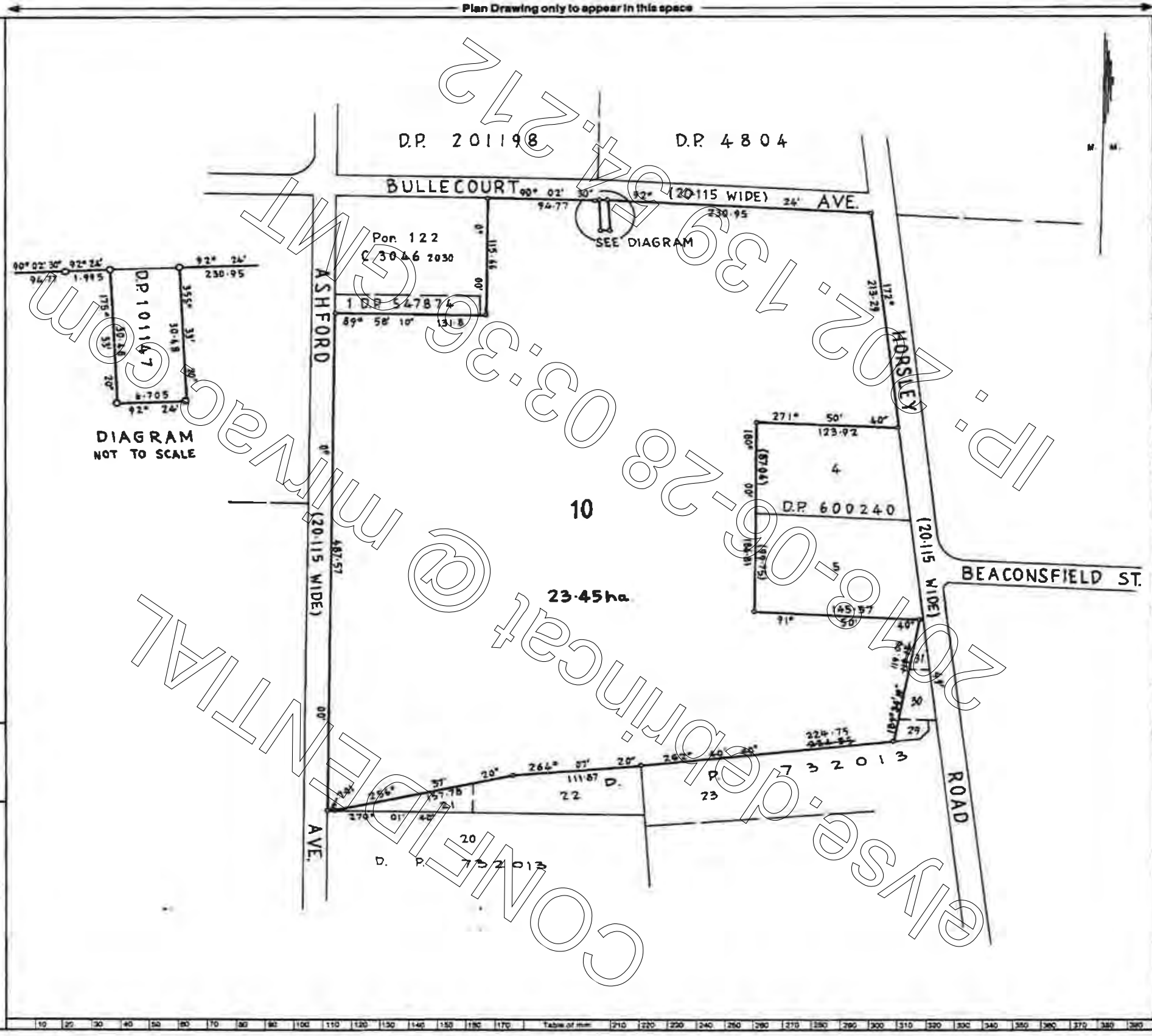
DP 874035

P: 2021 139 CMT 28-06-2018 03:39 PM
CONFIDENTIAL Geotechnical & Environmental

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf
Req:R203359 /Doc:DP 0832619 P /Rev:20-Aug-1993 /Sts:OK.OK /Pgs:ALL /Prt:16-Aug-2017 15:14 /Seq:1 of 1
Ref:Milperra /Src:M

PLAN FORM 2 — Plan Drawing only to appear in this space — *OFFICE USE ONLY

SIGNATURE AND SEALS ONLY



DP 832619

Registered: 18 8 1993

C A

Title System: TORRENS, OLD SYSTEM & CROWN LAND

Purpose: ACQUISITION - (NOT A CURRENT PLAN AT REGN SEE 5.327 AA L.G. ACT)

Ref Map: U 9137 - 34

Last Plan: DP 632999, DP 732013

PLAN OF PART OF LOT 1, D.P. 632999 AND LOTS 12-15 (INCL.) D.P. 732013.

Lengths are in metres. Reduction Ratio 1: 2500

Municipality / Shire: BANKSTOWN

Locality: MILPERRA

Parish: BANKSTOWN

County: CUMBERLAND

(Delete if inapplicable)

a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made in accordance with the Survey Practice Regulation 1990 and any special requirements of the Department of Lands, and was completed on

Signature: Surveyor registered under Surveyors Act, 1929, as amended.

Datum Line of Azimuth:

Date of Survey:

Plans used in preparation of survey/compilation.

D. P. 632999

D. P. 732013

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants

LOT 10 TO BE ACQUIRED

S.B. 51730

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages

Council Clerk's Certificate

I hereby certify that —

(a) the requirements of the Local Government Act 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of section 346 of the † Metropolitan Water, Sewerage and Drainage Act, 1924, as amended, † Hunter District Water, Sewerage, and Drainage Act, 1938, as amended

have been complied with by the applicant in relation to the proposed ..... (Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No .....

Date .....

(Signature) ..... Council Clerk

Council File No .....

*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water, Sewerage and Drainage Board and the Hunter District Water Board.

† Delete if inapplicable

SURVEYOR'S REFERENCE:

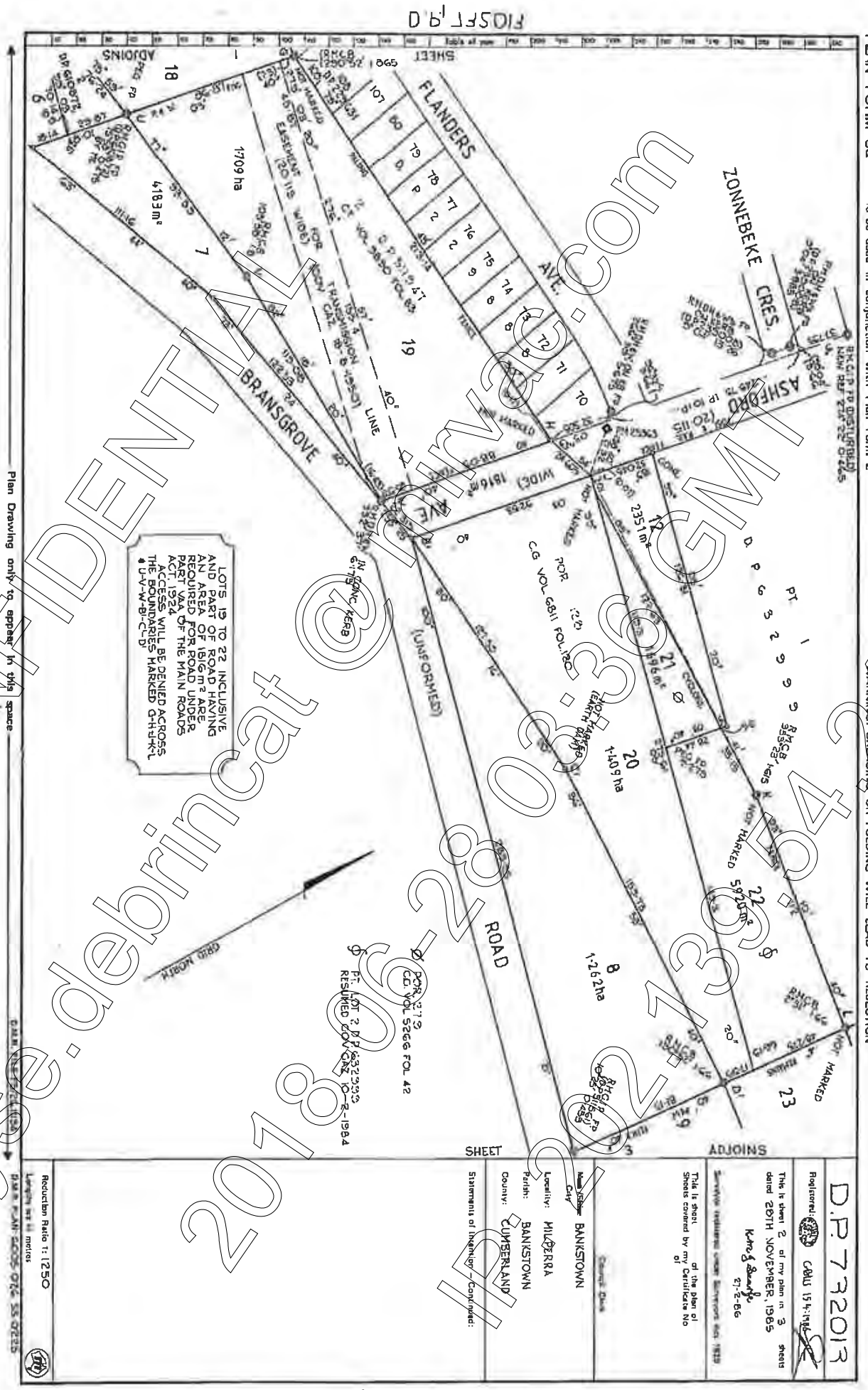
WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

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Req:R207433 /Doc:DP 0732013 P /Rev:13-Jan-1993 /Sts:OK.OK /Pgs:ALL /Prt:17-Aug-2017 10:53 /Seq:2 of 3
Ref:Milperra /Src:M

PLAN FORM 3a To be used in conjunction with Plan Form 2 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION



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2018-06-28 03:36 GMT
2021-30-04 12

PLAN FORM 2 — Plan Drawing only to appear in this space — * OFFICE USE ONLY

Signatures and seals only

D AGRAM 'A'
NOT TO SCALE

D.P. 201198

D.P. 4804

BULLECOURT (20·115 WIDE) AVE

SEE DIAGRAM 'B'

Por. 122
C 3046 2030

1 D.P. 547874

DP 101147

DIAGRAM 'B'
NOT TO SCALE

ASHFORD AVE

HORSLEY ROAD

4

DP 800240

1
23·65 ha

20·115 WIDE

BEACONSFIELD ST.

SEE DIAGRAM 'C'

DIAGRAM 'C'
NOT TO SCALE

7608m²

2

2 DP 511561

SEE DIAGRAM 'A'

Por. 128
C.3046-2030

Council Clerk's Certificate

I hereby certify that —

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of section 268 of the Metropolitan Water, Sewerage and Drainage Act, 1924, as amended, the Hunter District Water, Sewerage and Drainage Act, 1938, as amended

have been complied with by the applicant in relation to the proposed

(Insert "new road", "subdivision" or "consolidated lot") set out hereon

Subdivision No.

Date

(Signature) Council Clerk

*This part of certificate is to be deleted where the application is only for a consolidated lot or the opening of a new road or widening the road to be subdivided is wholly outside the area of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.

†Delete if inapplicable.

M. P. D

D. P. 632999

Registered: 11-7-1983

C.A.

Title System: TORRENS CROWN LAND & OLD SYSTEM

Purpose: ACQUISITION

Ref Map: U 9137 - 34*

Last Plan: D.P.s 4804, 348668, 511561, 547874 & 600240

PLAN OF SUBDIVISION OF LOTS 1 & 3 Ms. 22783 Sy R.

Reduction Ratio 1 : 1500
Lengths are in metres

Local Government Area / City: BANKSTOWN
Locality: MILPERRA
Parish: BANKSTOWN
County: CUMBERLAND

(Delete if inapplicable)

I, KENNETH JOHN QUARMBY
DEPT. OF PUBLIC WORKS, SYDNEY
a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that this diagram is accurate, has been prepared from OF COMPILATION and was completed on: 27th MAY, 1983

Signature: [signature] 27.5.83

Surveyor registered under the Surveyors Act, 1929, as amended
Delete Diagram if inapplicable
*Delete 2nd, 3rd or 4th if not more than 3 sheets of survey

Parcel/s for use only for statements of intention to dedicate public roads or to create public reserves drainage reserves easements or restrictions as to user

LOTS 1 & 2 PROPOSED TO BE ACQUIRED.

SURVEYOR'S REFERENCE S B 30047

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

I, Bruce Richard Davies, Under Secretary for Lands and Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this day.

12th July, 1983

S.B. 30047 D 6 pages

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf
Req:R222754 /Doc:DP 0632999 P /Rev:11-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:21-Aug-2017 10:59 /Seq:1 of 1
Ref:Milperra /Src:M
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01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

Req:R222449 /Doc:DP 0101147 P /Rev:22-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:21-Aug-2017 10:38 /Seq:1 of 1
Ref:Milperra /Src:M

ADDITIONS AND/OR ALTERATIONS NOTED ON PLAN TO REGISTERED GENERAL'S COPIES.

I, Bruce Richard Doyle, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 6th day of August, 1980

CONVERSION TABLE AGREED IN DEPARTMENT OF LANDS

DP 101147.

FEET	INCHES	METRES
-	1 1/2	0-038
-	5 1/4	0.133
-	6	0.152
-	7	0.178
-	10	0.254
1	-	0.305
22	-	6.705
66	1	20.167
66	5	20.193
67	1	20.422
67	2 3/4	20.472
82	3/4	25.190
100	-	30.480
164	9	50.063
230	9	70.307
317	5	96.698
330	5	100.584
432	1/4	131.807
758	1/2	231.229
758	3/4	231.235

AC	RD	P	SQ M
1	0	0	4047
0	0	1	232.3

PLAN of part of Lot 258 as shown on D.P. 4804 formerly Crown Reserve No. 4002, Pool 5th Extension and Lot 1 in D.P. 101147 Parish of Bankstown, County of Cumberland. Scale 1 inch = 100 feet

Misc. Plan (Subdn.) (R.P.) No. 3456

RE-PLAN OF PART OF BANKSTOWN ESTATE

ASHFORD AVE.

HORSLEY ROAD

Lot 1 D.P. 101147

Lot 258

Lot 1 D.P. 4804

Formerly Crown Reserve

Cancelled by Gazette

C.R. 1832 of 1880

Cancelled by Gazette

Formerly Crown Reserve

C.R. 1832 of 1880

Fr. O.R. Post in Fence.

330'0"

90°00' 90°00'

101.52

100'0"

175° 23'40"

355° 23'40"

100'0"

This is the plan marked "A" referred to in the annexed Declaration of Passage from Alice Blanche Smith to the Council of the Municipality of Bankstown dated 29th February 1936

Alice B. Smith

Mayor

Town Clerk.

This plan approved by the Council of the Municipality of Bankstown for purposes referred to in the annexed Declaration dated the 29th day of June 1936 and made pursuant to the provisions of Section 342 of the Local Government Act 1919 as amended by subsequent Acts.

CONFIDENTIAL elizabeth@mirvac.com 02 8003 3636 @MT 02 8003 5421

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

Req:R204115 /Doc:DP 0004804 P /Rev:23-Jul-1992 /Sts:OK.OK /Pgs:ALL /Prt:16-Aug-2017 16:06 /Seq:1 of 2
Ref:Milperra /Src:M

1

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 4804 CONTINUED

LINKS	METRES
1109.1	223.12
1109.3	223.16
1127.2	226.76
1127.7	226.86
1133.5	228.02
1147.6	230.86
1151	231.54
1154	232.15
1161.6	233.68
1165.1	234.38
1168.4	235.04
1174.8	236.33
1175.6	236.49
1179.7	237.32
1189.7	239.33
1190.1	239.41
1203.4	242.09
1203.7	242.15
1215.2	244.46
1217.7	244.96
1227.3	246.89
1231.8	247.8
1245.8	250.62
1251.2	251.7
1259.9	253.45
1271.1	255.7
1274	256.29
1275	256.49
1282.5	258
1288	259.1
1299	261.32
1302.1	261.94
1305	262.52
1322.8	266.1
1323.2	266.19
1336	268.76
1346.5	270.87
1351.4	271.86
1357	275
1398	281.23
1437.3	289.14
1478	297.33
51175.6	10299.9
91231.8	18352.9

AC	RD	P	HA
9	1	36	1.811
13	1	8	2.623
14	1	37 1/2	2.844
15	1	1	2.118
15	1	22	2.124
15	1	26 1/2	2.18
15	1	32 3/4	2.192
15	1	35 1/2	2.2
15	2	1	2.214
15	2	3 3/4	2.228
15	2	16	2.235
15	2	21	2.266
15	2	28	2.279
15	2	36	2.296
15	2	39	2.317
15	3	-	2.324
15	3	10	2.327
15	3	17	2.332
15	3	22	2.37
15	3	23	2.382
15	3	33	2.385
16	1	-	2.41
16	1	.05	2.428
16	1	2	2.428
16	1	4	2.433
16	1	8	2.438
16	1	16	2.441
16	1	20	2.468

5/-15-5 C.

M.D BANKSTOWN

4804 G

PLAN

showing subdivision of the

WESTON ESTATE

Parish of Bankstown *County of Cumberland*

Scale 8 chs to an inch

BEACONSFIELD ESTATE

GEORGE'S HALL PARK ESTATE

BRANSGROVE ROAD

DIAGRAM N°1 (not to Scale)

WORSLEY ROAD

Diagram N°2

RIVER

I, Bruce Richard Doyles, Registrar General for New South Wales, certify that this is a photograph made as a permanent record of a document in my custody this 5th day of September, 1979

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2018-09-28 03:39 GMT
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Req:R204115 /Doc:DP 0004804 P /Rev:23-Jul-1992 /Sts:OK.OK /Pgs:ALL /Prt:16-Aug-2017 16:06 /Seq:2 of 2
Ref:Milperra /Src:M

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

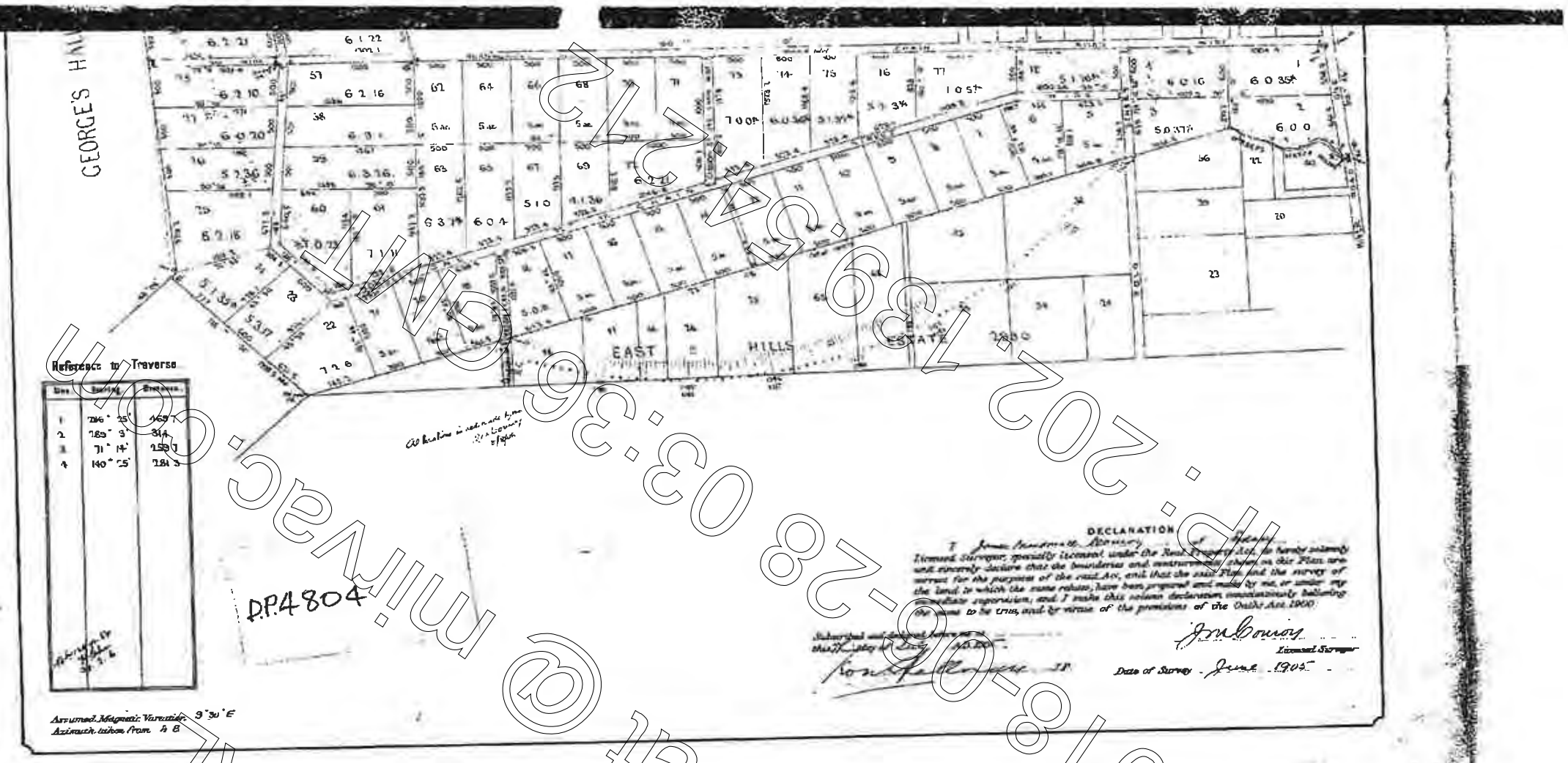
CONFIDENTIAL
Please-deliver@hotmail.com
Ph: 0290 1899 - 0280 0336

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 4804

LINKS	METRES
5	1.005
32.31	7.91
82	16.495
85	17.1
100	20.115
101.1	20.34
103.8	20.88
134.3	27.015
160	32.185
178	35.81
186	37.415
198.5	39.93
259.7	52.24
281.3	56.59
304.4	61.24
314	63.17
361.5	72.72
366.5	73.73
378.7	74.97
398.1	77.46
409.6	82.2
459	91.53
465.7	93.66
500	100.58
501	100.79
502	100.99
508.7	102.33
523.4	105.29
523.5	105.31
598.6	120.42
600	120.7
621.5	125.05
623.5	125.45
626.1	126.35
638.5	129.45
640.3	128.81
643.5	129.45
648.8	130.12
658.7	132.31
661.4	133.05
676	135.99
677.3	136.25
698	140.42
720	140.82
706.7	142.17
719.2	144.68
732.6	147.42
742.2	149.31
777	156.31
798.9	160.71
816.2	164.6
820	166.57
828.1	180.67
910.7	184.21
918.8	184.88
937.3	188.59
972	195.74
976.1	196.56
979.2	196.98
1000	201.17
1004.4	202.03
1007.9	202.74
1011.2	203.42
1013.6	203.9
1025.3	206.26
1025.6	206.32
1034.3	208.07
1037.8	208.77
1046.8	210.58
1051.1	211.45
1059.6	213.16
1070	215.25
1075.9	216.44
1079.7	217.2
1087.6	218.79
1090.66	219.41
1103.4	221.97

2



DECLARATION

I [illegible] Attorney of [illegible]
Licensed Surveyor specially licensed under the Real Property Act, do hereby solemnly and sincerely declare that the boundaries and measurements shown on this Plan are correct for the purposes of the said Act, and that the said Plan and the survey of the land to which the same relates, have been prepared and made by me, or under my immediate supervision, and I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act 1900.

[illegible]
Licensed Surveyor

Subscribed and declared before me at [illegible]
this [illegible] day of [illegible] 19[illegible]

Date of Survey - June 1905

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 4804 CONTINUED

AC	RD	P	HA
6	-	21	2.481
6	-	27	2.496
6	-	35 1/2	2.518
6	-	36 1/2	2.52
6	-	38	2.524
6	-	39	2.527
6	1	1	2.532
6	1	9	2.552
6	1	10	2.554
6	1	20	2.58
6	1	22	2.585
6	1	39	2.628
6	2	10	2.656
6	2	16	2.673
6	2	21	2.684
6	3	1	2.734
6	3	2.6	2.738
6	3	7 3/4	2.753
6	3	26	2.797
7	-	1/2	2.834
7	-	5 1/2	2.847
7	-	25	2.891
7	1	11	2.965
7	2	6	3.05
8	-	6	3.253
8	2	18	3.485

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 6th day of September, 1979

[illegible]

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf
Req:R216869 /Doc:CP 02562-2030 P /Rev:17-Nov-2012 /Sts:OK.OK /Prt:17-Aug-2017 10:06 /Seq:1 of 1
Ref:Milperra /Src:M

A.293

Cancels part Plan C.3046 2030

Subdivision

Papers C.S.& R.S.S. 3628-20

Within Liverpool Population Area Proc'd 25.3.33
Within Bankstown Sett. Pur Area Proc'd 9.11.23

PLAN OF PORTIONS 279 & 127 (as amended,)

Parish of Bankstown County of Cumberland

LAND DISTRICT OF ~~PARRAMATTA~~ Metropolitan LAND BOARD DISTRICT OF SYDNEY

BANKSTOWN MUNICIPALITY

Por.ⁿ 127 William John Pope Sett Pur.ᵈ 31.~~4~~.43
Por.ⁿ 279 p.ᵗ Sett Pur 31.~~4~~.43

① Por. 279 sold under Sec.ⁿ 22 Cl. Sett. (Amend.ᵗ) Act. 1909 to George Williamson Sale completed C.S.R.S.S. 40-3628/29
Por. 127 purchased for Milperra Public School on 28.5.56. Pks. 56-3191
Por. 279 " " " " " " 1.4.57 Pks. 57-2650

125 (3046.2030 R.J.) H.A. Amos A.T.P. 6.1.17

113 (3044.2030 R.J.) B.J. Bryant T.P. 5ac.

126 (3046.2030 R.J.) J.J. Tracey A.T.P. 6.2.8

114 (3044.2030 R.J.) Forfeited 20.12.35 5ac

127 1329.3 p.c. 90° 00' 340.7 (100 wide) AVENUE 660.0 F.P. 175' 33' 40' 330.5 p.c. 1329.3 p.c. 90° 00' 1329.3 p.c. 5.2.39 by ded.ⁿ 740.65 by ded.ⁿ 270.0 (88) TRACK 270.0 30.0 628.1 1ac 628.1 279 ① 30.0 A B 660.0 wire fence sone netting

115 (3044.2030 R.J.) F.G. Sykes T.P. 7.2.32

128 (3046.2030 R.J.) H. A. Hambly T.P. 6.2.16

Intersection of fences reg.ᵈ trees & P.M. 40 E.S.

ASHFORD

BRANSGROVE (100 wide) ROAD

X Y

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

Azimuth taken from X.Y.

Field Book L.D.1024 Pages 33

Reference to Corners

Corner	Bearing	From	Links	Nature of Trees
A	270° 0'	G.I. Pipe	5.0	
B	90° 0'	G.I. Pipe	5.0	

5562.2030

Reference to Traverse

Line	Bearing	Distance

Cal. Book No. Folio 4

Improvements

[redacted] Fronting

[redacted]

I Percy Elston Raymond of Epping a Surveyor registered under the Surveyors Act, 1929 do hereby solemnly and sincerely declare that the survey represented in this plan has been made by me in accordance with the Survey Practice Regulations 1933 and the special requirements of the Department of Lands was completed on the 19th February 1940, and the ~~permanent~~ reference * marks have been placed as shown hereon.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

P.E. Raymond

Surveyor registered under the Surveyors Act 1929.

Subscribed and declared before me at Parramatta this Fifteenth day of March 1940

Justice of the Peace.

* Strike out when not required.

Transmitted to the District Surveyor with my letter of 15th March 1940

Checked and Charted 12.4.40

Examined P.A. Debelle 12-4-40

Plan approved Officer in charge 15th April 1940

Scale ~~20~~ Chains to an Inch.

Lithographed & Printed at the Department of Lands Sydney N.S.W. 33 1168

pos 3887

Cat No. C 5562.2030

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analyse.debelle@minvac.com
18-06-2018 03:36:36 GMT
202.139.54.212
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01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf
Req:R204116 /Doc:CP 03142-2030 P /Rev:27-Nov-2012 /Sts:OK.OK /Prt:16-Aug-2017 16:06 /Seq:1 of 1
Ref:Milperra /Src:M

Subdivision Survey

Papers A.S.S. 18 6750

PLAN OF PORTION 258

County of Cumberland Parish of Bankstown

Land District ~~Parramatta~~ Metropolitan Land Board District Sydney Eastern Division

RESUMED AREA No PASTORAL HOLDING

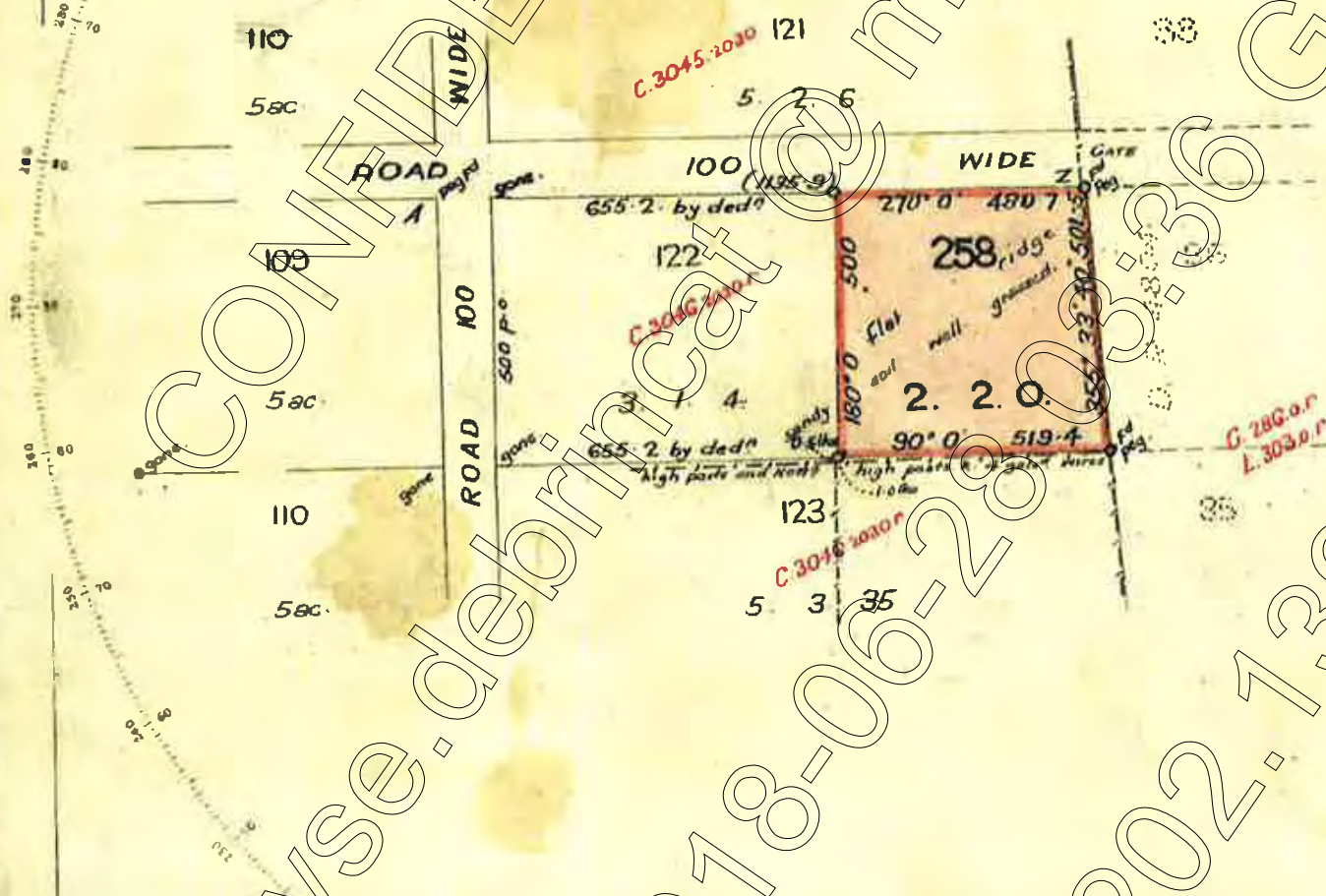
Applied for under the Section of the Crown Lands Consolidation Act of 1913 by

to be dedicated for Public School Purposes at Milperra

Part of land in Cert of Title Vol. 706. Fol. 35 ~~required~~ purchased 11.4.17 (George's Hall (Bankstown Estate)) for Returned Soldiers Settlement under Sec. 197 C.L.C Act. 1913. vide M^n 4/2036

Dedicated for Public School ~~Purposes~~ 19th July 1918.

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE



Cancels part of C.3046 2030

Azimuth taken from A.Z.

Field Book 9455 Page 27.

Reference to Corners

Corner	Bearing	From	Links	Nº on Tree
Numbered pegs at Corners				

3142.2030

Improvements

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 17th April 1918 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

L. J. Ambrum

Licensed Surveyor (Staff)

Forwarded to the District Surveyor with my Letter of 19th April 1918 Nº 20

Voucher Nº Passed
Calculation Book Nº Folio
Checked and Charted C.E.Spencer, 6.5.18.
Examined and Plan approved C Edwards

Draftsman in Charge
7th May 1918

Scale 4 Chains to an Inch.

Lithographed and Printed at the Department of Lands, Sydney, N.S.W. 1918

Nº of Lith. 17-6880

Cat Nº C. 3142.2030

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dlyse.debrincat@mirvac.com
2018-06-28 03:36 GMT
IP: 202.139.54.212

01.06 Preliminary Site Investigation > 01.06.01 R001 (Bankstown Campus Phase 1) Rev 1.pdf

Req:R204007 /Doc:CP 03046-2030 P /Rev:27-Oct-2014 /Sts:OK.OK /Prt:16-Aug-2017 15:59 /Seq:1 of 1
Ref:Milperra /Src:M

Municipality of Bankstown
Within Population Area of Liverpool - Proclaimed 25th March 1899

Papers R.S.S. 17-4131
At Milperra
Sh 3
Ref Sh 5

PLAN OF PORTIONS 122 to 128

County of Cumberland Parish of Bankstown

LAND DISTRICT OF ~~Parramatta~~ LAND BOARD DISTRICT OF Sydney
Resumed Area No Pastoral Holding, Eastern Division

Applied for under the Section of the Crown Lands Act of by

being subdivision of part of land included in R.P. App.ⁿ 4904 C. of T. Vol 906 Fol 35

Pors 123 to 128 Within Soldiers Group Purchase Area No 4 (Bankstown) Notified 8th April 1921 Por 124-128 Rev 3-11-25 Por 126 Rev 7 Mar 1924

Por 123 S.G.P. No 21-18 Henry William Rickel Gor 22nd July
124 S.G.P. No 21-19 William James Holmes
125 S.G.P. No 21-20 Richard John Gerlick
126 S.G.P. No 21-21 Ernest Henry Williams
127 S.G.P. No 21-22 Edward Ernest Griffiths

Forfeited and Resumed from Sale & Lease Vide Gazette 12 23 Res Rev 3-11-28
Forfeited and Resumed from Sale & Lease Vide Gazette 17 6 23 Res Rev 3-11-28

123·124·125·127·128 Pt Bankstown Set Pur Area Notified 8th Mar 1923
124·128 Set apart as farms Within Bankstown Set Pur Area Notified 9th Nov 1923
Por 124 - William Austin Richie Sett Pur 25 Dec

Por 125 Sett Pur 25 Dec William Austin Richie
Por 127 - Sett Pur 24-44 - Jan 15th Frederick Brown
Por 128 Addition to Bankstown Settlement Purchase Area Notified 7 March 1924
Por 126 Set Apart as Farm Within Bankstown Settlement Purchase Area 7 March 1924
Por 123 S.P. 24-45 Charles Masheman
Por 125 S.P. 24-46 Walter Glynn
Por 124 - SP 24-47 August 1st Hugh Macdonald
Por 124 - SP 24-48 August 5th Charles Stephen
Por 126 - SP 24-56 Sept 3rd Gordon Maples
Por 126 - SP 24-57 Sept 8th Henry Cameron
Por 126 - SP 24-58 Sept 8th Walter

Por 126 Sett Pur 24-60 James Augustus
Por 128 Sett Pur 24-66 of 1/10 Nov Henry George
Por 126 Sett Pur 25-10 of 6.3rd William Henry Barnes.
Por 126 Sett Pur 25-7 of 23rd
Por 126 Sett Pur 25-9 of 2nd May William Hall Refused 10-4-26.
Por 128 Sett Pur 25-14 of 3rd May Percy Douglas Arthur Manning Washer.
Pt Por 122 R.G.2067A Sale or Lease gently for Public Recreation Not 16th Feb 1929
Pt Por 122 within R.G.2067A From Sale or lease gently for Public Recreation Notified 7.2.31
Pors 126 & 127 Declared available for application Gaz 14-8-31
Por 128 Sett Pur 31 Edward Victor Burt Forfeited Gaz. 29.1.37
Por 127 Sett Pur 31 William John Pope
Por 128 Sold to Thomas Henry Hornby (Ken Pur) Nov 27th 1933
Por 126 Sold to Ernest Stanley Stratton as Tenderer Purchaser 13.6.34
Annulled Gaz 7.7.33
Por 126 Sold to John Joseph Treacy and others Gaz 3rd Oct 1934
Por 126 Sold to Ernest Stanley Stratton on 7th May 1936 as Tenderer Purchaser
Por 128 Sold to Kingsley John Scharlo on 11th December 1936
(1) Por 125 now John Joseph O'Brien Sale completed 5-5-37 No 2938
(2) Por 125 now Bank of New South Wales Sale completed 5-10-37 No 2938
(3) Por 128 Kingsley John Scharlo Sale completed Ten 54-9020
(4) Por 123 Tender Purchase Commonwealth Trading Bank of Australia Sale completed Ten 54-9020
Por 124 purchased for Milperra Public School 1.3040:56
(5) Por 125 purchased for Milperra Public School on 9.12.53
(6) Por 126 do do do 3.8.54

Por 122 Sett Pur 24-44 of 15th Nov Frederick Brown Forfeited Gaz 3.7.31

Azimuth taken from Por 155
Field Book Vol 8595 Folios 8 to 20
Partly cancels Plan C.186 old roll

Reference to Corners

Corner	Bearing	From	Links	To Corner
A	190° 16'	Vertical	2.97	128
B	102° 46'	Mutiny	2.46	122

Reference to Traverse

Line	Bearing	Distance

Improvements Fencing - No value on Pors 125 to 128
Por: 122 ½ fencing E/S
125 " " P/S
124 " " B/L

108 121 C 3045 2030 38
ROAD 100 WIDE
109 122 5 3 4 258 Road 36
110 123 1174·6 5 3 35 1213·5 35
111 124 6 0 26 1252·3
112 125 6 1 17 1251·1
113 126 6 2 8 1232·9 32
114 127 5 2 39 6 2 35 1358·75 31
115 128 6. 2. 16 1497 f
7 2. 32 110·88
ROAD 100 WIDE Bransgrove Rd
Oak 154 Scrub Bottle Edge Rails Fence

Cancelled by C 5562 2030

— Permanent Mark —
from A 180° 0' 51 lks bolts

PLAN MICROFILMED
EDITIONS OR AMENDMENTS TO BE MADE

Plan approved for Por 127 of 3a 2r 4p
Draftsman in Charge 15th Sept 1920

I hereby certify that I in person made and on the 16th May 1917 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands

S. F. Abraham Licensed Surveyor (Staff)
Transmitted to the District Surveyor with my letter of 16th June 1917 No 35

Voucher No Passed Staff
Calculation Book No Folio
Checked and Charged J.B. Waddington 25th July 1917
Examined and
Plan approved C. Edwards
Draftsman in Charge
26 July 1917

Plan Approved for Por 127 of 3ac 1r 4p
C. Edwards
Draftsman in Charge
15 May 1918

3046-2030

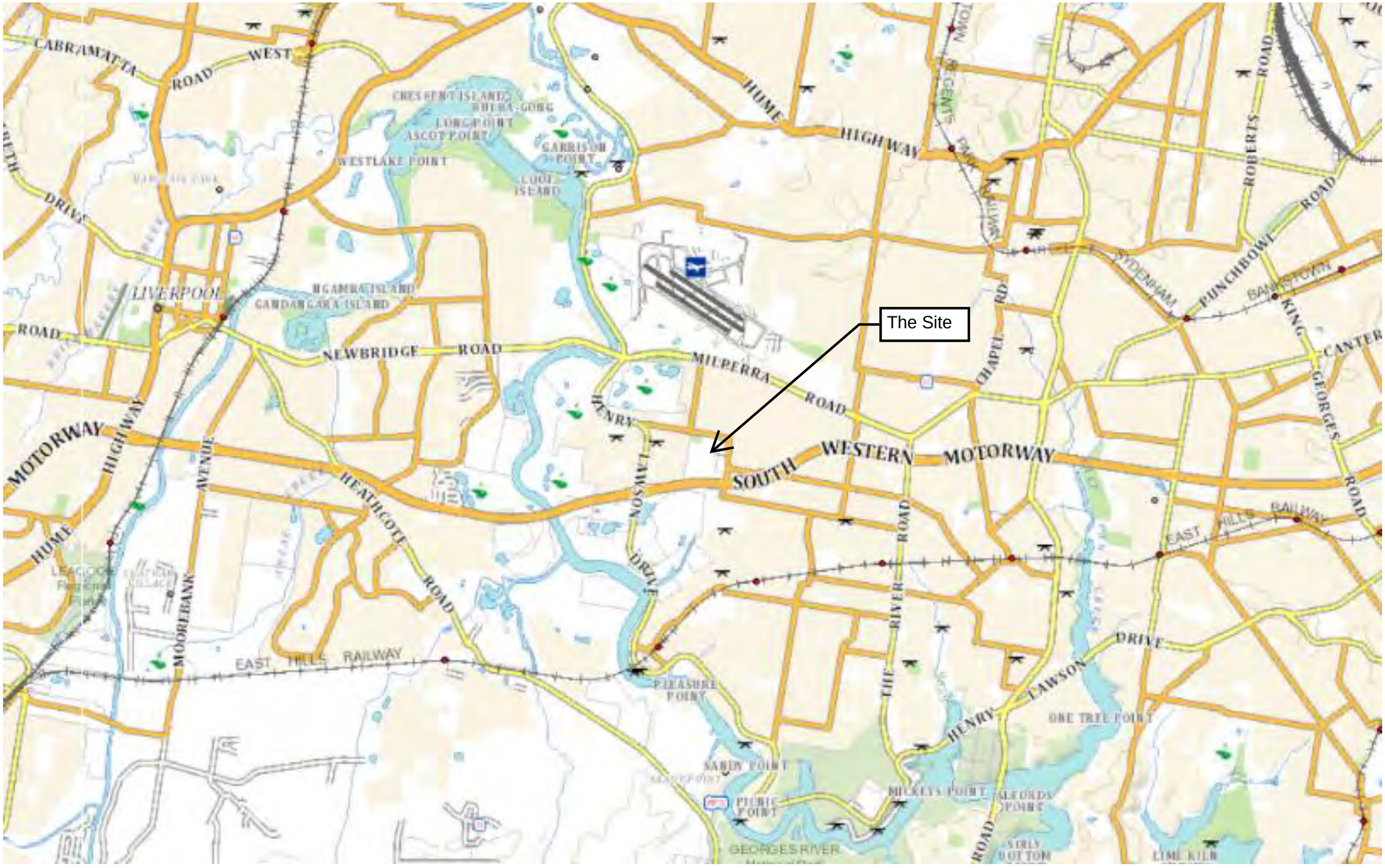
Scale 6 chains to an inch

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Clients.alyse.net.au 203.36.28.8 GMT IP: 202.139.54.212

Alliance Geotechnical (January 2020)

DSI



Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	Site Locality				
	Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	1
	Project Name:	Stage 2 Detailed Site Investigation		Figure Date:	10 December 2019
	Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-1-1



Scale: 100.00 m

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Site Layout Plan

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	2
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	10 December 2019
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1

N

BULLECOURT AVE
Bus Bay
Hockey Club
DP 91953
FIRST AVENUE
Student Residence
DP 547674
IAN SMITH AVENUE
P1
P5
Student Residence
ASHFORD AVE
THIRD AVENUE
P8
P2
HORSLEY RD
SINAI AVE
MERRIS PL
LILLE PL
MESSINES AVE
DERNANCOURT PDE
ZONNEBEKE AVE
Volleyball Court
P6
HAMEL CL
SOMME CR
Javelin, Hammer & Shot put fields
Storage Containers
Cricket Oval Football Field Running Track
Long Jump Fields
P3
IAN SMITH AVENUE
Mt St Joseph Catholic School
Covered Courts
Tennis Courts
P4
FLANDERS AVE
SOUTH WESTERN MOTORWAY
DP 1092293
DP 327986
DP 73
SP 64626
DP 221860
50
100
200

12d Project - c:\12dS\data\Affinity\Projects_5\02 - Royal Randwick Hospital - Diona\02.1 Controlled 12d Projects\SERVICES EXISTING.12dmodel\SERVICES EXISTING



THIS SHEET MAY BE PREPARED USING COLOUR AND MAY BE INCOMPLETE IF COPIED
DRAWING FILE LOCATION \ NAME
C:\Users\Affinity Survey\Desktop\Kevin O Gorman Personal\New Jobs Details\Milperra Western Sydney Campus\Western Sydney University Monitoring Wells111

A3 ORIGINAL 100 mm ON ORIGINAL
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

REV	DATE	NOTES	WVR No	APPROVAL

AFFINITY SURVEY

PLOT DATE
Mon Jan 20 17:49:09 2020

TITLE	NAME
DRAFTER	Affinity Survey
DRAFTING CHECK	
DESIGNER	
DESIGN CHECK	
DESIGN MANAGER	
PROJECT MANAGER	

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

CLIENT

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SCALE at A3 1:1000

N

CO-ORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: A.H.D.

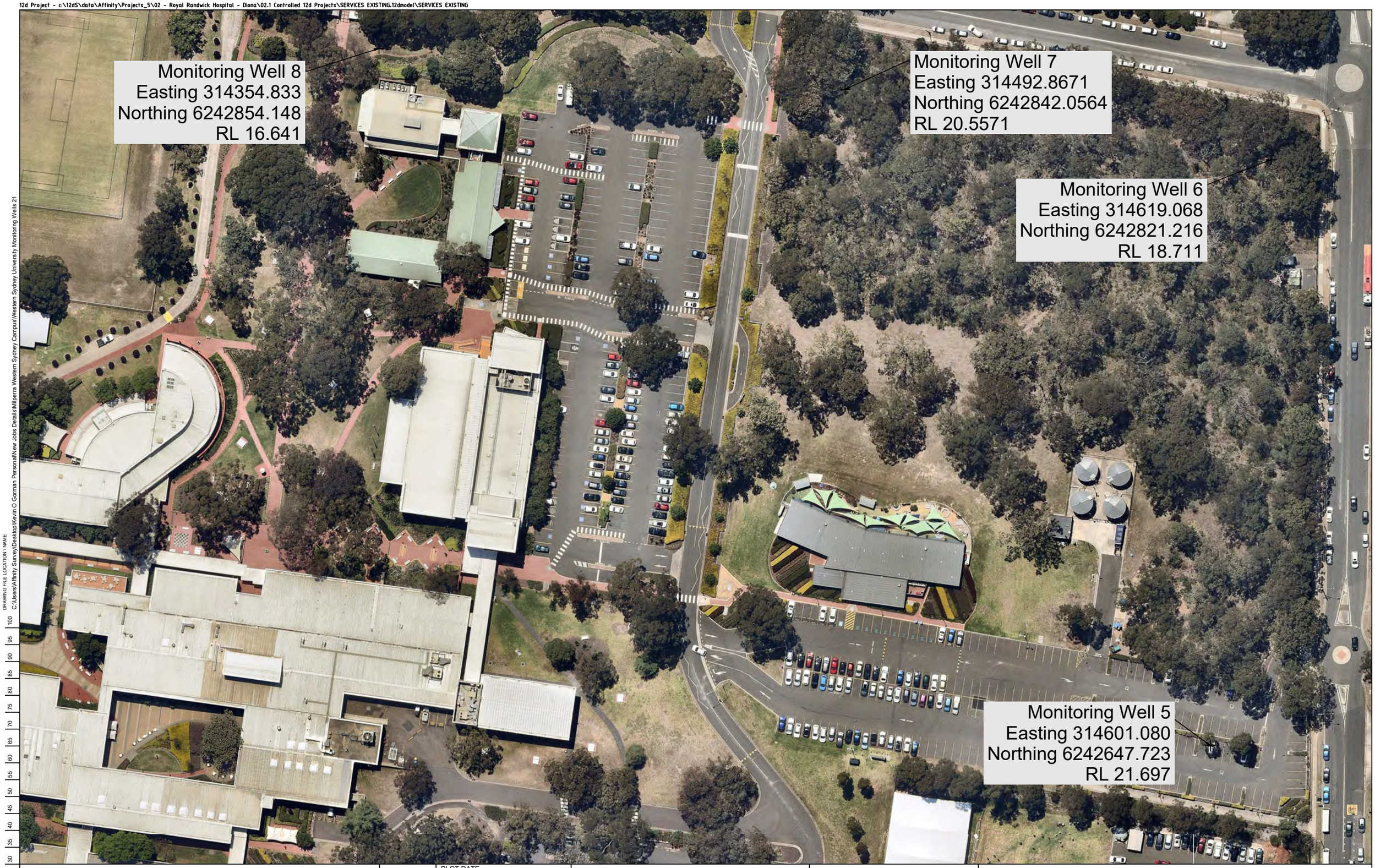
Western Sydney University Campus, Milperra

Location And Level Monitoring Wells

PLOT DATE = Mon Jan 20 17:49:09 2020

CLIENT PROJECT / DRAWING No	ISSUE STATUS	AS PROJECT / DRAWING No	ISSUE

12d Project - c:\12dS\data\Affinity\Projects_5\02 - Royal Randwick Hospital - Diona\02.1 Controlled 12d Projects\SERVICES EXISTING.12dmodel\SERVICES EXISTING



A3 ORIGINAL 100 mm ON ORIGINAL THIS SHEET MAY BE PREPARED USING COLOUR AND MAY BE INCOMPLETE IF COPIED
DRAWING FILE LOCATION \ NAME C:\Users\Affinity Survey\Desktop\Kevin O Gorman Personal\New Jobs Details\Milperra Western Sydney Campus\Western Sydney University Monitoring Wells 21

	REV	DATE	NOTES	WVR No	APPROVAL
AFFINITY SURVEY					

PLOT DATE
Mon Jan 20 18:03:18 2020

TITLE	NAME
DRAFTER	Affinity Survey
DRAFTING CHECK	
DESIGNER	
DESIGN CHECK	
DESIGN MANAGER	
PROJECT MANAGER	

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

CLIENT

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING

SCALE at A3 1:1000

N

CO-ORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: A.H.D.

Western Sydney University Campus, Milperra

Location And Level
Monitoring Wells

PLOT DATE - Mon Jan 20 18:03:18 2020

CLIENT PROJECT / DRAWING No	ISSUE STATUS	AS PROJECT / DRAWING No	ISSUE



Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	Areas of Environmental Concern			
Client Name:	Mirvac Homes NSW PTY Ltd	N	Figure Number:	3
Project Name:	Stage 2 Detailed Site Investigation		Figure Date:	10 December 2019
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW		Report Number:	9996-ER-1-1



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Sampling Point Layout Plan

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	4
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	10 December 2019
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1



Scale: 100.00 m

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Inferred Groundwater Flow Direction

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	5
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	30 January 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1



Legend

- Approximate Test Pit Locations (AG 2020)
- Approximate Borehole Locations (AG 2020)
- Approximate Sampling Point Locations (Coffey 2011)
- Approximate Sampling Point Locations (NAA 2011)
- Approximate Sampling Point Location (JBS&G 2018)

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Exceedances of Criteria

Client Name:	Mirvac Homes NSW PTY Ltd	Figure Number:	6
Project Name:	Stage 2 Detailed Site Investigation	Figure Date:	30 January 2020
Project Location:	Western Sydney University – Milperra Campus – 2 Bullecourt Avenue, Milperra NSW	Report Number:	9996-ER-1-1

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER.-1

| | | |

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER.1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
					HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space		
				HSL - A Residential (Low Density)	0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture	Residential A	
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	-	180	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	TP16-1.9-2.1	TP17-0.9-1.1	TP17-1.9-2.1	BH17_0.0-0.2	BH18_0.2-0.4	BH19_0.0-0.2	BH20_0.0-0.15	BH21_0.1-0.3	BH22_0.8-1.0	TP22-0.0-0.2	TP22-1.9-2.1	BH23_0.0-0.2	BH24-0.0-0.2	BH25_0.0-0.2	BH26_0.0-0.2	BH27-0.0-0.2	BH28_0.0-0.2	BH28_0.8-1.0	BH29_0.0-0.2	BH30_0.0-0.2	BH31_0.0-0.2	BH32_0.0-0.2	BH33_0.0-0.2	BH34_0.0-0.2	BH35_0.0-0.2	BH36_0.0-0.2	BH36_1.0-1.2	BH36_2.0-2.2	BH37_0.3-0.5	BH38_0.0-0.2	BH39-0.0-0.2
Reference	S20-Ja12906	S20-Ja12907	S20-Ja12908	S19-De29161	S19-De29162	S19-De29163	S19-De29164	S19-De29165	S19-De29166	S20-Ja12909	S20-Ja12910	S19-De29167	S20-Ja04478	S19-De29168	S19-De29169	S20-Ja04479	S19-De29170	S19-De29171	S19-De29172	S19-De29173	S19-De29174	S19-De29175	S19-De29176	S19-De29177	S19-De29178	S19-De29179	S19-De29180	S19-De29181	S19-De29182	S19-De29183	S20-Ja04480
Date Sampled	15/01/2020	15/01/2020	15/01/2020	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	15/01/2020	15/01/2020	16/12/2019	9/01/2020	16/12/2019	16/12/2019	9/01/2020	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	9/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Arsenic, As	4.8	3.5	2.9	16	6.6	10	5.2	15	6.6	10	11	< 2	4.4	2.1	3.6	6.8	2.9	4.3	19	15	4.8	6.3	14	12	11	10	13	12	8.3	2.7	7.2
Cadmium, Cd	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium, Cr	5	6.7	7.9	5.8	19	9.1	16	6.5	7.5	11	14	7.7	< 5	11	6.2	8.2	11	7.1	27	10	8.3	9.8	17	14	17	22	15	22	27	17	7.2	17
Copper, Cu	5	16	30	13	9.7	12	15	38	19	47	16	35	5.3	18	6.5	11	14	5.5	< 5	8.8	12	8.6	9.9	16	13	16	22	17	24	14	29	22
Lead, Pb	6	11	24	19	18	18	31	66	40	24	20	25	6.8	29	14	20	16	7.9	8.9	18	39	18	14	16	19	20	41	43	20	19	44	30
Mercury (inorganic)	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel, Ni	5	8	19	< 5	< 5	< 5	7.2	< 5	< 5	38	9.5	22	< 5	8.5	< 5	< 5	6.9	< 5	< 5	< 5	30	27	6.3	16	< 5	5.8	6.6	6.2	< 5	6.5	7.9
Zinc, Zn	6	36	100	18	36	72	72	160	56	180	52	100	19	75	32	61	44	27	6.1	40	30	27	16	67	42	43	84	51	23	38	120	97
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5
TRH C10-C36 Total	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C10-C14	< 50	< 50	< 50	< 50	< 50	290	< 50	66	144	< 50	< 50	< 50	< 50	168	65	63	< 50	< 50	< 50	58	< 50	57	< 50	< 50	< 50	106	< 50	< 50	< 50	< 50	112	< 50
TRH C15-C28	< 50	< 50	< 50	< 50	< 50	130	< 50	72	< 50	< 50	< 50	< 50	82	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH C29-C36	< 50	< 50	< 50	< 50	< 50	160	< 50	66	72	< 50	< 50	< 50	86	65	63	< 50	< 50	< 50	< 50	58	< 50	57	< 50	< 50	< 50	56	< 50	< 50	< 50	58	< 50
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 (F2)	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C16 (F2) - Naphthalene	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
TRH C10-C40 Total (F bands)	110	< 100	< 100	< 100	< 100	320	< 100	< 100	120	< 100	< 100	< 100	< 100	130	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
TRH >C16-C34 (F3)	110

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER.-1.1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space	Residential A	
					0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH40-0.0-0.2	BH41-0.0-0.2	BH42-0.0-0.2	BH43-0.0-0.2	BH44-0.0-0.2	BH45-0.0-0.2	BH45-0.2-0.4	BH46-0.0-0.2	BH47-0.0-0.2	BH48-0.0-0.2	BH48-0.5-0.7	BH49-0.0-0.2	BH50_0.2-0.4	BH51_0.2-0.4	BH52_0.2-0.4	TP53-0.0-0.2	TP53-1.7-1.9	BH54-0.0-0.2	TP55-0.0-0.2	TP55-0.8-1.0	TP56-0.0-0.2	TP56-0.9-1.1	TP56-1.8-2.0	BH57_0.2-0.4	BH58_0.2-0.4	BH59_0.0-0.05	BH60_0.0-0.2	BH61_0.15-0.3	BH62_0.0-0.15	BH63-0.0-0.2	BH64_0.0-0.1
Reference	S20-Ja04481	S20-Ja04482	S20-Ja04483	S20-Ja04484	S20-Ja04485	S20-Ja04486	S20-Ja04487	S20-Ja04488	S20-Ja04489	S20-Ja04490	S20-Ja04491	S20-Ja04492	S19-De29184	S19-De29185	S19-De29186	S20-Ja12911	S20-Ja12912	S20-Ja04493	S20-Ja12913	S20-Ja12914	S20-Ja12915	S20-Ja12916	S20-Ja12917	S19-De29188	S19-De29189	S19-De29190	S19-De29191	S19-De29192	S19-De29193	S20-Ja04494	S19-De29194
Date Sampled	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	9/01/2020	17/12/2019	17/12/2019	17/12/2019	15/01/2020	15/01/2020	9/01/2020	15/01/2020	15/01/2020	15/01/2020	15/01/2020	15/01/2020	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	9/01/2020	17/12/2019
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Arsenic, As	4.9	4.8	5.6	9	6.5	8.4	16	9.5	6.9	7.5	7.3	12	14	13	7.3	4.5	6.5	2.5	7.3	8	6	12	8.9	9.1	8.4	2.3	14	6	< 2	5.9	2.4
Cadmium, Cd	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium, Cr	16	13	13	18	40	17	27	12	11	16	16	51	27	30	13	9.3	13	6.8	15	9.4	13	24	25	16	29	8.7	19	17	< 5	16	7.4
Copper, Cu	31	21	21	20	20	11	8.4	15	15	17	9.6	21	32	25	20	11	14	11	8.4	15	19	20	24	41	24	6.1	21	17	15	7.3	23
Lead, Pb	35	26	17	24	23	18	20	18	18	26	17	20	17	14	16	14	22	8.4	13	25	18	27	27	27	22	13	8.7	15	15	13	23	21
Mercury (inorganic)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel, Ni	5.2	12	13	5.9	34	6.6	< 5	< 5	< 5	8.5	6.1	24	15	18	< 5	< 5	< 5	< 5	< 5	< 5	< 5	13	11	< 5	25	5.5	< 5	12	< 5	< 5	5.9
Zinc, Zn	110	72	51	68	76	40	62	65	36	39	25	39	27	22	11	39	28	39	35	49	30	45	34	23	29	19	16	28	50	26	96
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH C10-C36 Total	< 20	< 20	< 20	22	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	120	< 20	170					
TRH C10-C14	< 50	165	142	179	197	183	< 50	133	< 50	132	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	70	134	< 50	< 50	< 50	< 50	159	< 50	< 50	2240	< 50	1440
TRH C15-C28	< 50	67	62	77	98	83	< 50	68	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	71	< 50	< 50	< 50	< 50	85	< 50	< 50	1400	< 50	660
TRH C29-C36	< 50	98	80	99	100	< 50	65	< 50	< 50	80	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	70	63	< 50	< 50	< 50	720	< 50	610					
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 40	< 20	< 40					
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	< 1					
TRH >C10-C16 (F2)	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	210					
TRH >C10-C16 (F2) - Naphthalene	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	140	< 50	210					
TRH C10-C40 Total (F bands)	110	< 100	130	110	130	160	150	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	< 100	120	< 100	< 100	2550	< 100	1690
TRH >C16-C34 (F3)	110	< 100	130	110	130	160	150	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	110	< 100	< 100	< 100	< 100	120	< 100	< 100	1800	< 100	1000
TRH >C34-C

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
					HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space		
				HSL - A Residential (Low Density)	0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture	Residential A	
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	20	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	-	180	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH65_0.0-0.1	BH66_0.0-0.1	BH66_0.3-0.5	BH66_1.0-1.2	BH67_0.0-0.05	BH68_0.0-0.1	BH69_0.05-0.2	BH71_0.0-0.2	BH72_0.0-0.2	BH73_0.0-0.2	BH74_0.0-0.2	BH75_0.0-0.2	BH76_0.0-0.2	BH77_0.0-0.2	BH78_0.0-0.2	BH79_0.0-0.2	BH80_0.0-0.2	BH81_0.2-0.4	BH82_0.05-0.2	BH83_0.05-0.2	BH84_0.05-0.2	TP85-0.0-0.2	TP85-1.7-1.9	TP85-2.5-2.7	BH86_0.0-0.2	BH87_0.0-0.2	BH88_0.0-0.2	BH89_0.0-0.2	BH90-0.0-0.1	BH91-0.0-0.1
Sample Date	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019	18/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	16/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	17/12/2019	15/01/2020	15/01/2020	15/01/2020	18/12/2019	18/12/2019	18/12/2019	18/12/2019	8/01/2020	8/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Reference	S19-De29195	S19-De29196	S19-De29197	S19-De29198	S19-De29199	S19-De29200	S19-De29201	S19-De29202	S19-De29203	S19-De29204	S19-De29205	S19-De29206	S19-De29207	S19-De29208	S19-De29209	S19-De29210	S19-De29211	S19-De29212	S19-De29213	S19-De29214	S19-De29215	S20-Ja12918	S20-Ja12920	S20-Ja12921	S19-De29216	S19-De29217	S19-De29218	S19-De29219	S20-Ja40513	S20-Ja40515
Acenaphthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs, BaP TEQ <LOR=LOR	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(b&j)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(ah)anthracene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	< 0.5	< 0.5	0.6	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	< 0.5	< 0.5	1.2	2.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH C10-C36 Total	< 20	< 20	< 20	< 20	< 20	29	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	110	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	140	< 20	< 20	< 20	< 20	< 20
TRH C10-C14	280	208	143	< 50	359	600	< 50	320	140	< 50	110	231	280	230	730	530	320	421	< 50	< 50	104	< 50	< 50	< 50	1100	168	114	55	154	104
TRH C15-C28	110	78	82	< 50	120	290	< 50	140	< 50	< 50	81	120	100	290	190	110	91	< 50	< 50	53	< 50	< 50	< 50	< 50	420	69	51	< 50	69	50
TRH C29-C36	170	130	81	< 50	210	310	< 50	180	140	< 50	110	150	160	130	330	340	210	330	< 50	< 50	51	< 50	< 50	< 50	540	99	63	55	85	54
TRH C6-C9	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 (F2)	< 50	< 50	< 50	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	130	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	150	< 50	< 50	< 50	< 50	< 50	< 50
TRH >C10-C16 (F2) - Naphthalene	< 50	< 50	< 50	< 50	< 50	52	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	130	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	150	< 50	< 50	< 50	< 50	< 50	< 50
TRH C10-C40 Total (F bands)	360	260	120	< 100	380	712	< 100	310	110	< 100	130	300	250	200	800	640	380	480	< 100	< 100	< 100	< 100	< 100	< 100	1320	130	< 100	< 100	120	< 100	
TRH >C16-C34 (F3)	220	150	120	< 100	260	490	< 100	310	110	< 100	130	200	250	200	510	450	270	300	< 100	< 100	< 100	< 100	< 100	< 100	790	130	< 100	< 100	120	< 100	
TRH >C34-C40 (F4)	140	110	< 100	< 100	120	170	< 100	< 100	< 100	< 100	< 100	100	< 100	< 100	160	190	110	180	< 100	< 100	< 100	< 100	< 100	< 100	380	< 100	< 100	< 100	< 100	< 100	
TRH C6-C10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH C6-C10 minus BTEX (F1)	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Benzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
m/p-xylene	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
o-xylene	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Table LAR1
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214
Soil Results & Adopted Site Criteria
9996-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (CLAY)					Management Limits for TPH Fractions F1 F4 in soil (mg/Kg) - NEPC 2013	ESLs and EILs - NEPC 2013	Health Investigation Levels for Soil Contaminants - NEPM 2013	Data Set Minimum
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential				Soil Saturation Concentration (Csat)	Residential, Parkland and Public Open Space	Urban Residential and Public Open Space	Residential A	
					0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+		Fine Soil Texture	Fine Soil Texture		
Metals	Arsenic, As	mg/kg	2	-	-	-	-	-	-	-	100	100	2
	Cadmium, Cd	mg/kg	0.4	-	-	-	-	-	-	-	20	20	1
	Chromium, Cr	mg/kg	5.0	-	-	-	-	-	-	-	190	100	5
	Copper, Cu	mg/kg	5.0	-	-	-	-	-	-	-	150	6,000	5
	Lead, Pb	mg/kg	5	-	-	-	-	-	-	-	1100	300	6
	Mercury (inorganic)	mg/kg	0.10	-	-	-	-	-	-	-	-	40	0.1
	Nickel, Ni	mg/kg	5.0	-	-	-	-	-	-	-	30	400	5
	Zinc, Zn	mg/kg	5.0	-	-	-	-	-	-	-	320	7,400	6
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	0.7	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	3	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	-	-	-	-	-	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	-	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	-	-	-	-	-	-	-	-	300	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	-	-	-	-	-	-	-	-	22
	TRH C10-C14	mg/kg	20	-	-	-	-	-	-	-	-	-	55
	TRH C15-C28	mg/kg	50	-	-	-	-	-	-	-	-	-	50
	TRH C29-C36	mg/kg	50	-	-	-	-	-	-	-	-	-	51
	TRH C6-C9	mg/kg	20	-	-	-	-	-	-	-	-	-	< 20
	Naphthalene	mg/kg	0.5	1,400	5	NL	NL	NL	10	-	170	-	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	3,300	280	NL	NL	NL	560	1,000	120	-	52
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	-	-	-	-	-	-	-	-	52
	TRH C10-C40 Total (F bands)	mg/kg	100	-	-	-	-	-	-	-	-	-	110
	TRH >C16-C34 (F3)	mg/kg	100	4,500	-	-	-	-	-	3,500	1,300	-	110
	TRH >C34-C40 (F4)	mg/kg	100	6,300	-	-	-	-	-	10,000	5,600	-	100
	TRH C6-C10	mg/kg	20	4,400	-	-	-	-	-	-	-	-	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	50	90	150	290	850	800	180	-	< 20
BTEX	Benzene	mg/kg	0.1	100	0.7	1	2	3	430	-	65	-	< 0.1
	Ethylbenzene	mg/kg	0.1	4,500	NL	NL	NL	NL	68	-	125	-	< 0.1
	m/p-xylene	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	o-xylene	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1	14,000	480	NL	NL	NL	630	-	105	-	< 0.1
	Total Xylenes	mg/kg	0.3	12,000	110	310	NL	NL	330	-	45	-	< 0.3
OCP	4,4 - DDD	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDE	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	4,4 - DDT	mg/kg	0.05	-	-	-	-	-	-	-	180	-	< 0.05
	a - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	b - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Chlordanes (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	50	< 0.1
	d - BHC	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	-	-	-	-	-	-	-	-	240	< 0.05
	Dieldrin	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 1	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan 2	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Endrin Ketone	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	-	-	6	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	-	-	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	-	-	10	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	-	-	300	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	-	-	< 1
	Vic EPA IWRG 621 OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	-	-	-	-	-	-	-	-	270	0.00
OPP	Azinphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Bolstar	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorfenvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Chlorpyrifos	mg/kg	0.2	-	-	-	-	-	-	-	-	160	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Coumaphos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Demeton-O	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Demeton-S	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Diazinon	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dichlorvos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Dimethoate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Disulfoton	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	EPN	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethoprop	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ethyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenitrothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fensulfothion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Fenthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Malathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Merphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Methyl parathion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Mevinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Monocrotophos	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Naled	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Omethoate	mg/kg	2	-	-	-	-	-	-	-	-	-	< 2
	Phorate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pirimiphos-methyl	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Pyrazophos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Ronnel	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Terbufos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tetrachlorvinphos	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Tokuthion	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
	Trichloronate	mg/kg	0.2	-	-	-	-	-	-	-	-	-	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	-	-	< 0.5
	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	-	-	1	< 0.5
Halogenated Phenols	2,4,5-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4,6-Trichlorophenol	mg/kg	0.5									-	< 1
	2,4-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2,6-Dichlorophenol	mg/kg	1.0									-	< 0.5
	2-Chlorophenol	mg/kg	0.5									-	< 0.5
	4-Chloro-3-methylphenol	mg/kg	1.0									-	< 1
	Pentachlorophenol	mg/kg	1.0									100	< 1
	Tetrachlorophenols - Total	mg/kg	1.0									-	< 10
	Total Halogenated Phenol*	mg/kg	1.0									-	< 1
Non-Halogenated Phenols	2,4-Dimethylphenol	mg/kg	20.0									-	< 0.5
	2,4-Dinitrophenol	mg/kg	5.0									-	< 5
	2-Cyclohexyl-4,6-dinitrophenol	mg/kg	0.2									-	< 20
	2-Methyl-4,6-dinitrophenol	mg/kg	1.0									-	< 5
	2-Methylphenol (o-Cresol)	mg/kg	0.5									400	< 0.2
	2-Nitrophenol	mg/kg	5.0									-	< 1
	3&4-Methylphenol (m&p-Cresol)	mg/kg	0.4									400	< 0.4
	4-Nitrophenol	mg/kg	5.0									-	< 5
	Dinoseb	mg/kg	20.0									-	< 20
	Phenol	mg/kg	0.5									3000	< 0.5
	Total Non-Halogenated Phenol*	mg/kg	20.0									-	< 20

Sample ID	BH92_0.0-0.2	BH93_0.0-0.2	BH94_0.0-0.2	BH95-0.0-0.2	BH96-0.0-0.1	BH97_0.0-0.2	BH98-0.0-0.2	BH99-0.0-0.2	BH99-0.2-0.4	BH100_0.2-0.4	BH101_0.0-0.2	TP101-0.0-0.2	TP101-0.8-1.0	TP101-1.3-1.5	BH102-0.0-0.2
Reference	S19-De29220	S19-De29221	S19-De29446	S20-Ja04517	S20-Ja04519	S19-De29222	S20-Ja04495	S20-Ja04496	S20-Ja04497	S19-De29223	S19-De29224	S20-Ja12922	S20-Ja12923	S20-Ja12924	S20-Ja04498
Date Sampled	18/12/2029	18/12/2029	18/12/2029	8/01/2020	8/01/2020	18/12/2019	9/01/2020	9/01/2020	9/01/2020	17/12/2019	18/12/2019	15/01/2020	15/01/2020	15/01/2020	9/01/2020
Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	< 0.05	8.5	7.3	6.2	4.7	5	< 2	3.1	2.5	14	14	11	7.4	8.5	5.5
	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.5	< 0.4	< 0.4	< 0.4	< 0.4
	18	7.7	9.1	< 5	11	7.3	< 5	7.2	6.9	17	20	18	16	21	9.2
	10	13	14	7.4	9.6	14	8.8	16	< 5	16	23	20	19	11	10
	13	21	18	9.7	15	19	11	61	< 5	16	62	44	25	18	15
	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
	< 5	< 5	< 5	< 5	6	< 5	< 5	7.6	< 5	< 5	9.2	7.2	7.9	< 5	< 5
	15	40	38	26	50	71	41	67	5.7	8.6	140	120	45	5.6	35
	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Table LAR2
Bullecourt Road, Milperra, NSW
Groundwater Results Summary Table
9996-ER-1-1

	Sample ID	MW01	MW02	MW03	MW04	MW05	MW08
	Reference	S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471	S20-Ja04472	S20-Ja04473
	Date Sampled	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020
	Sample Matrix	Water	Water	Water	Water	Water	Water
	NEPM (2013) - Table 1A(4)	**ANZECC & ARMCANZ (2000)**					
	Groundwater HSL's for Vapour Intrusion (SAND) - HSL D Commercial/Industrial 2m - <4m	**Fresh Waters**	**Marine Waters**				
	(mg/L)	**(mg/L)**	**(mg/L)**				
Metals/Metalloids							
Arsenic, As (V)	-	**0.013**	**-**	0.001	< 0.001	< 0.001	0.013	0.004	0.001
Cadmium, Cd	-	**0.0002**	**0.0007**	0.0017	0.0003	0.0005	< 0.0002	0.013	0.016
Chromium, Cr	-	**-**	**0.0270**	< 0.001	0.001	0.002	0.003	0.015	0.003
Copper, Cu	-	**0.0014**	**0.0013**	< 0.001	0.03	0.007	0.022	0.003	0.002
Lead, Pb	-	**0.0034**	**0.0044**	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001
Mercury (Total), Hg	-	**0.00006**	**0.0001**	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel, Ni	-	**0.011**	**0.007**	0.03	0.012	0.067	0.062	0.21	0.34
Zinc, Zn	-	**0.008**	**0.015**	0.048	0.076	0.21	0.023	0.089	0.77
Alkali Metals									
Calcium	-			220	43	74	250	340	150
Magnesium	-			850	140	380	380	770	700
Potassium	-			26	4.2	14	53	53	32
Sodium	-			4800	1800	3200	3300	4900	4700
Alkalinity (speciated)									
Bicarbonate Alkalinity (as CaCO3)	-			430	< 20	23	1100	320	110
Carbonate Alkalinity (as CaCO3)	-			< 10	< 10	< 10	< 10	< 10	< 10
Hydroxide Alkalinity (as CaCO3)	-			< 20	< 20	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	-			430	< 20	23	1100	320	110
Other Inorganics									
Ammonia as NH3	-	**0.9**	**0.91**	0.53	0.23	0.41	1.2	0.47	0.42
Chloride	-			10000	3200	6100	5400	10000	9600
Conductivity (at 25Â°C)	-			14000	4900	11000	9100	14000	23000
Nitrate (as N)	-			5.7	0.35	0.18	0.07	< 0.02	0.17
pH (at 25Â°C)				6.9	5.7	5.7	7.1	6.7	5.9
Sulphate (as SO4)	-			920	710	960	740	960	730
Total Dissolved Solids Dried at 180Â°C Â±	-			17000	5300	9900	10000	16000	17000
Monocyclic Aromatic Hydrocarbons									
Benzene	**5**	**1**	**0.5**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	**Not Limiting**	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	**Not Limiting**	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes	**Not Limiting**	**0.35 (as o-xylene)**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes	**Not Limiting**	**0.2 (as p-xylene)**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	**Not Limiting**	**0.016**	**0.05**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo[a]pyrene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Total Recoverable Hydrocarbons									
TRH C10-36 (Total)	-	**-**	**-**	0.15	0.13	0.17	0.09	0.06	0.13
TRH C10-C14	-	**-**	**-**	0.35	0.33	0.17	0.29	< 0.1	0.13
TRH C15-C28	-	**-**	**-**	0.2	0.2	< 0.1	0.2	< 0.1	< 0.1
TRH C29-C36	-	**-**	**-**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C9	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Naphthalene	-	**-**	**-**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16	-	**-**	**-**	0.07	0.05	0.08	< 0.05	< 0.05	0.05
TRH >C10-C16 less Naphthalene (F2)	-	**-**	**-**	0.07	0.05	0.08	< 0.05	< 0.05	0.05
TRH >C10-C40 (total)*	-	**-**	**-**	0.27	0.25	< 0.1	0.2	< 0.1	< 0.1
TRH >C16-C34	-	**-**	**-**	0.2	0.2	< 0.1	0.2	< 0.1	< 0.1
TRH >C34-C40	-	**-**	**-**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)	-	**-**	**-**	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Volatile Organic Compounds									
1.1.1.2-Tetrachloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	-	**0.16**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	-	**0.26**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	-	**0.06**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	-	**-**	**-**	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Total MAH*	-	**-**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
trans-1.2-Dichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 CHC (Total)*	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	-	**-**	**-**	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
Polychlorinated Biphenyls									
Aroclor-1016	-	**-**	**-**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1221	-	**-**	**-**	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Table LAR2
Bullecourt Road, Milperra, NSW
Groundwater Results Summary Table
9996-ER-1-1

			Sample ID	MW01	MW02	MW03	MW04	MW05	MW08
			Reference	S20-Ja04468	S20-Ja04469	S20-Ja04470	S20-Ja04471	S20-Ja04472	S20-Ja04473
			Date Sampled	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020	8/01/2020
			Sample Matrix	Water	Water	Water	Water	Water	Water
	NEPM (2013) - Table 1A(4)	**ANZECC & ARMCANZ (2000)**							
	Groundwater HSL's for Vapour Intrusion (SAND) - HSL D Commercial/Industrial 2m - <4m	**Fresh Waters**	**Marine Waters**						
	(mg/L)	**(mg/L)**	**(mg/L)**						
Aroclor-1232	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1242	-	**0.003**	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1248	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1254	-	**0.0000001**	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aroclor-1260	-	-	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total PCB*	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Organochlorine Pesticides	-	-	-						
4.4'-DDD	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin and Dieldrin (Total)*	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chlordanes - Total	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
d-BHC	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	-	-	-	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Endrin ketone	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	-	-	-	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Vic EPA IWRG 621 OCP (Total)*	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	-	-	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Organophosphorus Pesticides									
Azinphos-methyl	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Bolstar	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Chlorpyrifos	-	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chlorpyrifos-methyl	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Coumaphos	-	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-O	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Demeton-S	-	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Diazinon	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dichlorvos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Dimethoate	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Disulfoton	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
EPN	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethoprop	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ethyl parathion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fenitrothion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fensulfothion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Fenthion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Malathion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Merphos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Methyl parathion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Mevinphos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Monocrotophos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Naled	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Omethoate	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phorate	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	-	-	-	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Pyrazophos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Ronnel	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Terbufos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Tokuthion	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Trichloronate	-	-	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002

Table LAR3
Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, N
Relative Percent Difference
9996-ER-1-1

			Sample ID	BH01_0.0-0.2	DUP_01		BH01_0.0-0.2	DUP-1A		BH31_0.0-0.2
			Reference	S19-De29140	S19-De29225		S19-De29140	ES1942492001		S19-De29174
			Date Sampled	16/12/2019	16/12/2019		16/12/2019	16/12/2019		16/12/2019
			Sample Matrix	Soil	Soil		Soil	Soil		Soil
Group	Analyte	Units	LOR			RPD (%)			RPD (%)	
Metals	Arsenic	mg/kg	2	6.3	16	87	6.3	23	114	4.8
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4
	Chromium	mg/kg	5.0	17	34	67	17	36	72	9.8
	Copper	mg/kg	5.0	14	15	7	14	9	43	8.6
	Lead	mg/kg	5	16	29	58	16	21	27	18
	Mercury	mg/kg	0.1	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1
	Nickel	mg/kg	5	6.3	11	54	6.3	5	23	< 5
	Zinc	mg/kg	5	43	56	26	43	58	30	27
PAH	Acenaphthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Acenaphthylene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	0.6	0.6	0	0.6	0.6	0	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	1.2	1.2	0	1.2	1.2	0	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Chrysene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Fluoranthene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Fluorene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Phenanthrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Pyrene	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5
	Total PAH (18)	mg/kg	0.5	< 0.5	< 0.5	N/A	< 0.5	<0.5	N/A	< 0.5

RPD exceeding criteria

N/A Primary, Duplicate or Triplicate less than LOR and/or not analysed

DUP_02		BH31_0.0-0.2	DUP-2A		BH07_0.0-0.2	DUP_03		BH07_0.0-0.2	DUP-3A		BH08_0.0-0.2	DUP_04		BH08_0.0-0.2
S19-De29226		S19-De29174	ES1942492002		S19-De29152	S19-De29227		S19-De29152	ES1942492003		S19-De29154	S19-De29228		S19-De29154
16/12/2019		16/12/2019	16/12/2019		17/12/2019	17/12/2019		17/12/2019	17/12/2019		18/12/2019	18/12/2019		18/12/2019
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
8.5	56	4.8	9	61	11	19	53	11	11	0	3	3.8	24	3
< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4
15	42	9.8	25	87	20	24	18	20	19	5	6.4	7.9	21	6.4
13	41	8.6	11	24	16	21	27	16	15	6	23	25	8	23
28	43	18	27	40	25	36	36	25	28	11	31	36	15	31
< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1
< 5	N/A	< 5	5	N/A	12	16	29	12	12	0	< 5	< 5	N/A	< 5
43	46	27	44	48	32	40	22	32	34	6	91	93	2	91
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6
1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

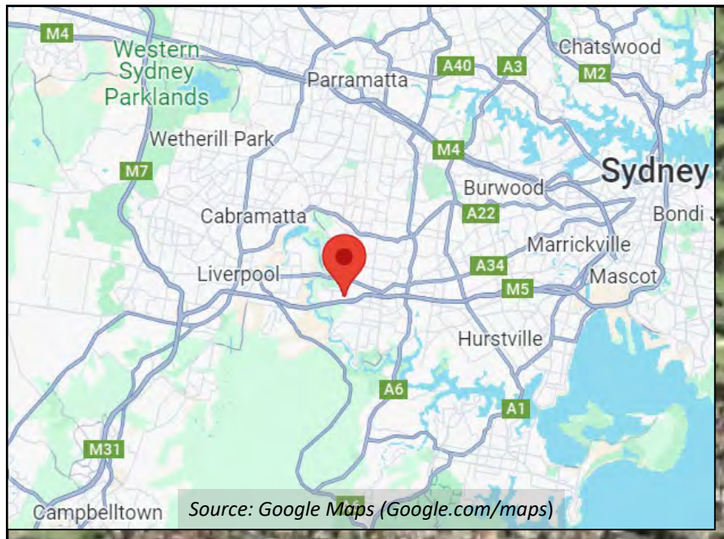
DUP-4A		BH54-0.0-0.2	DUP-05		DUP-05	DUP-5A		BH98-0.0-0.2	DUP-06		BH98-0.0-0.2	DUP-6A		TP09-0.0-0.2
ES1942492004		S20-Ja04493	S20-Ja04499		S20-Ja04499	ES2000668001		S20-Ja04495	S20-Ja04500		S20-Ja04495	ES2000668002		S20-Ja12898
18/12/2019		9/01/2020	9/01/2020		9/01/2020	9/01/2020		9/01/2020	9/01/2020		9/01/2020	9/01/2020		15/01/2020
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
<5	N/A	2.50	2.7	8	2.7	<5	N/A	< 2	< 2	N/A	< 2	<5	N/A	12
<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	< 0.4
6	6	6.80	7.2	6	7.2	7	3	< 5	< 5	N/A	< 5	8	N/A	16
23	0	11.00	13	17	13	12	8	8.8	8.9	1	8.8	12	31	20
26	18	8.40	9	7	9	10	11	11	13	17	11	18	48	25
<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1
4	N/A	< 5	< 5	N/A	< 5	4	N/A	< 5	< 5	N/A	< 5	3	N/A	7.7
86	6	39.00	40	3	40	42	5	41	39	5	41	51	22	51
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.60	0.60	0	0.60	0.6	0	0.60	0.60	0	0.60	0.6	0	0.6
1.2	0	1.20	1.20	0	1.20	1.2	0	1.20	1.20	0	1.20	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

DUP-07		TP09-0.0-0.2	DUP-7A		TP16-0.0-0.2	DUP-08		TP16-0.0-0.2	DUP-8A		TP12-0.0-0.2	DUP-09		TP12-0.0-0.2
S20-Ja12925		S20-Ja12898	ES2001581001		S20-Ja12938	S20-Ja12926		S20-Ja12938	ES2001581002		S20-Ja12935	S20-Ja12927		S20-Ja12935
15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020	15/01/2020		15/01/2020
Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)	
16	29	12	9.7	21	5.4	6.7	21	5.4	6.7	21	8.4	5.4	43	8.4
< 0.4	N/A	< 0.4	<0.1	N/A	< 0.4	< 0.4	N/A	< 0.4	0.1	N/A	< 0.4	< 0.4	N/A	< 0.4
29	58	16	15.2	5	9	8.5	6	9	7.7	16	18	11	48	18
40	67	20	19	5	22	27	20	22	22.1	0	26	32	21	26
26	4	25	23	8	19	23	19	19	19.7	4	30	35	15	30
< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1
6.2	22	7.7	4.7	48	17	24	34	17	16	6	8.8	38	125	8.8
55	8	51	43.7	15	79	99	22	79	78.8	0	79	99	22	79
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6
1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5

DUP-9A		BH97_0.0-0.2	DUP_14		BH97_0.0-0.2	DUP-14A		MW01	DUP-01		MW01	Dup-1A	
ES2001581003		S19-De29222	S19-De29229		S19-De29222	ES1942492009		S20-Ja04468	S20-Ja04474		S20-Ja04468	ES2000668003	
15/01/2020		18/12/2019	18/12/2019		18/12/2019	18/12/2019		8/01/2020	8/01/2020		8/01/2020	8/01/2020	
Soil		Soil	Soil		Soil	Soil		Groundwater	Groundwater		Groundwater	Groundwater	
	RPD (%)			RPD (%)			RPD (%)			RPD (%)			RPD (%)
6.2	30	5	5.4	8	5	<5	N/A	0.001	0.001	0	0.001	0.001	0
<0.1	N/A	< 0.4	< 0.4	N/A	< 0.4	<1	N/A	0.0017	0.0017	0	0.0017	0.0017	0
13.7	27	7.3	8	9	7.3	5	37	< 0.001	< 0.001	N/A	< 0.001	0.001	N/A
26.7	3	14	12	15	14	11	24	< 0.001	< 0.001	N/A	< 0.001	0.003	N/A
20.7	37	19	22	15	19	15	24	0.001	0.001	0	0.001	0.001	0
<0.1	N/A	< 0.1	< 0.1	N/A	< 0.1	<0.1	N/A	< 0.0001	< 0.0001	N/A	< 0.0001	<0.0001	N/A
14.7	50	< 5	< 5	N/A	< 5	3	N/A	0.022	0.019	15	0.022	0.03	31
75.4	5	71	70	1	71	74	4	0.048	0.043	11	0.048	0.069	36
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
0.6	0	0.6	0.6	0	0.6	0.6	0	-	-	N/A	-	-	N/A
1.2	0	1.2	1.2	0	1.2	1.2	0	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A
< 0.5	N/A	< 0.5	< 0.5	N/A	< 0.5	< 0.5	N/A	-	-	N/A	-	-	N/A

SEG (February 2024)

Supplementary DSI



Source: Google Maps (Google.com/maps)

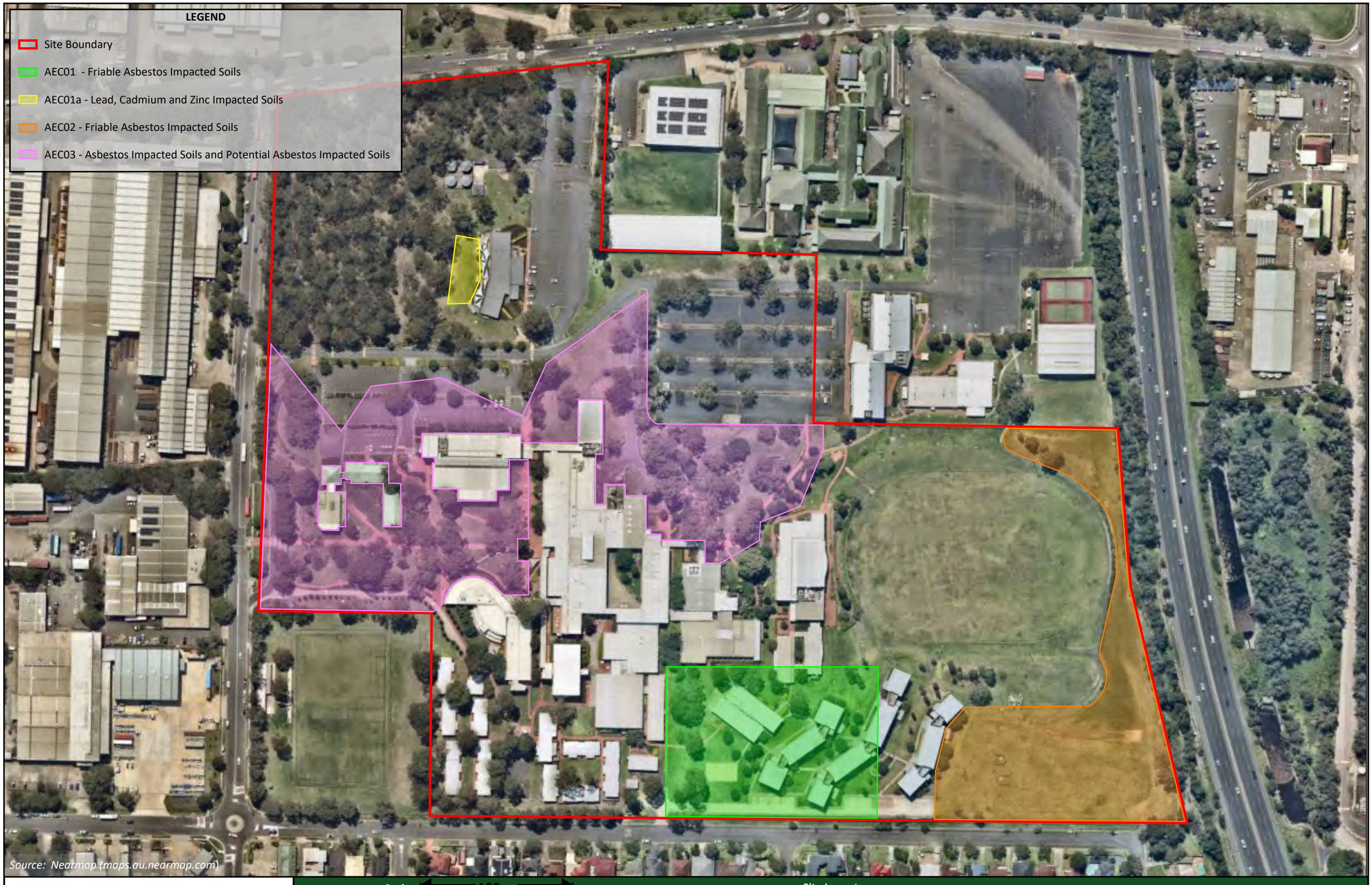
Site

Subject Site
Western Sydney University - Milperra Campus, Milperra NSW

Source: Nearmap (maps.au.nearmap.com)

Sydney Environmental Group

Site Locality				
Client Name:	Mirvac Pty Ltd	N	Figure Number:	1
Project Name:	Supplementary Detailed Site Investigation		Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-220224.v1d



Scale:	100 m	Site Layout	
Client Name:	Mirvac Pty Ltd	Figure Number:	2
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group



Scale:	25 m	Sampling Plan - AEC01		
Client Name:	Mirvac Pty Ltd		Figure Number:	3
Project Name:	Supplementary Detailed Site Investigation		Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group



Source: Nearmap (maps.au.nearmap.com)

Scale:	25 m	Sampling Plan - AEC02	
Client Name:	Mirvac Pty Ltd	N	Figure Number: 4
Project Name:	Supplementary Detailed Site Investigation		Figure Date: 22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number: 2300-DSI-01-220224.v1d

Sydney Environmental Group



Sydney Environmental Group	Scale: 50 m	Sampling Plan - AEC03	
	Client Name: Mirvac Pty Ltd	N	Figure Number: 5
	Project Name: Supplementary Detailed Site Investigation		Figure Date: 22 February 2024
	Project Location: Western Sydney University – Milperra Campus, Milperra NSW		Report Number: 2300-DSI-01-220224.v1d



Scale:	25 m	Asbestos Extent within AEC01	
Client Name:	Mirvac Pty Ltd	Figure Number:	6
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group

Notes:

- TP01 - ACM = 0.15 % w/w at 0.3 m bgl
- TP06 - ACM = 0.004% at 0.3 m bgl
- TP11 - FA = 0.00023, ACM = 0.37% at 0.3 m bgl
- TP19 - ACM = 0.01% at 0.3 m bgl
- TP20 - ACM = 0.03% at 0.3 m bgl
- TP22 - ACM = 0.003% at 0.3 m bgl
- TP27 - ACM = 0.03% at 0.3 m bgl
- TP35 - ACM = 0.003% at 0.3 m bgl
- TP38 - ACM = 0.01% at 0.3 m bgl
- TP39 - ACM = 0.02% at 0.3 m bgl
- TP47 - ACM = 0.30% at 0.3 m bgl
- TP48 - ACM = 0.02% at 0.3 m bgl
- TP09 - Surficial ACM observed
- BH21 - FA detected at <0.001% w/w at 0.3 m bgl
- TP/BH101 - Surficial ACM observed
- EBH24 - FA detected at 1.1 m bgl
- EBH25 - FA detected at 0.2 m bgl

*FA = Friable Asbestos, AF = Asbestos Fines, ACM = Asbestos Containing Material

LEGEND

- Site Boundary
- Subject Area - AEC01 (AG 2020)
- Friable Asbestos Impacted Fill Soils (Coffey 2011)
- Non-Friable Asbestos Impacted Fill Soils (SE 2024)
- Sampling Locations - Asbestos Identified (SE 2024)
- Sampling Locations - No Asbestos Identified (SE 2024)
- Approximate Sampling Locations - Asbestos Identified (AG 2020)
- Approximate Sampling Locations - Asbestos Identified (Coffey 2011)

TP01, TP02, TP03, TP05, TP06, TP07, TP12, TP11, TP10, TP13, TP14, TP15, TP20, TP19, BH21, TP18, TP21, TP22, TP23, TP27, TP26, TP25, TP28, TP30, EBH25, TP31, TP34, TP33, EBH24, TP32, TP39, TP40, TP35, TP36, TP09, TP37, TP38, TP41, TP42, TPBH101, TP43, TP44, TP45, TP46, TP47, TP48, TP49, TP50, TP51, TP52, TP53

Ashford Avenue

Source: Nearmap (maps.au.nearmap.com)

Scale:	25 m	Asbestos Extent within AEC02	
Client Name:	Mirvac Pty Ltd	Figure Number:	7
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group

N

Notes:

- TP19 - ACM = 0.085 % w/w at 0.3 m bgl
- TP28 - ACM = 0.191 % w/w at 0.3 m bgl
- TP42 - ACM = 0.006 % w/w at 0.3 m bgl
- TP57 - ACM = 0.053 % w/w at 0.3 m bgl
- TP68 - ACM = 0.344 % w/w at 0.3 m bgl
- TP70 - ACM = 0.156 % w/w at 0.3 m bgl
- TP71 - ACM = 0.002 % w/w at 0.3 m bgl
- TP53 - ACM = > 0.01 % w/w at 0.3 m bgl
- TP56 - ACM = > 0.01 % w/w at 0.3 m bgl
- BH59 - Surficial ACM observed

*FA = Friable Asbestos, AF = Asbestos Fines, ACM = Asbestos Containing Material

LEGEND

- Site Boundary
- Subject Area - AEC03 (AG 2020)
- AEC05 - Building Footprints (AG 2020)
- Inaccessible Areas
- Non-Friable Asbestos Impacted Fill Soils
- Sampling Locations - Asbestos Identified (SE 2024)
- Sampling Locations - No Asbestos Identified (SE 2024)
- Approximate Sampling Locations - Asbestos Identified (AG 2020)
- Approximate Sampling Locations - Asbestos Identified (Coffey 2011)

TP01 TP02 TP03 TP04 TP05 TP06 TP07 TP08 TP09 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42 TP43 TP44 TP45 TP46 TP47 TP48 TP49 TP50 TP51 TP52 TP53 TP54 TP55 TP56 TP57 TP58 TP59 TP60 TP61 BH69 TP62 TP63 TP64 TP65 TP66 TP67 TP68 TP69 TP70 TP71 TP72 TP73 TP74 TP75 TP56 TP53 TP76 TP77 TP78 TP79 TP80 TP81 TP82 TP83 TP84

Scale:	50 m	Asbestos Extent within AEC03	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Supplementary Detailed Site Investigation	Figure Date:	22 February 2024
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-220224.v1d

Sydney Environmental Group

Sydney Environmental

Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - Bonded ACM	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC01-TP01-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP04-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP05-0.2-0.3	19/01/2024	0.001%	0.01%	Asbestos Detected	**0.00022%**	<0.01%	13600	-	-	-
AEC01-TP06-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC01-TP07-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP08-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP09-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP10-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC01-TP11-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP13-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC01-TP14-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC01-TP15-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC01-TP16-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP17-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00032%**	<0.01%	11500	25	3.75	**0.033%**
AEC01-TP18-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC01-TP19-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC01-TP20-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP21-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11800	-	-	-
AEC01-TP22-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC01-TP23-0.2-0.3	19/01//2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.058%**	12700	-	-	-
AEC02-TP01-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	130	19.5	**0.150%**
AEC02-TP02-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC02-TP03-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC02-TP04-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP05-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC02-TP06-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	4	0.6	**0.004%**
AEC02-TP07-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC02-TP08-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP09-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP10-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP11-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00023%**	<0.01%	13000	321	48.15	**0.370%**
AEC02-TP12-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11300	-	-	-
AEC02-TP13-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP14-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP15-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP16-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC02-TP17-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC02-TP18-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP19-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13700	6	0.9	**0.007%**
AEC02-TP20-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12800	28	4.2	**0.033%**
AEC02-TP21-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC02-TP22-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	3	0.45	**0.003%**
AEC02-TP23-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC02-TP24-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14400	-	-	-
AEC02-TP25-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP26-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP27-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12600	27	4.05	**0.032%**
AEC02-TP28-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP29-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP30-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP31-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP32-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP33-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC02-TP34-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP35-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14000	3	0.45	**0.003%**
AEC02-TP36-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP37-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP38-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	10	1.5	**0.011%**
AEC02-TP39-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13000	16	2.4	**0.018%**
AEC02-TP40-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP41-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP42-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP43-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC02-TP44-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12000	-	-	-
AEC02-TP45-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP46-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC02-TP47-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13800	276	41.4	**0.300%**
AEC02-TP48-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	18	2.7	**0.019%**
AEC02-TP49-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-

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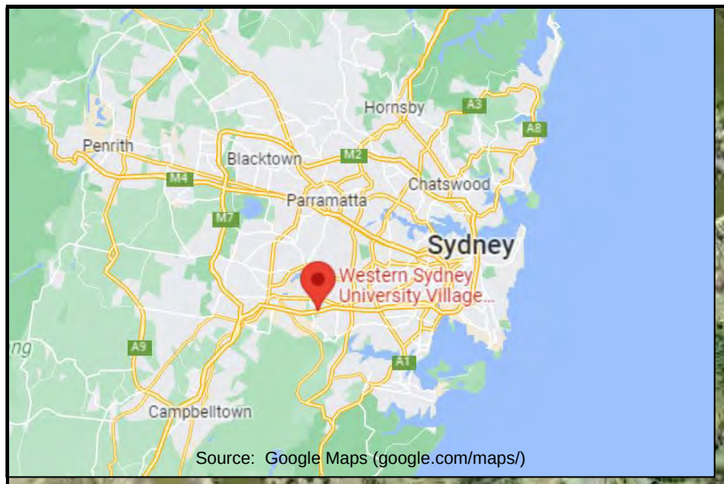
Sample ID	Date Sampled	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - FA/AF	Asbestos Health Screening Level NEPM ASC 2013 (% w/w) HIL A - Bonded ACM	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC02-TP50-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	0.004%	13900	-	-	-
AEC02-TP51-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP52-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15100	-	-	-
AEC03-TP02-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP03-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12300	-	-	-
AEC03-TP04-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC03-TP05-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP06-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP07-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP08-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP09-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15300	-	-	-
AEC03-TP10-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP12-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP18-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14700	-	-	-
AEC03-TP19-0.2-0.3	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	66	9.9	**0.085%**
AEC03-TP20-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP21-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP22-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP23-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP24-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP27-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC03-TP28-0.2-0.3	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	16400	209	31.35	**0.191%**
AEC03-TP29-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14600	-	-	-
AEC03-TP30-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP32-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP33-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP34-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP35-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP39-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP40-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP41-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP42-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	5	0.75	**0.006%**
AEC03-TP43-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP44-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC03-TP57-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	51	7.65	**0.053%**
AEC03-TP58-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC03-TP60-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP61-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP62-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP63-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP64-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP66-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP67-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC03-TP68-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13500	310	46.5	**0.344%**
AEC03-TP70-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14600	152	22.8	**0.156%**
AEC03-TP71-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	2	0.3	**0.002%**
AEC03-TP72-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12200	-	-	-
AEC03-TP73-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP75-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP76-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14900	-	-	-
AEC03-TP77-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP78-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP79-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP80-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP84-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-

Legend

	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 AF/FA
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Bonded ACM
ACM	Asbestos Containing Material
FA and AF	Fibrous Asbestos and Asbestos Fines
NL	Not Limiting
-	Detected at below the limit of reporting

SEG (February 2024)

HAZMAT



Source: Google Maps (google.com/maps/)

Subject Site
Western Sydney University - Bankstown Campus

MILPERRA ROAD
HENRY LAWSON DRIVE
SOUTH WESTERN MOTORWAY
BEACONSFIELD STREET
QUEEN STREET
BRANSGROVE ROAD
HORSLEY ROAD
WESTON STREET

Source: Nearmap (apps.nearmap.com/maps/)

Sydney Environmental Group

Scale:	500 m	Site Locality	
Client Name:	Mirvac Group Pty Ltd	Figure Number:	1
Project Name:	Hazardous Building Materials Survey	Figure Date:	31 October 2023
Project Location:	Western Sydney University - Bankstown Campus, Milperra NSW	Report Number:	2300-HBMS-01-081123.v2f

N



Scale:	100 m	Site Layout	
Client Name:	Mirvac Group Pty Ltd	Figure Number:	2
Project Name:	Hazardous Building Materials Survey	Figure Date:	06 November 2023
Project Location:	Western Sydney University, Bankstown Campus	Report Number:	2300-HBMS-01-071123.v1f

Sydney Environmental Group

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Hazardous Building Materials Register

Inspected By: Mitchell Kirby, Oliver Warren
Inspection Date: 23/10/2023 and 20/2/2024

Address: Western Sydeny University - Bankstown Campus

Inaccessible Areas: All live electrical equipment
Areas above three metres

Date	LOCATION			MATERIAL DESCRIPTION									RISK MANAGEMENT			CORRECTIVE ACTIONS			
	Building	Room	Surface	Material Application	Quantity	Units	Sample Type	Sample ID No.	Photo No.	Analytical Result	Friability	Material Condition as Surveyed	Risk Status	Control Recommendations/ Comments	Review date	Consultant/ Hygienist Name	Control Action Taken	Date Actioned	Contractor Details
All Buildings Assessed																			
23/10/2023 and 20/2/2024	Building 01	Exterior / Interior	Fire System	Paint System	NC	sq.m	Paint	BLD01-EX-FIRESYSTEM-REDPC	1	**Lead Paint Detected**	-	Poor	Medium	Lead Paint detected 0.19% w/w. Maintain in current condition. Waste contaminated with lead (including lead paint waste) from residential premises or education or childcare institutions are considered General Solid Waste (GSW) and require no further management during demolition or disposal.	36 months					
Building 01, Exterior																			
20/02/2024	Building 01	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	6	2	**Presumed to Contain SMF**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					
Building 01, Interior																			
23/10/2023 and 20/2/2024	Building 01	Interior	Fire Door	Fiborous Building Matieral	12	Units	Fibrous mass	BLD01-INT-FIREDOOR	7	**SMF detected**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Rail	Paint System	2	sq.m	Paint	BLD01-INT-1.G.157-WHITE	6	**Lead Paint Detected**	-	Poor	Medium	Lead Paint detected 0.14% w/w. Maintain in current condition. Waste contaminated with lead (including lead paint waste) from residential premises or education or childcare institutions are considered General Solid Waste (GSW) and require no further management during demolition or disposal.	36 months					
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Pipe	Paint System	10	sq.m	Paint	BLD01-INT-1.G.157-GREEN	3	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Pipe	Paint System	1	sq.m	Paint	BLD01-INT-1.G.157-BLUE	9	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	11	**Presumed to contain SMF**	-	Good	-	Maintain in current condition. Remove prior to demolition.	-					
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Pipe	Paint System	10	sq.m	Paint	BLD01-INT-1.G.157-BROWN	4	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 01	Interior - G.157	Door frame	Paint System	8	Units	Paint	BLD01-INT-1.G.157-RED02	10	**Lead Paint Detected**	-	Poor	Medium	Lead Paint detected 0.4% w/w. Maintain in current condition. Waste contaminated with lead (including lead paint waste) from residential premises or education or childcare institutions are considered General Solid Waste (GSW) and require no further management during demolition or disposal.	36 months					
23/10/2023 and 20/2/2024	Building 01	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	N/A	5 / 11	**Presumed to Contain Asbestos**	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months					
Building 02, Exterior																			
23/10/2023 and 20/2/2024	Building 02	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	**Presumed to Contain SMF**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					
Building 02, Interior																			
23/10/2023 and 20/2/2024	Building 02	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	As 11	**Presumed to contain SMF**	-	Good	-	Maintain in current condition. Remove prior to demolition.	-					
23/10/2023 and 20/2/2024	Building 02	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	**Presumed to Contain Asbestos**	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months					
Building 03, Exterior																			
23/10/2023 and 20/2/2024	Building 03	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	**Presumed to Contain SMF**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					
Building 03, Interior																			
23/10/2023 and 20/2/2024	Building 03	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	**Presumed to contain SMF**	-	Good	-	Maintain in current condition. Remove prior to demolition.	-					
23/10/2023 and 20/2/2024	Building 03	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	**Presumed to Contain Asbestos**	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months					
Building 04, Exterior																			
23/10/2023 and 20/2/2024	Building 04	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	**Presumed to Contain SMF**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					
Building 04, Interior																			
23/10/2023 and 20/2/2024	Building 04	Interior - G.157	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	**Presumed to contain SMF**	-	Good	-	Maintain in current condition. Remove prior to demolition.	-					
23/10/2023 and 20/2/2024	Building 04	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	**Presumed to Contain Asbestos**	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months					
Building 05, Exterior																			
23/10/2023 and 20/2/2024	Building 05	Exterior	Eaves	Fibre Cement	50	sq.m	Fibre cement	BLD05-EX-EAVES	16	No asbestos detected	-	Good	-	-	-				
20/02/2024	Building 05	Exterior	Fibre cement panelling	Fibre Cement	100	sq.m	Fibre cement	Building 1 & 5 - EST - FC	44	**Asbestos detected**	Non-Friable	Good	Low	Maintain in current condition. Remove prior to demolition.	12 Months					
23/10/2023 and 20/2/2024	Building 05	Exterior	Beams	Paint System	25	sq.m	Paint	BLD05-EX-YELLOWPC	17	**Lead Paint Detected**	-	Good	Low	Lead Paint detected 1.1% w/w. Maintain in current condition. Waste contaminated with lead (including lead paint waste) from residential premises or education or childcare institutions are considered General Solid Waste (GSW) and require no further management during demolition or disposal.	36 Months					
23/10/2023 and 20/2/2024	Building 05	Exterior	Air Conditioning Unit	Internal Insulaion	4	Units	N/A	-	18	**Presumed to Contain SMF**	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months					

Hazardous Building Materials Register

Inspected By: Mitchell Kirby, Oliver Warren
Inspection Date: 23/10/2023 and 20/2/2024

Address: Western Sydeny University - Bankstown Campus

Inaccessible Areas: All live electrical equipment
Areas above three metres

Date	LOCATION			MATERIAL DESCRIPTION									RISK MANAGEMENT			CORRECTIVE ACTIONS			
	Building	Room	Surface	Material Application	Quantity	Units	Sample Type	Sample ID No.	Photo No.	Analytical Result	Friability	Material Condition as Surveyed	Risk Status	Control Recommendations/ Comments	Review date	Consultant/ Hygienist Name	Control Action Taken	Date Actioned	Contractor Details
Building 05, Interior																			
23/10/2023 and 20/2/2024	Building 05	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 05	G.02	Air Conditioning System	Internal Insulaion	8	sq.m	N/A	-	19	Presumed to contain SMF	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 05	G.02	Air Conditioning System	Paint System	8	sq.m	Paint	BLD05-5-G.02.PC-YELLOW	19	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 05	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 07, Exterior																			
23/10/2023 and 20/2/2024	Building 07	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 07, Interior																			
23/10/2023 and 20/2/2024	Bulding 07	Interior	Door frame	Paint System	5	Units	Paint	BLD07-DOORFRAME-PC	20	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 07	Interior	Hot Water System	Internal Insulaion	1	units	N/A	-	20	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 07	Interior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	21	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
23/10/2023 and 20/2/2024	Building 07	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 08, Exterior																			
23/10/2023 and 20/2/2024	Building 08	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 08, Interior																			
23/10/2023 and 20/2/2024	Building 08	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 08	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 09, Exterior																			
23/10/2023 and 20/2/2024	Building 09	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 09, Interior																			
23/10/2023 and 20/2/2024	Building 01	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 09	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 10, Exterior																			
23/10/2023 and 20/2/2024	Building 10	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 10, Interior																			
23/10/2023 and 20/2/2024	Building 10	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 10	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 11, Exterior																			
23/10/2023 and 20/2/2024	Building 11	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 11, Interior																			
23/10/2023 and 20/2/2024	Building 11	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 11	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 12, Exterior																			
23/10/2023 and 20/2/2024	Building 12	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				

Hazardous Building Materials Register

Inspected By: Mitchell Kirby, Oliver Warren
Inspection Date: 23/10/2023 and 20/2/2024

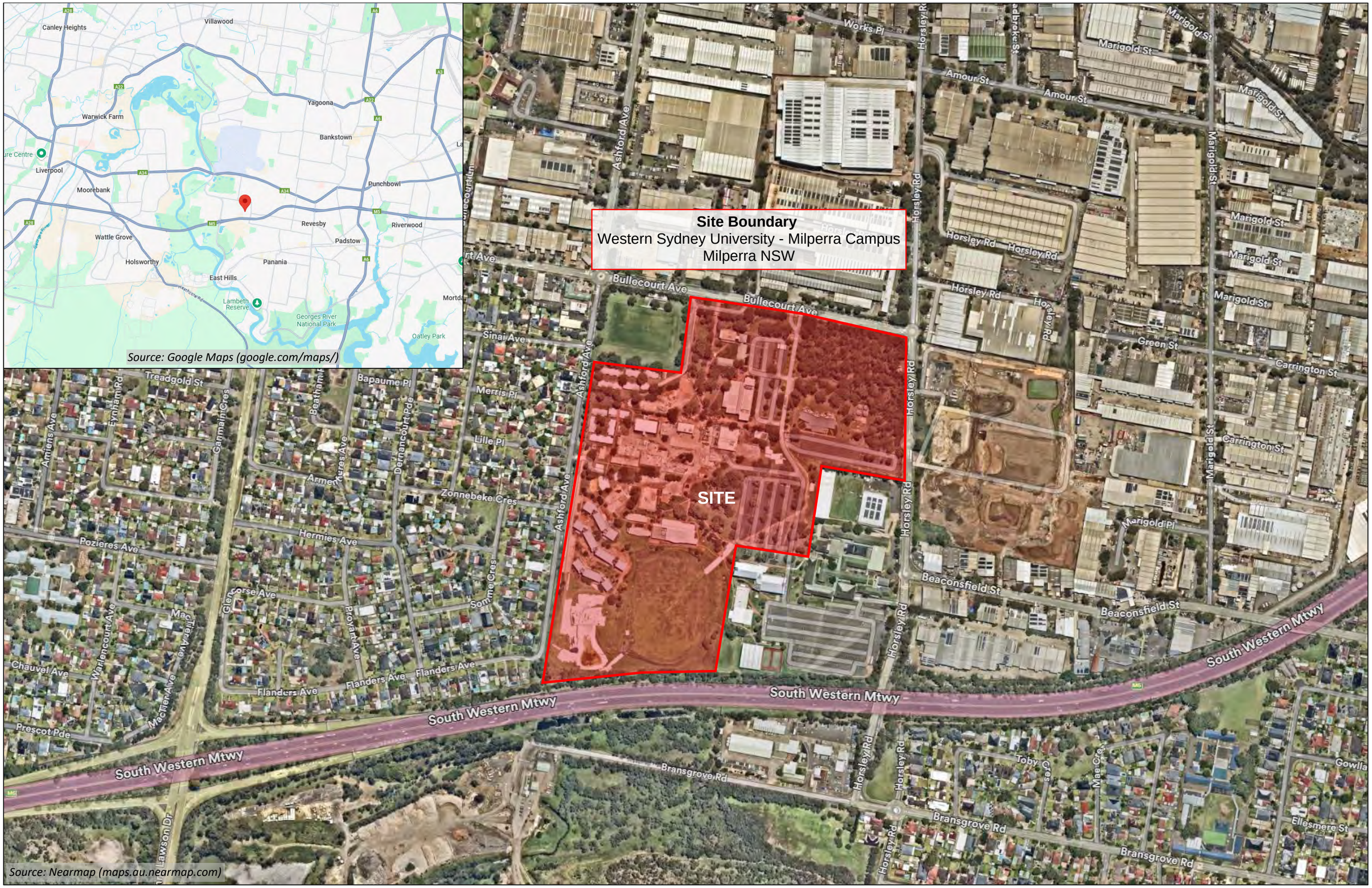
Address: Western Sydeny University - Bankstown Campus

Inaccessible Areas: All live electrical equipment
Areas above three metres

Date	LOCATION			MATERIAL DESCRIPTION									RISK MANAGEMENT			CORRECTIVE ACTIONS			
	Building	Room	Surface	Material Application	Quantity	Units	Sample Type	Sample ID No.	Photo No.	Analytical Result	Friability	Material Condition as Surveyed	Risk Status	Control Recommendations/ Comments	Review date	Consultant/ Hygienist Name	Control Action Taken	Date Actioned	Contractor Details
Building 12, Interior																			
23/10/2023 and 20/2/2024	Building 12	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 12	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 14, Exterior																			
23/10/2023 and 20/2/2024	Building 14	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	29	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 14, Interior																			
23/10/2023 and 20/2/2024	Building 14	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	As 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 14	Interior	Door frame	Paint System	50	Units	Paint	BLD14-DOORFRAME-PC	27	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 14	26.G.038.10	Wall	Paint System	25	sq.m	Paint	BLD14-26.G.038.10-INT-PC	31	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 14	27.G.020.10	Wall	Paint System	25	sq.m	Paint	BLD14.27.G.020.10-INT-PC	32	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 14	26.G.20-10	Pipe	Paint System	25	sq.m	Paint	BLD23-INT-PC-GREENPIPE	30	No lead paint detected	-	Good	-	-	-				
23/10/2023	Building 14	26.G.20-10	Pipe	Paint System	25	sq.m	Paint	BLD23-INT-PC-GREENPIPE	30	No lead paint detected	-	Good	-	-	-				
Building 20, Exterior																			
23/10/2023 and 20/2/2024	Building 20	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 20, Interior																			
23/10/2023 and 20/2/2024	Building 20	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 20	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 21, Exterior																			
23/10/2023 and 20/2/2024	Building 21	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 21, Interior																			
23/10/2023 and 20/2/2024	Building 21	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	As 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 21	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	Same as 4	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 22, Exterior																			
23/10/2023 and 20/2/2024	Building 22	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 22, Interior																			
23/10/2023 and 20/2/2024	Building 22	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 22	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	36	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 23, Exterior																			
23/10/2023 and 20/2/2024	Building 23	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 23, Interior																			
23/10/2023 and 20/2/2024	Building 23	Interior	AC	Paint System	10	sq.m	Paint	B23-INT-AC-PC	38	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 23	Interior	Hot Water System	Internal Insulaion	1	Units	N/A	-	40	Presumed to contain SMF	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 23	Interior	Pipe	Paint System	20	sq.m	Paint	BLD23-INT-PC-GREENPIPE	38	No lead paint detected	-	Good	-	-	-				
23/10/2023 and 20/2/2024	Building 23	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	39	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 24, Exterior																			
23/10/2023 and 20/2/2024	Building 24	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 24, Interior																			
23/10/2023 and 20/2/2024	Building 24	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				
23/10/2023 and 20/2/2024	Building 24	Interior	Electrical Distribution Box	Fibre Cement Insulating Board	1	sq.m	Fibre cement	-	42	Presumed to Contain Asbestos	Non-Friable	Good	Low	No sample collected dure to electrical hazard. Presumed to contain asbestos. Maintain in current condition. Remove prior to demolition.	36 months				
Building 27, Exterior																			
23/10/2023 and 20/2/2024	Building 27	Exterior	Air Conditioning Unit	Internal Insulaion	NC	Units	N/A	-	Same as 1	Presumed to Contain SMF	-	Good	Low	Maintain in current condition. Remove prior to demolition.	36 Months				
Building 27, Interior																			
23/10/2023	Building 27	Interior	Hot Water System	Internal Insulaion	NC	sq.m	N/A	-	Same as 11	Presumed to contain SMF	-	Good	-	Maintain in current condition. Remove prior to demolition.	-				

EGA (October 2025)

Post Demolition DSI



Scale :	150 m	Site Locality		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	1
Project Name:	Detailed Site Investigation		Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f

LEGEND

- Site Boundary
- **AEC01 (AG 2022)** - Investigation Area (Potential Friable Asbestos Impacted Soils)
- **AEC02 (AG 2022)** - Investigation Area (Potential Friable Asbestos Impacted Soils)
- **AEC03 (AG 2022)** - Investigation Area (Potential Asbestos Impacted Soils and Potential Asbestos Impacted Soils)
- **AEC05 (AG 2022)** - Structure Footprints (Previously un-assessed)

Investigation areas subject to assessment as part of the works completed by EGA in 2024 and 2025 for this report.

Summary of findings presented in Figure 11

Source: Nearmap (maps.au.nearmap.com)

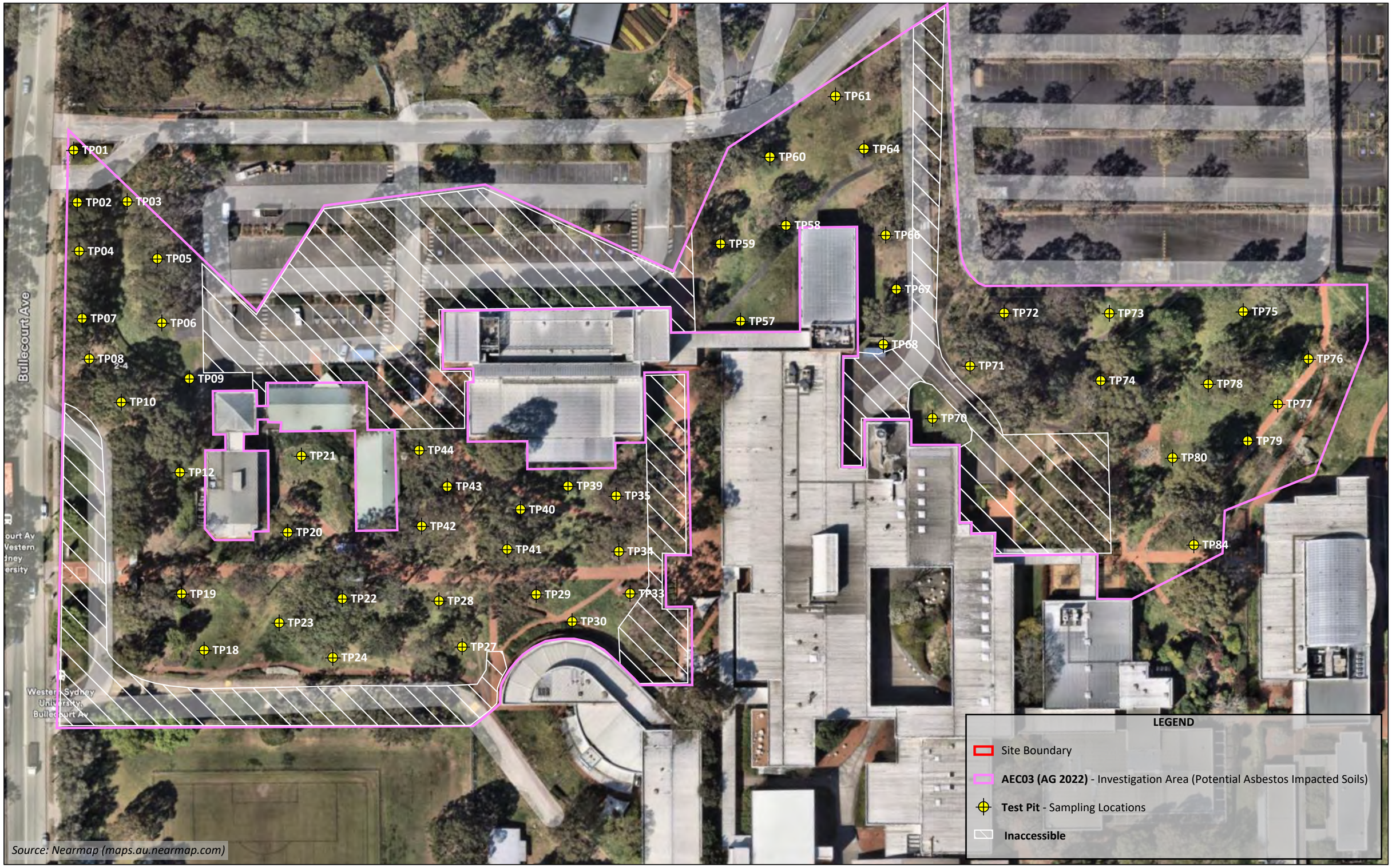
Scale :	65 m	Site Layout and Investigation Areas		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	2
Project Name:	Detailed Site Investigation		Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f



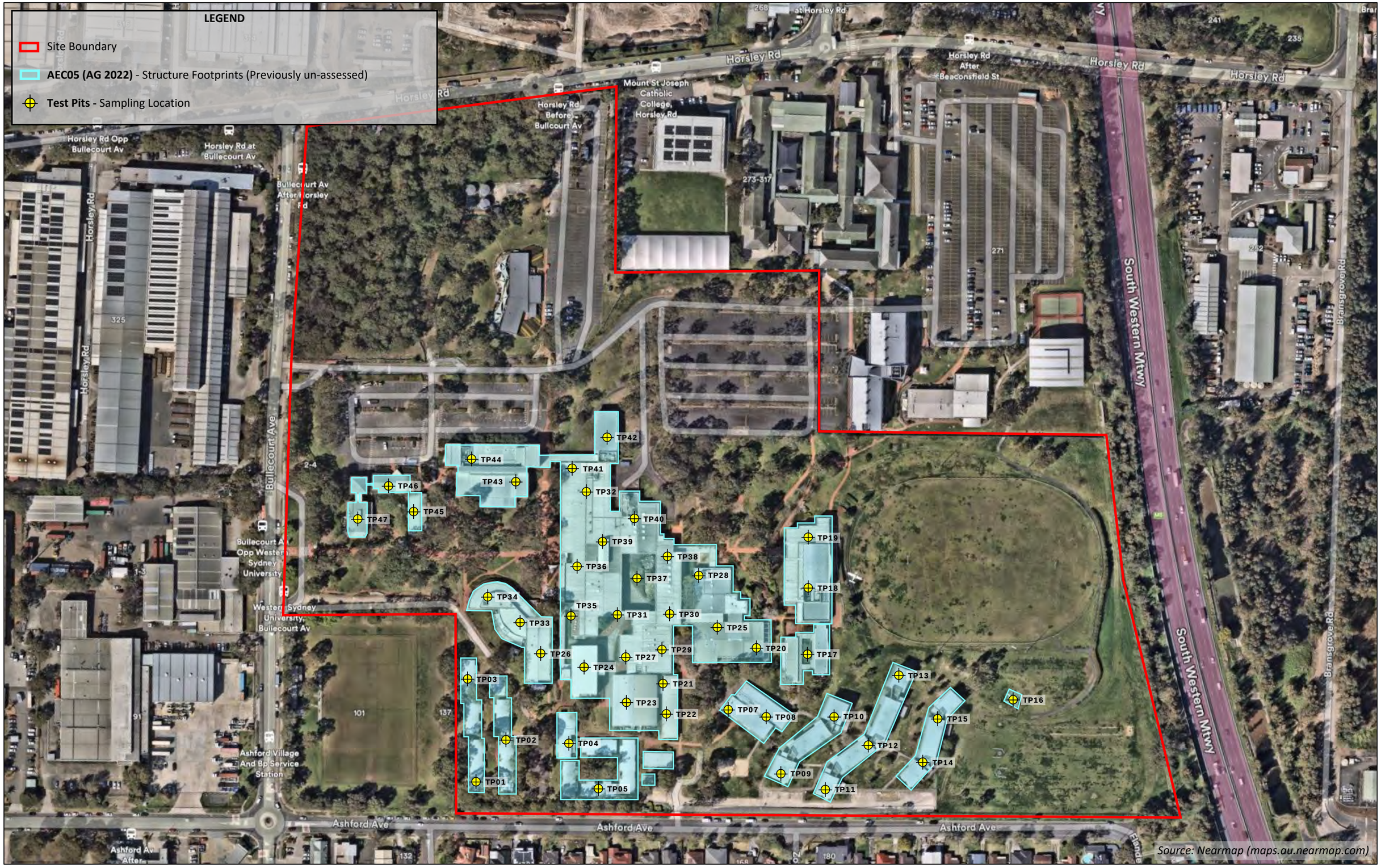
Scale :	15 m	Sampling Plan (AEC01)	
Client Name:	Mirvac Pty Ltd		Figure Number: 3
Project Name:	Detailed Site Investigation		Figure Date: 1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number: 2300-DSI-01-110325.v6f



Scale :	21 m	Sampling Plan (AEC02)		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	4
Project Name:	Detailed Site Investigation		Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f



Scale :	25 m	Sampling Plan (AEC03)	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Detailed Site Investigation	Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-110325.v6f

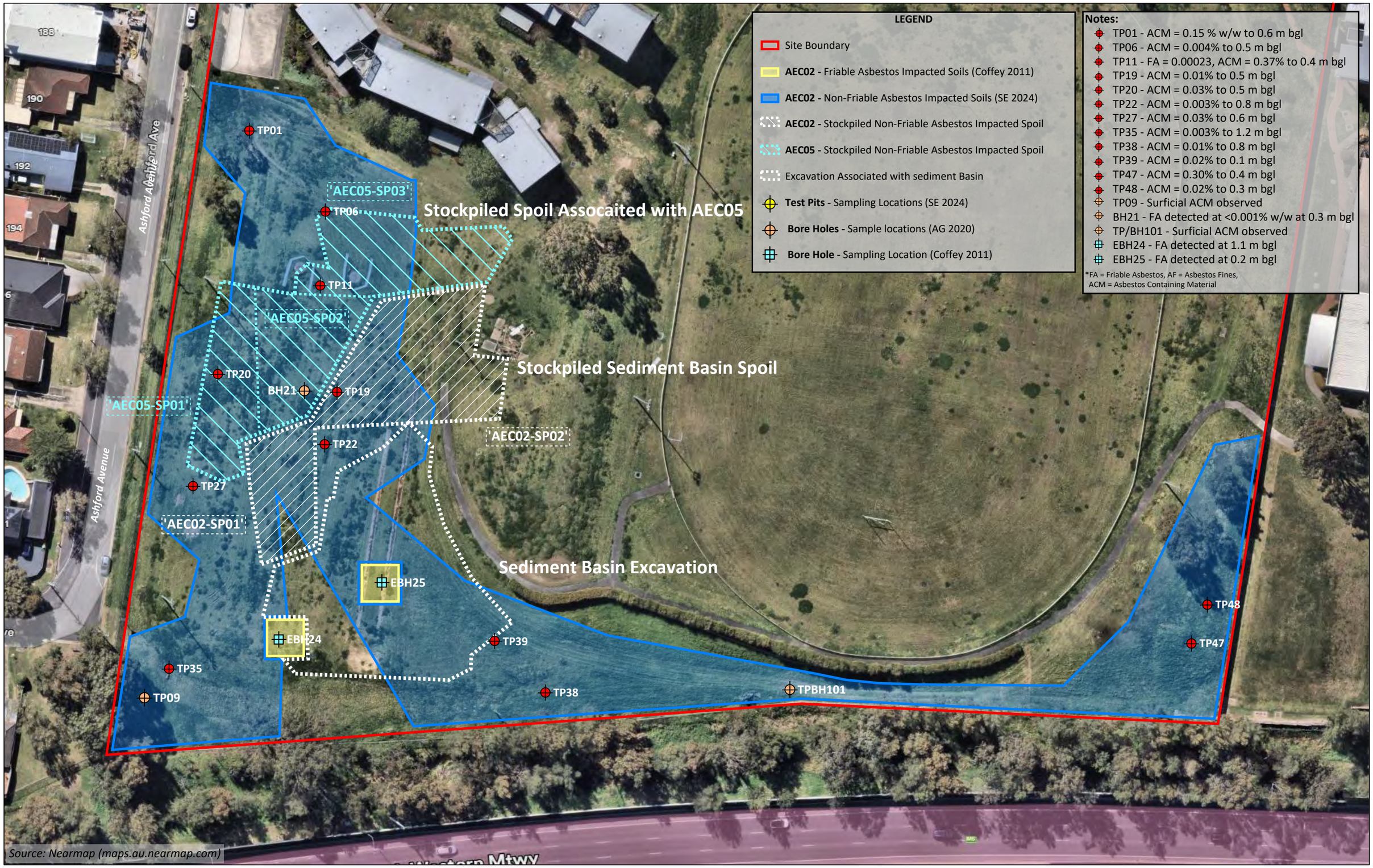


Source: Nearmap (maps.au.nearmap.com)

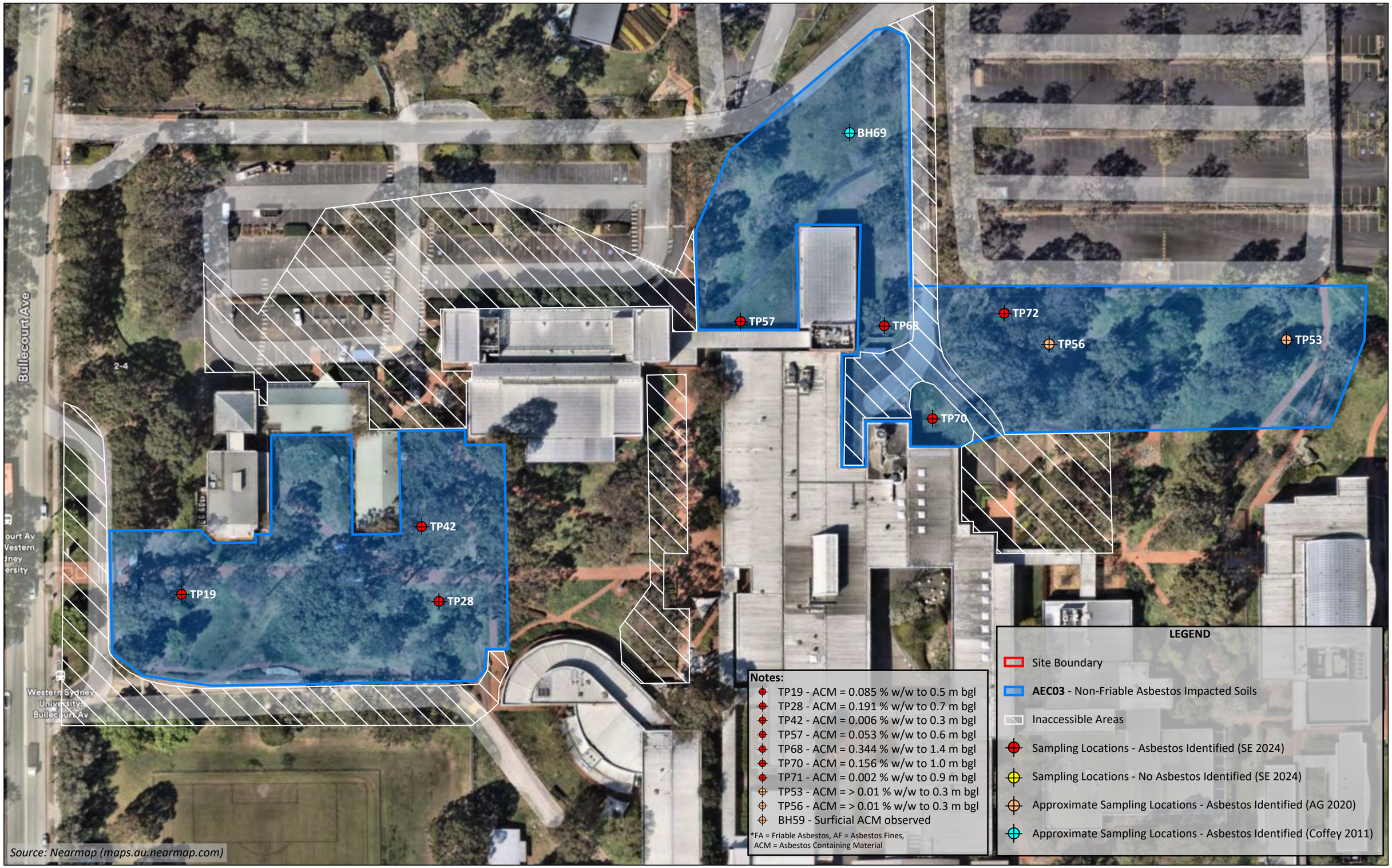
Scale :	65 m	Sampling Location (AEC05)		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	6
Project Name:	Detailed Site Investigation		Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f



Scale :	15 m	Identifed Extent of Asbestos (AEC01)	
Client Name:	Mirvac Pty Ltd	Figure Number:	7
Project Name:	Detailed Site Investigation	Figure Date:	1 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-110325.v6f



Scale :	21 m	Identifed Extent of Asbestos (AEC02)		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	8
Project Name:	Detailed Site Investigation		Figure Date:	11 March 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f



Scale :	25 m	Identifed Extent of Asbestos (AEC03)	
Client Name:	Mirvac Pty Ltd	Figure Number:	9
Project Name:	Detailed Site Investigation	Figure Date:	11 March 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-110325.v6f



Scale :	50 m	Identified Extent of Asbestos (AEC05)	
Client Name:	Mirvac Pty Ltd	Figure Number:	10
Project Name:	Detailed Site Investigation	Figure Date:	21 July 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-DSI-01-110325.v6f

LEGEND

- Site Boundary
- **AEC01** - Friable Asbestos Impacted Soils (EBH1)
- **AEC01** - Non-friable Asbestos Impacted Soils
- **AEC01a** - Lead, Cadmium and Zinc Impacted Soils
- **AEC02** - Non-Friable Asbestos Impacted Soils
- **AEC03** - Asbestos Impacted Soils and Potential Asbestos Impacted Soil
- **AEC04** - Former Underground Storage Tank
- **AEC05** - Non-friable asbestos impacted shallow fill soils
- Further Sampling Required in-line with updated RAP

Horsley Rd
Horsley Rd Before Bullcourt Av
Mount St Joseph Catholic College, Horsley Rd
Horsley Rd After Beaconsfield St
South Western Mtwy
Bullecourt Ave
Western Sydney University, Bullecourt Av
Ashford Village And Bp Service Station
Ashford Ave
Bransgrove Rd

Source: Nearmap (maps.au.nearmap.com)

Scale :	65 m	Areas of Environmental Concern		
Client Name:	Mirvac Pty Ltd		Figure Number:	11
Project Name:	Detailed Site Investigation		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-DSI-01-110325.v6f

Group	Analyte	Units	PQL	# Samples	# Detects	Minimum	Average	Standard Deviation	95% UCL	Maximum	Sample ID	TP01-0.1-0.2	TP02-0.1-0.2	TP03-0.1-0.2	TP04-0.1-0.2	TP05-0.1-0.2	TP07-0.1-0.2	TP07-1.0-1.1	TP07-2.0-2.1	TP08-0.1-0.2	TP08-1.0-1.1	TP08-2.0-2.1	TP09-0.1-0.2	TP09-0.2-0.3	TP10-0.1-0.2	TP10-1.0-1.1	TP10-2.0-2.1	TP11-0.1-0.2	TP11-0.4-0.5	TP12-0.1-0.2	TP12-0.9-1.0	TP13-0.1-0.2	TP13-0.3-0.4	TP13-0.6-0.7	TP13-1.5-1.6	TP14-0.1-0.2	TP14-0.4-0.5	TP14-0.8-0.9	TP15-0.1-0.2	TP15-0.4-0.5	TP15-0.6-0.7	TP15-0.9-1.0	TP16-0.1-0.2	TP16-0.4-0.5
											Reference / Sample Date	ES2510979022 15/04/25	ES2510979023 15/04/25	ES2509826003 03/04/25	ES2509826004 03/04/25	ES2509826005 03/04/25	ES2510979016 15/04/25	ES2510979017 15/04/25	ES2510979018 15/04/25	ES2510979019 15/04/25	ES2510979020 15/04/25	ES2509826001 03/04/25	ES2509826002 03/04/25	ES2510979021 15/04/25	ES2509826007 03/04/25	ES2509826008 03/04/25	ES2509826009 03/04/25	ES2509826010 03/04/25	ES2509826011 03/04/25	ES2509826012 03/04/25	ES2509826013 03/04/25	ES2509826014 03/04/25	ES2509826015 03/04/25	ES2509826016 03/04/25	ES2509826017 03/04/25	ES2509826018 03/04/25	ES2509826019 03/04/25	ES2509826020 03/04/25	ES2509826021 03/04/25	ES2509826022 03/04/25	ES2510979001 15/04/25	ES2510979002 15/04/25	ES2510979003 15/04/25	ES2510979004 15/04/25
Metals	Arsenic	mg/kg	5	18	9	6	4	2	-	17	<5	6	6	<5	7	<5	8	<5	7	6	<5	<5	12	8	<5	<5	7	9	<5	11	<5	<5	12	17	9	<5	6	<5	<5	12	8	<5	<5
	Cadmium	mg/kg	1	18	0	0	NC	NC	-	ND	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium (Total)[1]	mg/kg	2	18	18	4	14	6	-	27	8	8	6	12	8	19	16	4	16	11	5	13	18	13	8	7	16	17	14	17	17	27	21	22	18	10	19	9	17	14	21	7	19
	Copper	mg/kg	5	18	15	8	13	7	-	35	<5	32	11	23	12	13	14	8	13	14	10	8	24	15	18	35	<5	16	22	15	<5	<5	17	19	15	5	10	<5	<5	21	15	8	8
	Lead	mg/kg	5	18	18	8	17	9	-	73	5	23	13	14	16	14	13	16	20	11	9	15	48	22	17	16	13	29	19	15	8	8	16	40	17	14	13	8	6	73	14	17	10
	Nickel	mg/kg	2	18	13	2	4	3	-	22	<2	22	7	11	4	12	<2	5	<2	<2	3	8	4	8	5	<2	5	4	3	2	3	6	6	4	<2	5	2	<2	10	2	3	7
	Zinc	mg/kg	5	18	13	6	31	34	-	199	18	81	46	47	54	47	<5	<5	38	6	<5	38	142	54	38	36	<5	61	31	25	12	<5	24	59	36	21	6	20	<5	193	6	26	7
	Mercury (Inorganic)	mg/kg	0.1	18	0	0	NC	NC	-	ND	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PAH	Naphthalene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b+j)fluoranthene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dibenz(a.h)anthracene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(g.h.i)perylene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total PAH (18)	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	18	18	0.6	0.6	0.0	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	18	18	1.2	1.2	0.0	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
TRH	TRH C6-C9	mg/kg	10	18	0	0	NC	NC	-	ND	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH C10-C14	mg/kg	50	18	0	0	NC	NC	-	ND	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH C15-C28	mg/kg	100	18	0	0	NC	NC	-	ND	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C29-C36	mg/kg	100	18	0	0	NC	NC	-	ND	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C10-C36 Total	mg/kg	50	18	0	0	NC	NC	-	ND	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH C6-C10	mg/kg	10	18	0	0	NC	NC	-	ND	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH C6-C10 minus BTEX (F1)	mg/kg	10	18	0	0	NC	NC	-	ND	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH >C10-C16 (F2)	mg/kg	50	18	0	0	NC	NC	-	ND	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH >C16-C34 (F3)	mg/kg	100	18	0	0	NC	NC	-	ND	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH >C34-C40 (F4)	mg/kg	100	18	0	0	NC	NC	-	ND	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
	TRH C10-C40 Total (F bands)	mg/kg	50	18	0	0	NC	NC	-	ND	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	18	0	0	NC	NC	-	ND	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX	Benzene	mg/kg	0.2	18	0	0.0	NC	NC	-	ND	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	m/p-xylene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	o-xylene	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Xylenes	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
OCP	alpha-BHC	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene (HCB)	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	beta-BHC	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	gamma-BHC - (Lindane)	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	delta-BHC	mg/kg	0.5	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.5	18	0	0.00	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.5	18	1	0.2	0.0	NC	-	0.67	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Total Chlordane (sum)	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	trans-Chlordane	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	alpha-Endosulfan	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	cis-Chlordane	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	4.4`-DDE	mg/kg	0.1	18	3	0.1	0.0	0.0	-	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.06	<0.05	<0.05	<0.05	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
	Endrin	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan (sum)	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	beta-Endosulfan	mg/kg	0.1	18	0	0.0	NC	NC	-	ND	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Group	Analyte	Units	PQL	TP17-0.1-0.2	TP17-1.0-1.1	TP17-2.0-2.1	TP18-0.1-0.2	TP18_1.0-1.1	TP18-2.0-2.1	TP19-0.1-0.2	TP19-1.0-1.1	TP19-2.0-2.1	TP20-0.1-0.2	TP20-1.0-1.1	TP20-2.0-2.1	TP21-0-0.1	TP22-1.1-1.2	TP22-0.1-0.2	TP23-0.1-0.2	TP24-0.1-0.2	TP25-0.1-0.2	TP25-0.2-0.3	TP25-0.4-0.5	TP25-1.0-1.1	TP25-2.0-2.1	TP26-0.1-0.2	TP26-1.1-1.2	TP27-0.1-0.2	TP28-0.1-0.2	TP28-0.3-0.4	TP28-1.0-1.1	TP28-2.0-2.1	TP29-0.1-0.2	TP30-0.1-0.2	TP30-1.1-1.2	TP31-0.1-0.2	TP32-0.1-0.2	TP32-0.5-0.6	TP33-0.1-0.2	TP34-0.1-0.2	TP35-0.1-0.2
				ES2510979005 15/04/25	ES2510979006 15/04/25	ES2510979007 15/04/25	ES2510979008 15/04/25	ES2510979009 15/04/25	ES2512173001 29/04/25	ES2510979010 15/04/25	ES2510979011 15/04/25	ES2510979012 15/04/25	ES2510979013 15/04/25	ES2510979014 15/04/25	ES2510979024 15/04/25	ES2510979025 15/04/25	ES2525227302 7 21/07/25	ES2525227302 6 21/07/25	ES2525227302 5 21/07/25	ES2525227302 4 21/07/25	ES2510979026 15/04/25	ES2510979027 15/04/25	ES2510322001 09/04/25	ES2510322002 09/04/25	ES2509826025 03/04/25	ES2525227301 8 21/07/25	ES2525227301 8 21/07/25	ES2525227302 2 21/07/25	ES2510979024 15/04/25	ES2510979025 15/04/25	ES2510979026 15/04/25	ES2510979027 15/04/25	ES2510322022 09/04/25	ES2510322020 21/07/25	ES2510322021 21/07/25	ES2510322019 21/07/25	ES2510322001 09/04/25	ES2510322002 09/04/25	ES2522273016 21/07/2025	ES2522273015 21/07/2025	ES2522273014 21/07/2025
Metals	Arsenic	mg/kg	5	5	<5	6	<5	<5	<5	<5	<5	5	5	12	<5	7	34	<5	8	5	<5	<5	12	7	<5	6	<5	8	8	9	<5	<5	8	8	9	10	<5	<5	<5	8	<5
	Cadmium	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chromium (Total)[1]	mg/kg	2	9	5	12	7	5	3	5	4	9	8	18	5	11	11	11	8	12	7	9	19	21	5	7	11	11	24	19	10	6	11	12	5	22	7	3	8	6	16
	Copper	mg/kg	5	16	15	20	21	19	22	24	23	22	7	10	13	11	10	15	22	8	<5	6	9	12	8	11	<5	12	18	10	<5	9	14	11	<5	12	7	<5	27	14	14
	Lead	mg/kg	5	16	14	15	13	16	10	13	14	14	12	16	8	9	19	17	20	12	7	23	17	12	9	12	6	19	21	18	7	10	51	14	<5	14	8	<5	16	12	12
	Nickel	mg/kg	2	<2	<2	3	6	2	4	6	4	4	5	<2	<2	5	4	7	10	4	5	10	3	<2	<2	3	3	2	21	4	<2	<2	2	2	<2	6	2	<2	4	2	14
	Zinc	mg/kg	5	11	10	18	26	16	26	38	30	25	58	<5	6	13	29	55	138	25	12	45	42	<5	<5	32	6	8	76	16	<5	<5	9	8	<5	13	14	<5	54	27	106
	Mercury (Inorganic)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
PAH	Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluorene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Chrysene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Dibenz(a.h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(g.h.i)perylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total PAH (18)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
TRH	TRH C6-C9	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TRH C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	230	<100	<100	<100
	TRH C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	180	<100	<100	<100
	TRH C10-C36 Total	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	410	<50	<50	<50
	TRH C6-C10	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH C6-C10 minus BTEX (F1)	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	TRH >C10-C16 (F2)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	60	<50	<50	<50
	TRH >C16-C34 (F3)	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	320	<100	<100	<100
	TRH >C34-C40 (F4)	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	140	<100	<100	<100
	TRH C10-C40 Total (F bands)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	520	<50	<50	<50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	60	<50	<50	<50
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	m/p-xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	o-xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Total Xylenes	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
OCP	alpha-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Hexachlorobenzene (HCB)	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	beta-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	gamma-BHC - (Lindane)	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	delta-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Heptachlor	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Aldrin	mg/kg	0.5	0.12	0.08	0.45	0.67	0.29	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17
	Heptachlor epoxide	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.48	0.99	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Total Chlordane (sum)	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31	1.20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	trans-Chlordane	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31	1.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	alpha-Endosulfan	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	cis-Chlordane	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Dieldrin	mg/kg	0.1	0.1	0.12	0.35	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	4.4`-DDE	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	<0.05
	Endrin	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Endosulfan (sum)	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	beta-Endosulfan	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	4.4`-DDD	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Group	Analyte	Units	PQL	TP36-0.1-0.2 ES2522730 13 21/07/2025	TP37-0.1-0.2 ES2522730 12 21/07/2025	TP38-0.1-0.2 ES2522730 11 21/07/2025	TP39-0.1-0.2 ES2522730 10 21/07/2025	TP40-0.1-0.2 ES2522730 09 21/07/2025	TP41-0.1-0.2 ES2522730 08 21/07/2025	TP42-0.1-0.2 ES2522730 07 21/07/2025	TP43-0.1-0.2 ES2522730 06 21/07/2025	TP44-0.1-0.2 ES2522730 04 21/07/2025	TP44-1.1-1.2 ES2522730 05 21/07/2025	TP45-0.1-0.2 ES2522730 03 21/07/2025	TP46-0.1-0.2 ES2522730 02 21/07/2025	TP47-0.1-0.2 ES2522730 01 21/07/2025	DUP01 ES2509826 025 03/04/25	DUP01 ES2522730 29 21/07/2025	DUP02 ES2510979 028 15/04/25	DUP03 ES2509826 005 09/04/25	Site Adopted Criteria Residential A 0 m to <1 m | SAND		
																					Health Investigation / Screening Level (HIL / HSL)	Environmental Investigation / Screening Level (EIL / ESL)	Petroleum Hydrocarbon Management Level (PHML)
Metals	Arsenic	mg/kg	5	<5	10	8	10	11	9	6	8	<5	<5	<5	12	9	6	10	7	<5	100	100	-
	Cadmium	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	20	-	-
	Chromium (Total)[1]	mg/kg	2	13	20	13	18	26	10	8	10	11	9	8	17	32	13	16	13	7	100	400	-
	Copper	mg/kg	5	33	7	11	9	10	8	12	12	36	40	10	15	18	22	13	13	<5	6000	130	-
	Lead	mg/kg	5	37	13	13	12	19	10	8	9	16	21	26	23	16	28	12	21	<5	300	1100	-
	Nickel	mg/kg	2	8	4	2	4	<2	2	6	5	19	20	3	6	25	8	<2	4	<2	400	130	-
	Zinc	mg/kg	5	57	11	10	8	5	15	22	34	83	115	59	43	35	199	6	49	12	7400	720	-
	Mercury (Inorganic)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	40	-	-
PAH	Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Fluorene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Chrysene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	0.7	-
	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Dibenz(a.h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Benzo(g.h.i)perylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-
	Total PAH (18)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	300	-	-
	Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3	-	-
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	3	-	-
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	3	-	-
TRH	TRH C6-C9	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
	TRH C10-C14	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-
	TRH C15-C28	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-
	TRH C29-C36	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-
	TRH C10-C36 Total	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-
	TRH C6-C10	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
	TRH C6-C10 minus BTEX (F1)	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	45	-	-
	TRH >C10-C16 (F2)	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	-	120	1000
	TRH >C16-C34 (F3)	mg/kg	100	120	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	1300	3500
	TRH >C34-C40 (F4)	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	5600	10000
	TRH C10-C40 Total (F bands)	mg/kg	50	120	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-	-
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	-	-	-	110	-	-
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	0.5	65	-
	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	160	105	-
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	55	125	-
	m/p-xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
	o-xylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-
	Total Xylenes	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	40	45	-
OCP	alpha-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Hexachlorobenzene (HCB)	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	10	-	-
	beta-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	gamma-BHC - (Lindane)	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	delta-BHC	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Heptachlor	mg/kg	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	<0.05	-	-	-	-	6	-	-
	Aldrin	mg/kg	0.5	0.35	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.58	<0.05	-	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Total Chlordane (sum)	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.16	<0.05	-	-	-	-	50	-	-
	trans-Chlordane	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.16	<0.05	-	-	-	-	-	-	-
	alpha-Endosulfan	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	cis-Chlordane	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Dieldrin	mg/kg	0.1	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18	0.06	0.70	<0.05	-	-	-	-	-	-	-
	4.4`-DDE	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Endrin	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	10	-	-
	Endosulfan (sum)	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	270	-	-
	beta-Endosulfan	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	4.4`-DDD	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Endosulfan sulfate	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	4.4`-DDT	mg/kg	0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	300	-	-
	Sum of DDD + DDE + DDT	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	240	-	-
	Sum of Aldrin + Dieldrin	mg/kg	0.2	0.41	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18	0.06	1.28	<0.05	-	-	-	-	6	-	-
PCBs	Total PCBs	mg/kg	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	1	-	-

General Notes to Table: | - = Not Analysed | BTEX = Benzene, Toluene
| PCBs = Polychlorinated Biphenyls | PQL = Practical Quantification Lir
Notes to Statistical Calculations: The average and Standard Deviation
Additional Notes: [1] HIL limits are for Chromuium (VI) only, and EIL lim

Value	Highlighted concentration exceeds the site adopted criteri
Value	Highlighted concentration exceeds the site adopted criteri
Value	Highlight concentration exceeds the site adopted criteria (
Value	Highlighted concentration exceeds multiple site adopted c

Sample ID	Date Sampled	HIL A - FA/AF (% w/w)	HIL A - Bonded ACM (% w/w)	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC01-TP01-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP04-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP05-0.2-0.3	19/01/2024	0.001%	0.01%	Asbestos Detected	**0.00022%**	<0.01%	13600	-	-	-
AEC01-TP06-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC01-TP07-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP08-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC01-TP09-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC01-TP10-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC01-TP11-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP13-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC01-TP14-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC01-TP15-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC01-TP16-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC01-TP17-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00032%**	<0.01%	11500	25	3.75	**0.033%**
AEC01-TP18-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC01-TP19-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC01-TP20-0.2-0.3	19/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC01-TP21-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11800	-	-	-
AEC01-TP22-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC01-TP23-0.2-0.3	19/01//2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.058%**	12700	-	-	-
EBH2-01	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	14950	-	-	-
EBH2-02	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	16410	-	-	-
EBH2-03	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	12620	-	-	-
EBH2-04	28/10/2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.028%**	16880	-	-	-
EBH3-01	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	18340	-	-	-
EBH3-02	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	16210	-	-	-
EBH3-03	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	19450	-	-	-
EBH3-04	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	19240	-	-	-
EBH5-01	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	18360	-	-	-
EBH5-02	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	19530	-	-	-
EBH5-03	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	16170	-	-	-
EBH5-04	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	16750	-	-	-
BH39-01	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	14830	-	-	-
BH39-02	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	16150	-	-	-
BH39-03	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	13120	-	-	-
BH39-04	28/10/2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.024%**	18120	-	-	-
SS10-01	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	17650	-	-	-
SS10-02	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	13180	-	-	-
SS10-03	28/10/2024	0.001%	0.01%	Asbestos Detected	<0.001%	**0.036%**	19270	-	-	-
SS10-04	28/10/2024	0.001%	0.01%	-	<0.001%	<0.01%	13570	-	-	-
AEC02-TP01-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	130	19.5	**0.150%**
AEC02-TP02-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC02-TP03-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC02-TP04-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP05-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13300	-	-	-
AEC02-TP06-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	4	0.6	**0.004%**
AEC02-TP07-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-
AEC02-TP08-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP09-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP10-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP11-0.2-0.3	11/01/2024	0.001%	0.01%	Asbestos Detected	**0.00023%**	<0.01%	13000	321	48.15	**0.370%**
AEC02-TP12-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11300	-	-	-
AEC02-TP13-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP14-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP15-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP16-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC02-TP17-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC02-TP18-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP19-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13700	6	0.9	**0.007%**
AEC02-TP20-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12800	28	4.2	**0.033%**
AEC02-TP21-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12900	-	-	-
AEC02-TP22-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13400	3	0.45	**0.003%**
AEC02-TP23-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC02-TP24-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14400	-	-	-
AEC02-TP25-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP26-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-

Sample ID	Date Sampled	HIL A - FA/AF (% w/w)	HIL A - Bonded ACM (% w/w)	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC02-TP27-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	12600	27	4.05	**0.032%**
AEC02-TP28-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP29-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP30-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC02-TP31-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC02-TP32-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP33-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC02-TP34-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP35-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14000	3	0.45	**0.003%**
AEC02-TP36-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP37-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC02-TP38-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	10	1.5	**0.011%**
AEC02-TP39-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13000	16	2.4	**0.018%**
AEC02-TP40-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC02-TP41-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP42-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC02-TP43-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC02-TP44-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12000	-	-	-
AEC02-TP45-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP46-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15000	-	-	-
AEC02-TP47-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13800	276	41.4	**0.300%**
AEC02-TP48-0.2-0.3	12/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	18	2.7	**0.019%**
AEC02-TP49-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13400	-	-	-
AEC02-TP50-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	0.004%	13900	-	-	-
AEC02-TP51-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC02-TP52-0.2-0.3	12/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15100	-	-	-
AEC03-TP02-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP03-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12300	-	-	-
AEC03-TP04-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13500	-	-	-
AEC03-TP05-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP06-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP07-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP08-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11500	-	-	-
AEC03-TP09-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	15300	-	-	-
AEC03-TP10-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP12-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP18-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14700	-	-	-
TP19	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	66	9.9	**0.085%**
AEC03-TP20-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP21-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP22-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13700	-	-	-
AEC03-TP23-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP24-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP27-0.2-0.3	9/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13600	-	-	-
AEC03-TP28-0.2-0.3	9/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	16400	209	31.35	**0.191%**
AEC03-TP29-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14600	-	-	-
AEC03-TP30-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP32-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13000	-	-	-
AEC03-TP33-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP34-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP35-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP39-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14200	-	-	-
AEC03-TP40-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP41-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP42-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	11700	5	0.75	**0.006%**
AEC03-TP43-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP44-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14800	-	-	-
AEC03-TP57-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14500	51	7.65	**0.053%**
AEC03-TP58-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	11000	-	-	-
AEC03-TP60-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP61-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12700	-	-	-
AEC03-TP62-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14500	-	-	-
AEC03-TP63-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP64-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP66-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13800	-	-	-
AEC03-TP67-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13100	-	-	-

Sample ID	Date Sampled	HIL A - FA/AF (% w/w)	HIL A - Bonded ACM (% w/w)	Laboratory Results	Laboratory Results		On-site gravimetric results			
				Asbestos Detected/ Non-Detected	Percentage of AF/FA <7mm, %w/w	Percentage of Bonded ACM >7mm (500ml), %w/w	Weight of Sample (10L), g	Onsite weight of ACM fragment >7mm, g	Asbestos	Percentage of Bonded ACM >7mm (10L), %w/w
AEC03-TP68-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13500	310	46.5	**0.344%**
AEC03-TP70-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	14600	152	22.8	**0.156%**
AEC03-TP71-0.2-0.3	10/01/2024	0.001%	0.01%	Asbestos Detected	<0.001%	<0.01%	13100	2	0.3	**0.002%**
AEC03-TP72-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12200	-	-	-
AEC03-TP73-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14000	-	-	-
AEC03-TP75-0.2-0.3	10/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-
AEC03-TP76-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14900	-	-	-
AEC03-TP77-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12800	-	-	-
AEC03-TP78-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	14100	-	-	-
AEC03-TP79-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12500	-	-	-
AEC03-TP80-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	13200	-	-	-
AEC03-TP84-0.2-0.3	11/01/2024	0.001%	0.01%	-	<0.001%	<0.01%	12600	-	-	-

Legend

	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 AF/FA
	Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPM ASC 2013 Bonded ACM
ACM	Asbestos Containing Material
FA and AF	Fibrous Asbestos and Asbestos Fines
NL	Not Limiting
-	Detected at below the limit of reporting

		Group	Asbestos					
		Analyte	Asbestos Sample Mass/Dimensions	Asbestos Sample Description	AF	FA	FA + AF	ACM
		Units	-	-	% w/w	% w/w	% w/w	% w/w
		PQL	-	-	0.01	0.01	0.01	0.01
Sample ID	Reference / Sample Date			# Samples	84	84	84	84
				# Detects	0	0	0	0
				Minimum	0	0	0	0
				Average	NC	NC	NC	NC
				Standard Deviation	NC	NC	NC	NC
				Maximum	ND	ND	ND	ND
TP01-0.1-0.2	ES2510979022 15/04/25		154	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP02-0.1-0.2	ES2510979023 15/04/25		104	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP03-0.1-0.2	ES2509826003 03/04/25		138	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP04-0.1-0.2	ES2509826004 03/04/25		131	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP05-0.1-0.2	ES2509826005 03/04/25		133	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP07-0.1-0.2	ES2510979016 15/04/25		71	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP07-1.0-1.1	ES2510979017 15/04/25		62	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP07-2.0-2.1	ES2510979018 15/04/25		63	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP08-0.1-0.2	ES2510979019 15/04/25		56	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP08-1.0-1.1	ES2510979020 15/04/25		56	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP08-2.0-2.1	ES2509826001 03/04/25		72	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP09-0.1-0.2	ES2509826002 03/04/25		53	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP09-0.2-0.3	ES2510979021 15/04/25		44	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP10-0.1-0.2	ES2509826007 03/04/25		74	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP10-1.0-1.1	ES2509826008 03/04/25		64	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP10-2.0-2.1	ES2509826009 03/04/25		62	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP11-0.1-0.2	ES2509826010 03/04/25		45	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP11-0.4-0.5	ES2509826011 03/04/25		50	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP12-0.1-0.2	ES2509826012 03/04/25		58	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP12-0.9-1.0	ES2509826013 03/04/25		55	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP13-0.1-0.2	ES2509826014 03/04/25		57	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP13-0.3-0.4	ES2509826015 03/04/25		48	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP13-0.6-0.7	ES2509826016 03/04/25		44	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP13-1.5-1.6	ES2509826017 03/04/25		57	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP14-0.1-0.2	ES2509826018 03/04/25		84	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP14-0.4-0.5	ES2509826019 03/04/25		50	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP14-0.8-0.9	ES2509826020 03/04/25		39	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP15-0.1-0.2	ES2509826021 03/04/25		47	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP15-0.4-0.5	ES2509826022 03/04/25		58	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP15-0.6-0.7	ES2510979001 15/04/25		59	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP15-0.9-1.0	ES2510979002 15/04/25		53	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP16-0.1-0.2	ES2510979003 15/04/25		52	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP16-0.4-0.5	ES2510979004 15/04/25		48	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP17-0.1-0.2	ES2510979005 15/04/25		43	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP17-1.0-1.1	ES2510979006 15/04/25		49	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP17-2.0-2.1	ES2510979007 15/04/25		41	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP18-0.1-0.2	ES2510979008 15/04/25		69	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP18_1.0-1.1	ES2510979009 15/04/25		59	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP18-2.0-2.1	ES2512173001 29/04/25		71	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP19-0.1-0.2	ES2510979010 15/04/25		72	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP19-1.0-1.1	ES2510979011 15/04/25		62	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP19-2.0-2.1	ES2510979012 15/04/25		76	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP20-0.1-0.2	ES2510979013 15/04/25		110	A soil sample.	<0.01	<0.01	<0.01	<0.01

		Group	Asbestos					
		Analyte	Asbestos Sample Mass/Dimensions	Asbestos Sample Description	AF	FA	FA + AF	ACM
		Units	-	-	% w/w	% w/w	% w/w	% w/w
		PQL	-	-	0.01	0.01	0.01	0.01
TP20-1.0-1.1	ES2510979014 15/04/25		44	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP20-2.0-2.1	ES2510979024 15/04/25		88	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP21-0-0.1	ES2510979025 15/04/25		185	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP22-1.1-1.2	ES252522273027 21/07/25		53	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP22-0.1-0.2	ES252522273026 21/07/25		57	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP23-0.1-0.2	ES252522273025 21/07/25		64	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP24-0.1-0.2	ES252522273024 21/07/25		68	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP25-0.1-0.2	ES2510979026 15/04/25		80	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP25-0.2-0.3	ES2510979027 15/04/25		68	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP25-0.4-0.5	ES2510322001 09/04/25		51	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP25-1.0-1.1	ES2510322002 09/04/25		38	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP25-2.0-2.1	ES2509826025 03/04/25		50	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP26-0.1-0.2	ES252522273018 21/07/25		59	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP26-1.1-1.2	ES252522273018 21/07/25		75	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP27-0.1-0.2	ES252522273022 21/07/25		59	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP28-0.1-0.2	ES2510979024 15/04/25		56	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP28-0.3-0.4	ES2510979025 15/04/25		82	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP28-1.0-1.1	ES2510979026 15/04/25		43	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP28-2.0-2.1	ES2510979027 15/04/25		54	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP29-0.1-0.2	ES2510322022 09/04/25		61	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP30-0.1-0.2	ES2510322020 21/07/25		71	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP30-1.1-1.2	ES2510322021 21/07/25		52	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP31-0.1-0.2	ES2510322019 21/07/25		61	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP32-0.1-0.2	ES2510322001 09/04/25		79	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP32-0.5-0.6	ES2510322002 09/04/25		109	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP33-0.1-0.2	ES2522273016 21/07/2025		37	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP34-0.1-0.2	ES2522273015 21/07/2025		50	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP35-0.1-0.2	ES2522273014 21/07/2025		62	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP36-0.1-0.2	ES2522273013 21/07/2025		62	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP37-0.1-0.2	ES2522273012 21/07/2025		70	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP38-0.1-0.2	ES2522273011 21/07/2025		61	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP39-0.1-0.2	ES2522273010 21/07/2025		51	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP40-0.1-0.2	ES2522273009 21/07/2025		60	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP41-0.1-0.2	ES2522273008 21/07/2025		73	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP42-0.1-0.2	ES2522273007 21/07/2025		61	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP43-0.1-0.2	ES2522273006 21/07/2025		52	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP44-0.1-0.2	ES2522273004 21/07/2025		55	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP44-1.1-1.2	ES2522273005 21/07/2025		56	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP45-0.1-0.2	ES2522273003 21/07/2025		72	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP46-0.1-0.2	ES2522273002 21/07/2025		74	A soil sample.	<0.01	<0.01	<0.01	<0.01
TP47-0.1-0.2	ES2522273001 21/07/2025		65	A soil sample.	<0.01	<0.01	<0.01	<0.01

General Notes to Table: | - = Not Analysed | ACM = Asbestos Containing Material | AF = Asbestos Fines | FA = Fibrous Asbestos | NC = Not Calculated | ND = Non-Detect |
| NL = Not Limiting |PQL = Practical Quantification Limit

Notes to Statistical Calculations: The Average and Standard Deviation are calculated with non-detects replaced with a null (0) proxy value. Where all values are non-detect, a "NC" value is ouputted.

Value Highlighted concentration exceeds the site adopted criteria (HIL)

	Sample ID				TP11-0.4-0.5	DUP01	RPD Limit	RPD	TP11-0.4-0.5	DUP01A	RPD Limit	RPD	TP47-0.1-0.2	DUP01	RPD Limit	RPD	TP47-0.1-0.2	DUP01A	RPD Limit	RPD	TP10-0.1-0.2	DUP02	RPD Limit	RPD	TP10-0.1-0.2	DUP02A	RPD Limit	RPD	TP01-0.1-0.2	DUP03	RPD Limit	RPD	TP01-0.1-0.2	DUP03A	RPD Limit	RPD
	Reference /Sample Date				ES2509826011 03/04/25	ES2509826025 03/04/25			ES2509826011 03/04/25	S25-Ap0021453 03/04/2025			ES2522273001 21/07/2025	ES2522273029 21/07/2025			ES2522273001 21/07/2025	S25-I0068869 21/07/25			ES2510979021 15/04/25	ES2510979028 15/04/25			ES2510979021 15/04/25	S25-Ap0061817 15/04/2025			ES2513733001 09/05/25	ES2509826005 09/05/25			ES2513733001 09/05/25	S25-My0041895 09/05/2025		
Group	Analyte	Units	Eurofins PQL	ALS PQL																																
Metals	Arsenic	mg/kg	2	5	9	6	NL	40	9	8.6	NL	5	9	10	NL	11	9	8	NL	12	8	7	NL	13	8	9	NL	14	<5	<5	NL	NC	<5	<2	NL	NC
	Cadmium	mg/kg	0.4	1	<1	<1	NL	NC	<1	< 0.4	NL	NC	<1	<1	NL	NC	<1	<1	NL	NC	<1	<1	NL	NC	<1	< 0.4	NL	NC	<1	<1	NL	NC	<1	<0.4	NL	NC
	Chromium (Total)	mg/kg	5	2	17	13	NL	27	17	15	NL	13	32	16	NL	67	32	16	NL	67	13	13	NL	0	13	13	NL	0	8	7	NL	13	8	9	NL	14
	Copper	mg/kg	5	5	16	22	NL	32	16	15	NL	6	18	13	NL	32	18	18	NL	0	15	13	NL	14	15	13	NL	14	<5	<5	NL	NC	<5	<5	NL	NC
	Lead	mg/kg	5	5	29	28	NL	4	29	20	NL	37	16	12	NL	29	16	14	NL	13	22	21	NL	5	22	20	NL	10	5	<5	NL	NC	5	6	NL	15
	Nickel	mg/kg	5	5	5	8	NL	46	5	<5	NL	NC	25	<2	NL	NC	25	7	NL	113	4	4	NL	0	4	< 5	NL	NC	<2	<2	NL	NC	<2	<5	NL	NC
	Zinc	mg/kg	5	0.1	61	199	50	106	61	39	50	44	35	6	NL	141	35	27	NL	26	54	49	50	10	54	47	50	14	18	12	NL	40	18	13	NL	32
	Mercury (Inorganic)	mg/kg	0.1	2	<0.1	<0.1	NL	NC	<0.1	<0.1	NL	NC	<0.1	<0.1	NL	NC	<0.1	<0.1	NL	NC	<0.1	<0.1	NL	NC	<0.1	< 0.1	NL	NC	<0.1	<0.1	NL	NC	<0.1	<0.1	NL	NC
PAH	Naphthalene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Acenaphthylene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Acenaphthene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Fluorene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Phenanthrene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Anthracene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Fluoranthene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Pyrene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benz(a)anthracene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Chrysene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(b+j)fluoranthene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(k)fluoranthene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(a)pyrene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Indeno(1.2.3.cd)pyrene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Dibenz(a.h)anthracene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(g.h.i)perylene	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Total PAH (18)	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	0.5	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	< 0.5	NL	NC	<0.5	<0.5	NL	NC	<0.5	<0.5	NL	NC
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.6	0.5	0.6	0.6	NL	NC	1	0.6	NL	NC	0.6	0.6	NL	NC	1	0.6	NL	NC	1	1	NL	NC	0.6	1	NL	NC	1	1	NL	NC	1	1	NL	NC
	Benzo(a)pyrene TEQ (LOR)	mg/kg	1.2	0.5	1.2	1.2	NL	NC	1	1.2	NL	NC	1.2	1.2	NL	NC	1	1.2	NL	NC	1	1	NL	NC	1.2	1	NL	NC	1	1	NL	NC	1	1	NL	NC

General Notes to Table: | - = Not Analysed | NC = Not Calculated | ND = Non-Detect | PAH = Polyaromatic Hydrocarbon |

| PQL = Practical Quantification Limit | RPD = Relative Percentage Difference | TEQ = Toxicity Equivalence Quotient |

Notes to RPD limits: Limits vary according based on a comparison of the parent sample concentration and the PQL for each analyte.

The following RPD limits apply: analyte concentration < 10x PQL: No RPD limit; > 10x < 20x PQL, 50% RPD limit; > 20x PQL, 30% RPD limit.

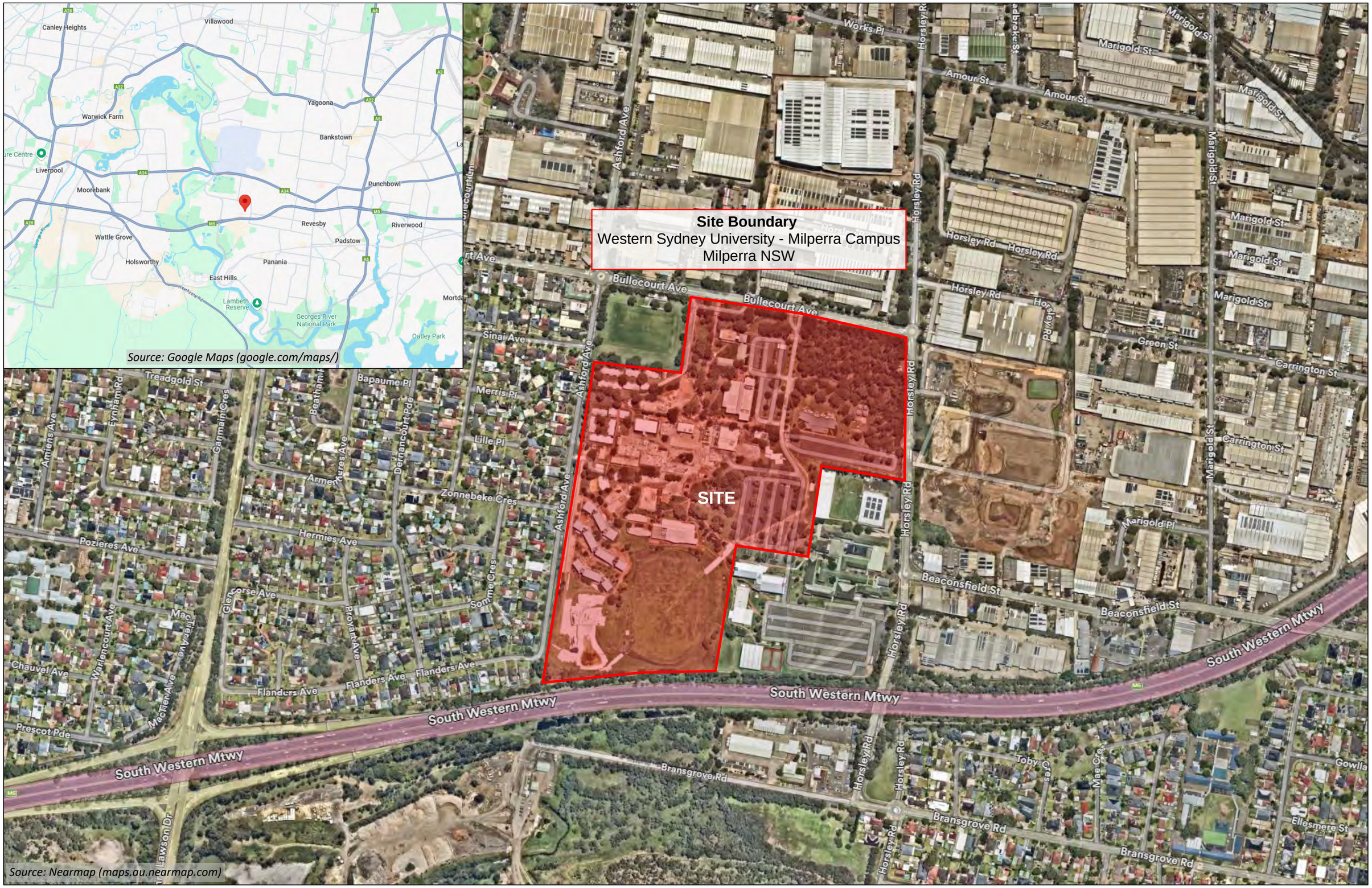
Value Highlighted value exceeds the site adopted RPD criteria

	TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK	TRIP SPIKE	TRIP BLANK	TRIP SPIKE	Trip Blank
	ES2513733007	ES2513733008	ES2510979029	ES2510979030	ES2512173002	ES2512173003	ES2510322003	ES2510322004	ES2509826023	ES2509826024	ES2522273031	ES2522273032
	05/05/2025	02/05/2025	07/04/2025	07/04/2025	28/04/2025	28/04/2025	07/04/2025	07/04/2025	31/03/2025	03/04/2025	14/07/2025	14/07/2025
	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Recovery (%)	**Concentration**	**Recovery (%)**	**Concentration**	**Recovery (%)**	**Concentration**	**Recovery (%)**	**Concentration**	**Recovery (%)**	**Concentration**	**Recovery (%)**	**Concentration**
Analyte	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg	%	mg/kg
Benzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toulene	97	<0.5	113	<0.5	75	<0.5	72	<0.5	80	<0.5	91	<0.5
Ethylbenzene	89	<0.5	125	<0.5	76	<0.5	69	<0.5	83	<0.5	90	<0.5
m/p-Xylene	96	<0.5	116	<0.2	76	<0.2	71	<0.2	82	<0.2	90	<0.2
o-Xylene	<1	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	89	<1
Total Xylenes	99	<0.5	113	<0.5	76	<0.5	71	<0.5	82	<0.5	90	<0.5

Value **Value outside assessment criteria**

EGA (October 2025)

Demolition Clearance Report



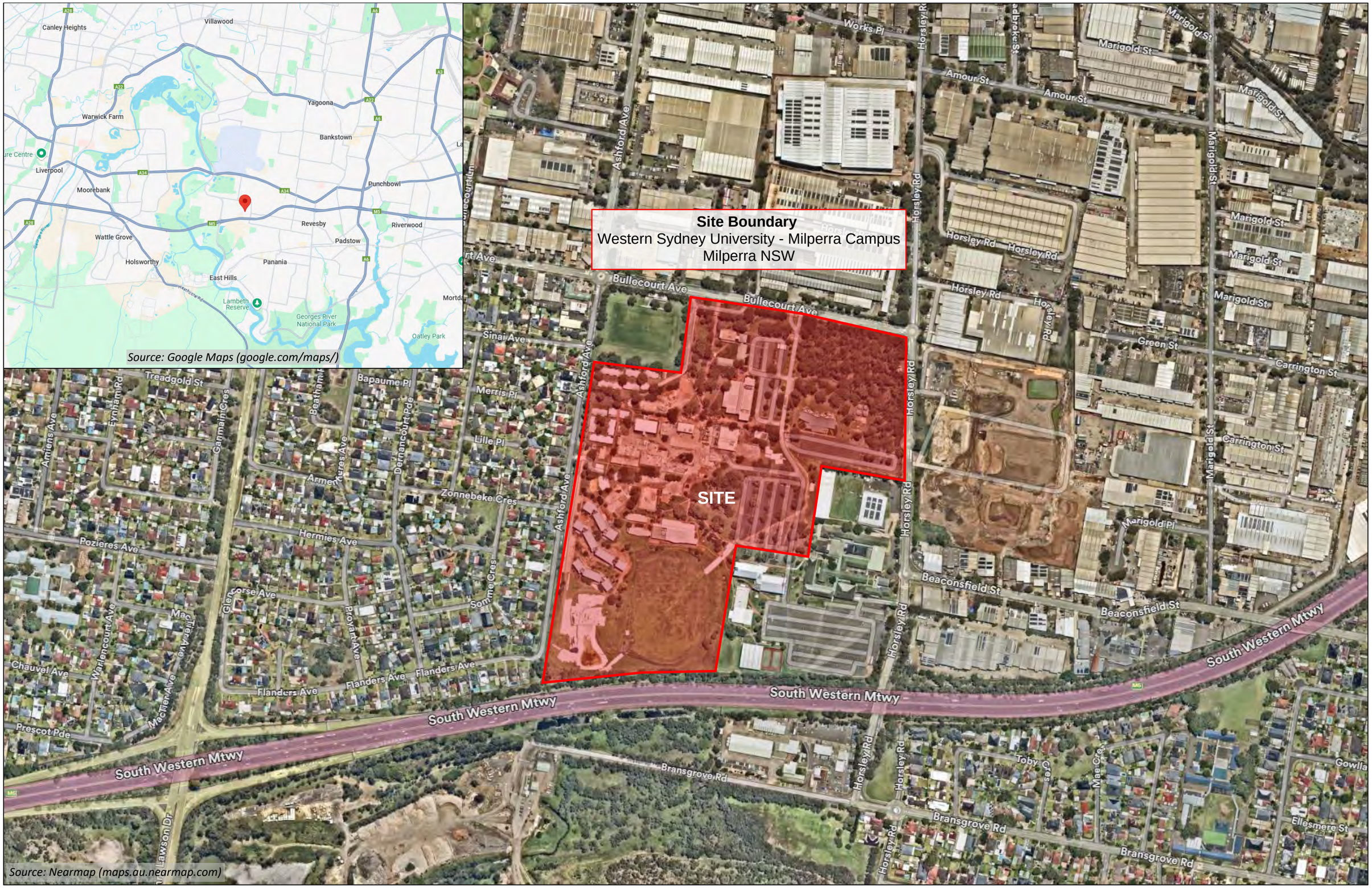
Scale :	150 m	Site Locality		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	1
Project Name:	Demolition Clearance Report		Figure Date:	16 July 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-LTR-05-160725.v1f



Scale :	65 m	Site Layout		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	2
Project Name:	Demolition Clearance Report		Figure Date:	16 July 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-LTR-01-160725.v1f

EGA (October 2025)

Post Demolition RAP



Scale :	150 m	Site Locality		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	1
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f

LEGEND

- Site Boundary
- **AEC01** - Friable Asbestos Impacted Soils (EBH1)
- **AEC01 -** Non-friable Asbestos Impacted Soils
- **AEC01a** - Lead, Cadmium and Zinc Impacted Soils
- **AEC02** - Non-Friable Asbestos Impacted Soils
- **AEC03** - Asbestos Impacted Soils and Potential Asbestos Impacted Soil
- **PAEC04** - Former Underground Storage Tank
- **AEC05** - Non-friable asbestos impacted shallow fill soils
- Further Sampling Required in-line with updated RAP
- Environmental Conservation Zone

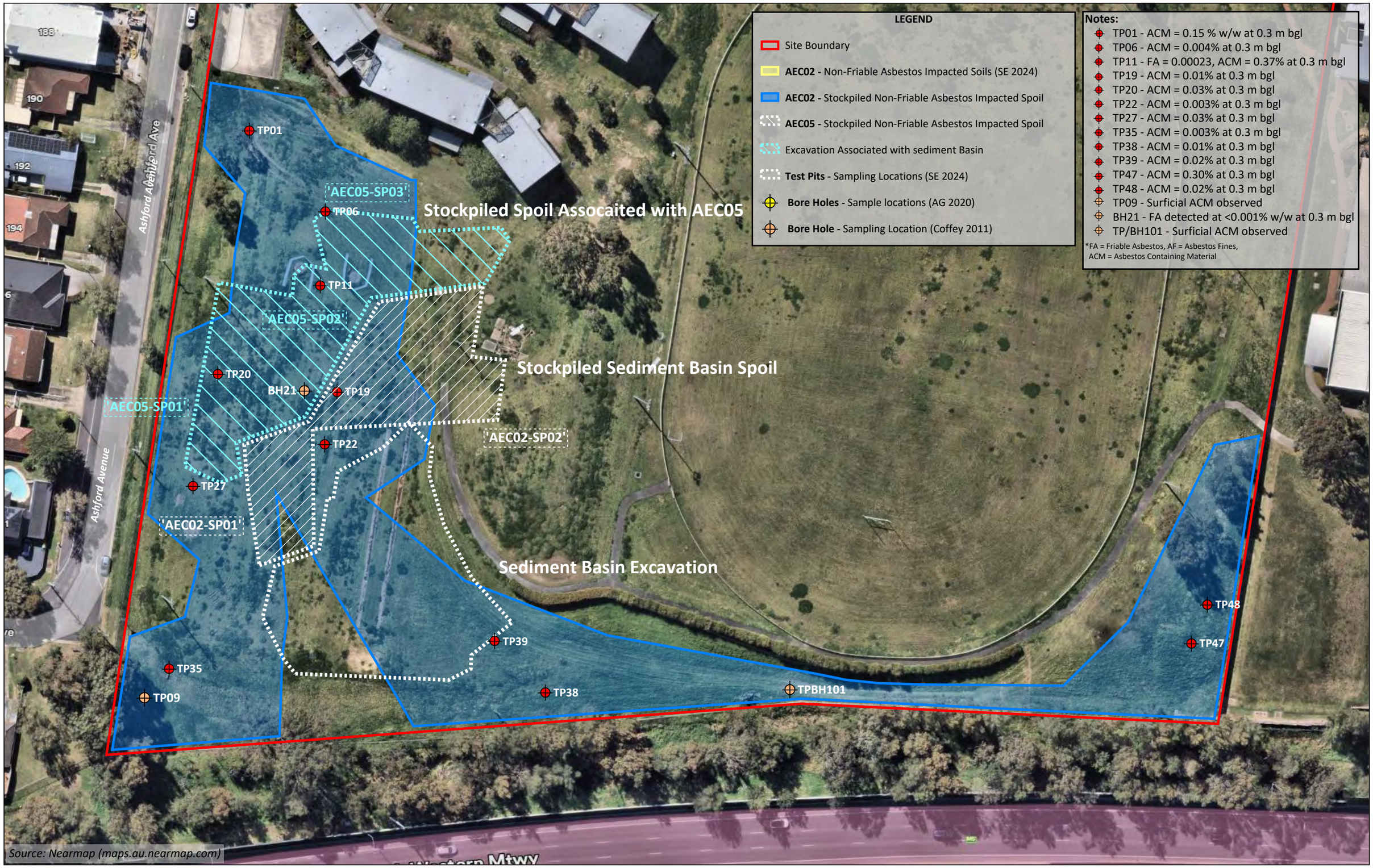
Horsley Rd
Mount St Joseph Catholic College, Horsley Rd
Horsley Rd After Beaconsfield St
South Western Mtwy
Brransgrove Rd
Bullecourt Ave
Western Sydney University, Bullecourt Av
Ashford Village And Bp Service Station
Ashford Ave

Source: Nearmap (maps.au.nearmap.com)

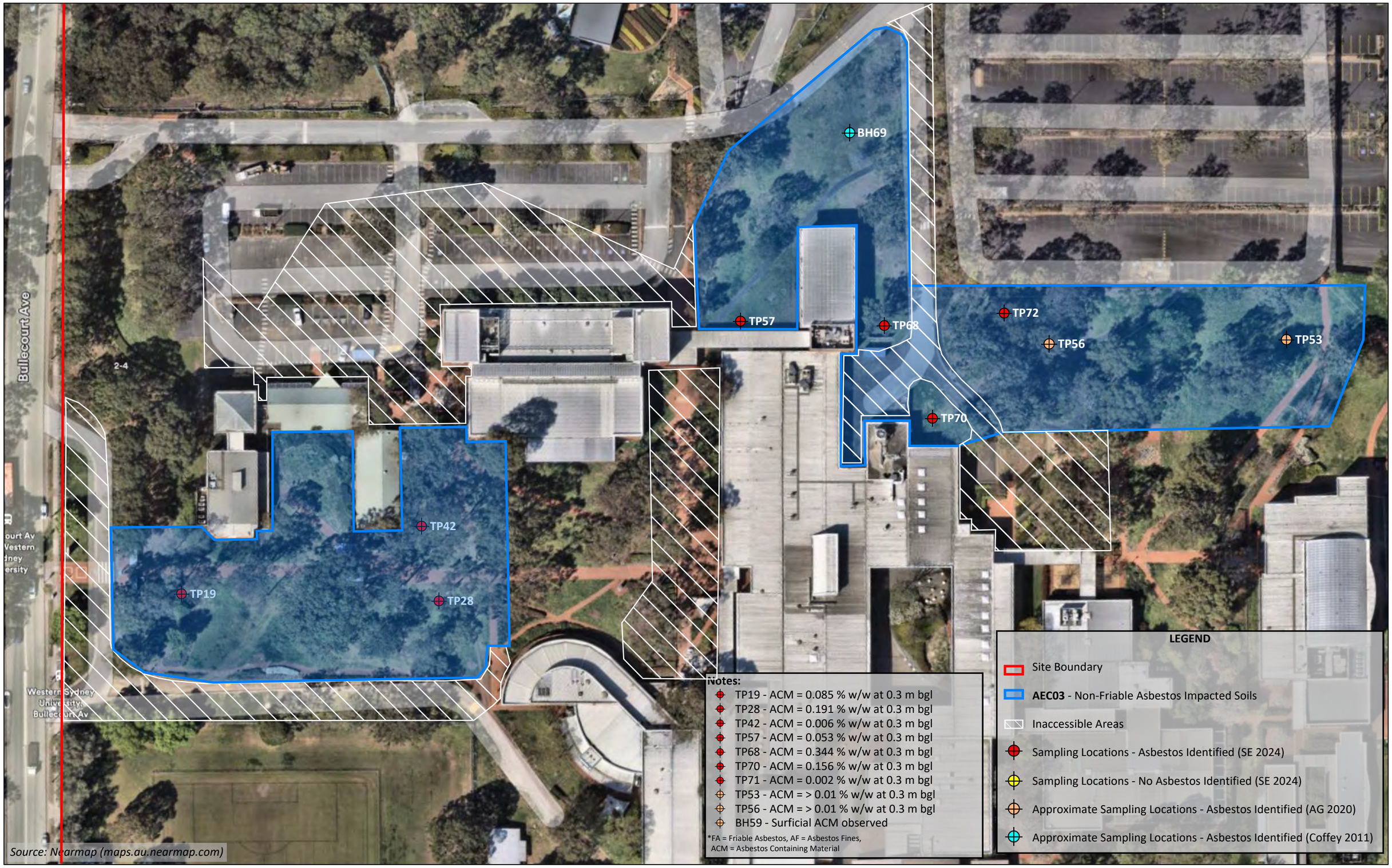
Scale :	62 m	Areas of Environmental Concern		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	2
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-ARAP-01-300924.v1f



Scale :	15 m	Approximate Remedial Extents - AEC01	
Client Name:	Mirvac Pty Ltd	Figure Number:	3
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



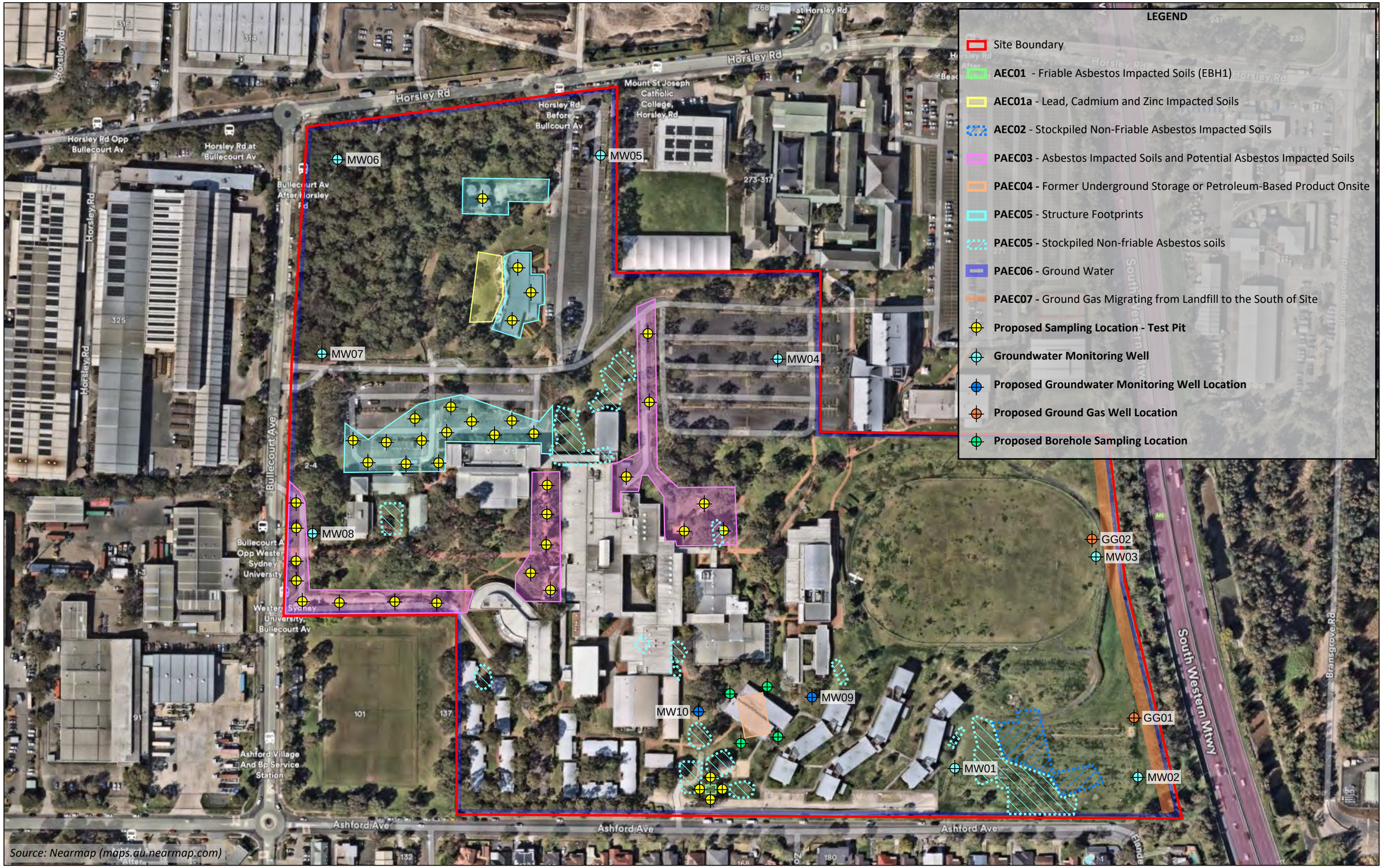
Scale :	21 m	Approximate Remedial Extents - AEC02		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	4
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f



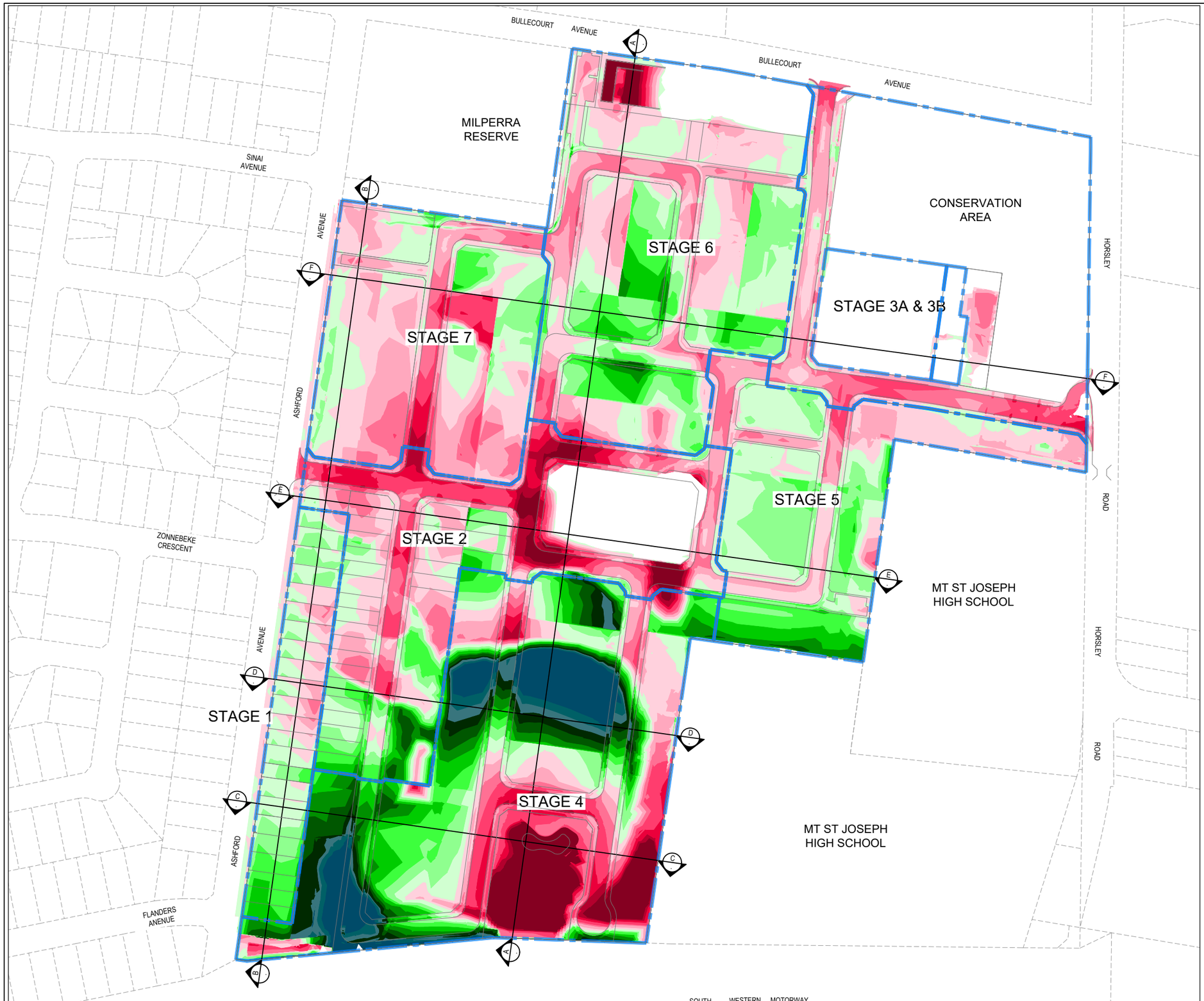
Scale :	25 m	Approximate Remedial Extents - AEC03	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



Scale :	50 m	Approximate Remedial Extents - AEC05	
Client Name:	Mirvac Pty Ltd	Figure Number:	6
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



Scale :	65 m	Proposed Supplementary Sampling Locations		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	7
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f



CUT AND FILL LEGEND

DEPTH RANGE (m)		COLOUR
>1.8m CUT		
-1.8	-1.5	
-1.5	-1.2	
-1.2	-0.9	
-0.9	-0.6	
-0.6	-0.3	
-0.3	0.0	
0.0	0.3	
0.3	0.6	
0.6	0.9	
0.9	1.2	
1.2	1.5	
1.5	1.8	
1.8	2.1	
2.1	2.4	
2.4	2.7	
>2.7m FILL		

APPROXIMATE EARTHWORKS VOLUMES:

CUT - 55,502m³
FILL - 60,584m³

BALANCE - 5,082m³ OF FILL

* THIS ESTIMATE IS BASED ON POST DEMOLITION EXISTING SURFACE TO BOXING DESIGN SURFACE

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works

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C	ISSUED FOR REVIEW	28.08.25	GN	SG
B	ISSUED FOR REVIEW	18.08.25	GN	SG
A	ISSUED FOR PRELIMINARY REVIEW	08.08.25	GN	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	-
Date	-
Approved	-
Reg. No.	-
Date	-
DA Number	DA1000

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
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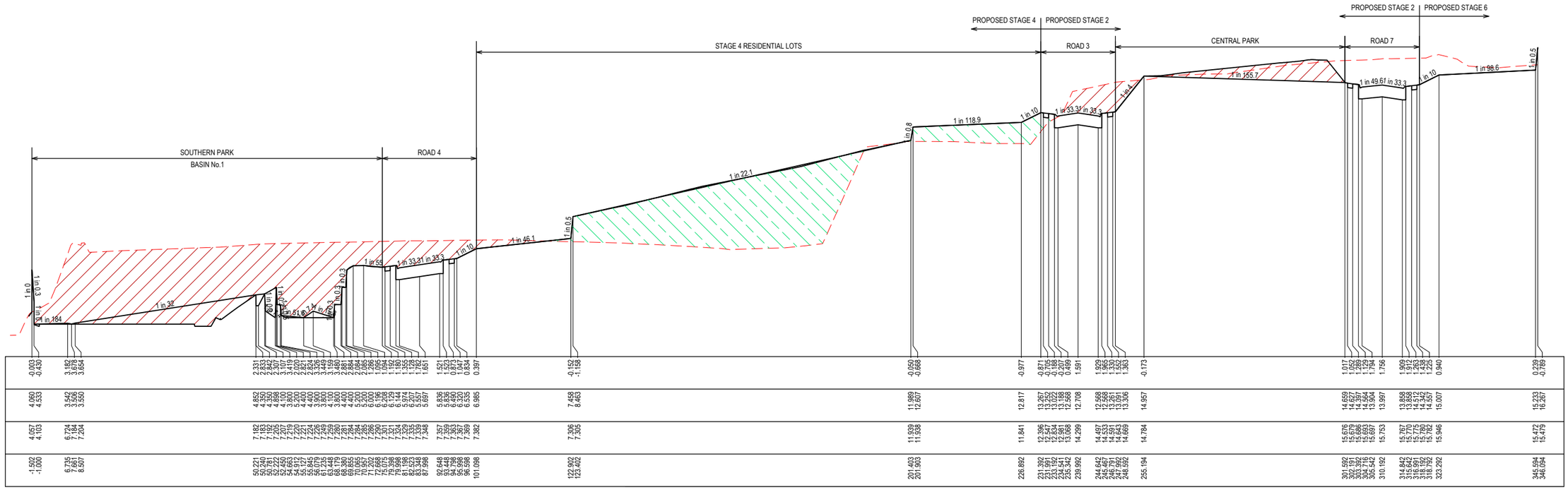
Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	BULK EARTHWORKS OVERALL PLAN

Sheet 30 of 145
Scale 1:1250 @ A1

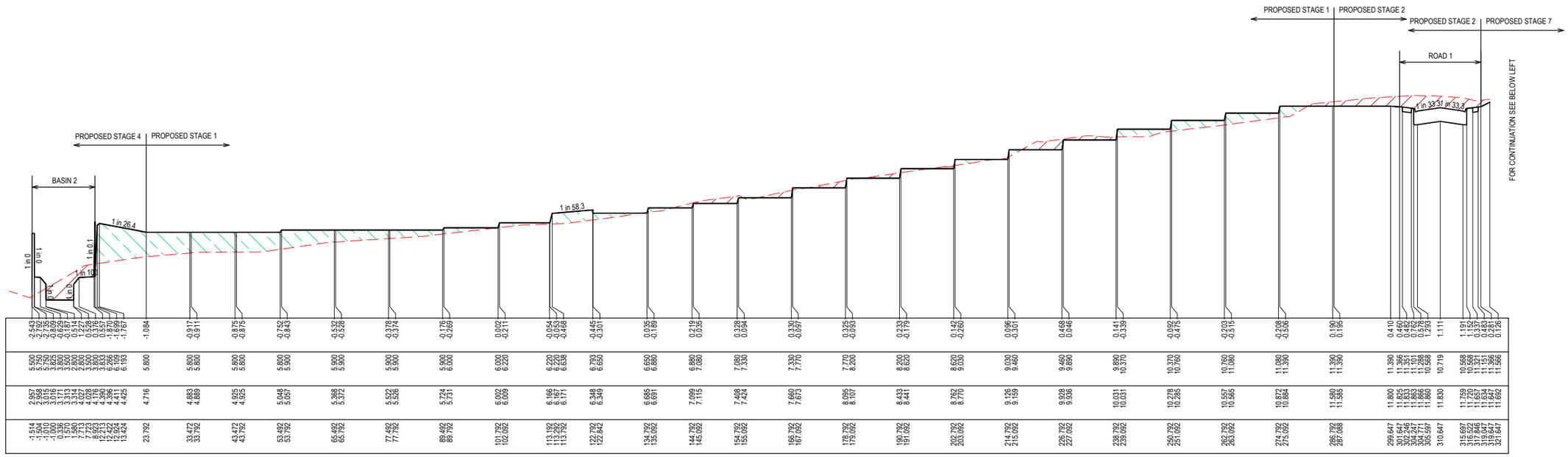
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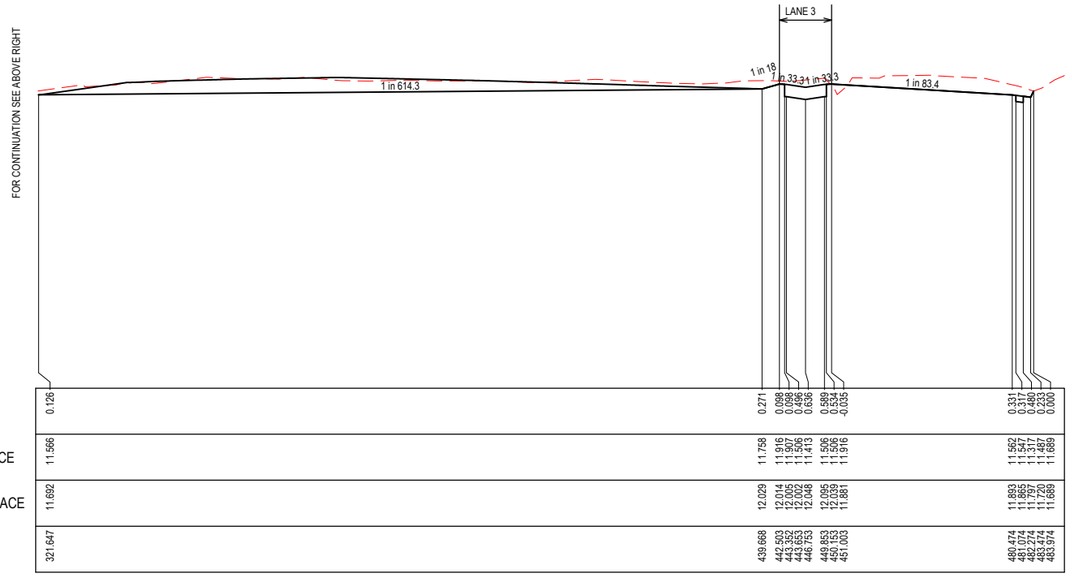
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PROPOSED STAGE 4
PROPOSED STAGE 2
PROPOSED STAGE 2
PROPOSED STAGE 6
STAGE 4 RESIDENTIAL LOTS
ROAD 3
CENTRAL PARK
ROAD 7
SOUTHERN PARK
BASIN No.1
ROAD 4
1 in 0
1 in 0.3
1 in 184
1 in 32
1 in 0.3
1 in 0.3
1 in 0.3
1 in 51.6
1 in 55
1 in 33.31 in 33.3
1 in 10
1 in 46.1
1 in 0.5
1 in 22.1
1 in 0.8
1 in 118.9
1 in 10
1 in 33.31 in 33.3
1 in 155.7
1 in 49.61 in 33.3
1 in 10
1 in 98.6
1 in 0.5

| | | |





LEGEND
- EXISTING SURFACE
- DESIGN LINE
- FILL HATCH
- CUT HATCH

SECTION B-B
CROSS SECTIONS

WARNING
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HORIZ 1:500 0 5 10 20 30
VERT 1:100 0 1 2 4 6
SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	-
Date	-
Approved	-
Reg. No.	-
Date	-
DA Number	DA1000

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Development & Infrastructure Consultants
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Oran Park NSW 2570
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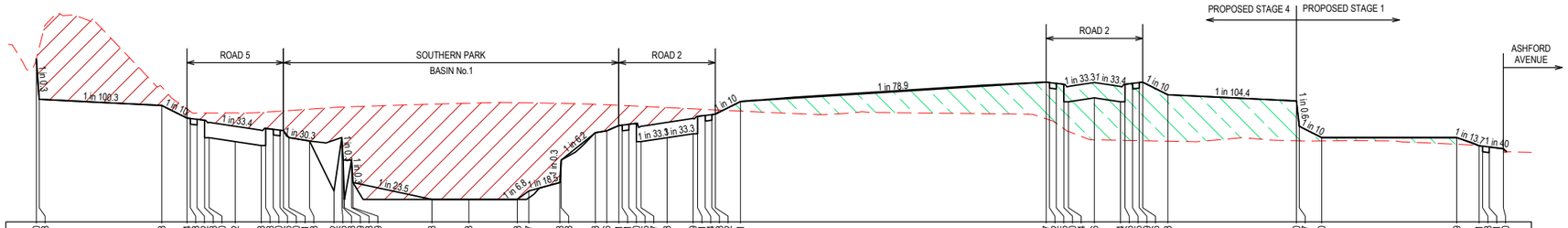
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: BULK EARTHWORKS
SECTION B

Sheet 32 of 145
Scale 1:500 H 1:100 V @ A1

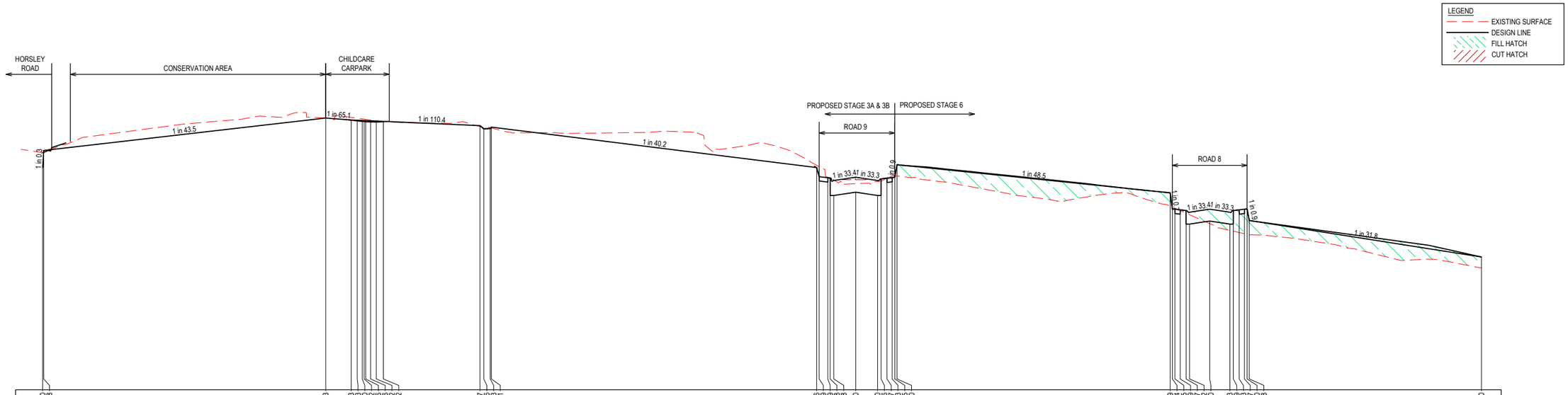
Project Ref	Stage No	Drawing No	Rev
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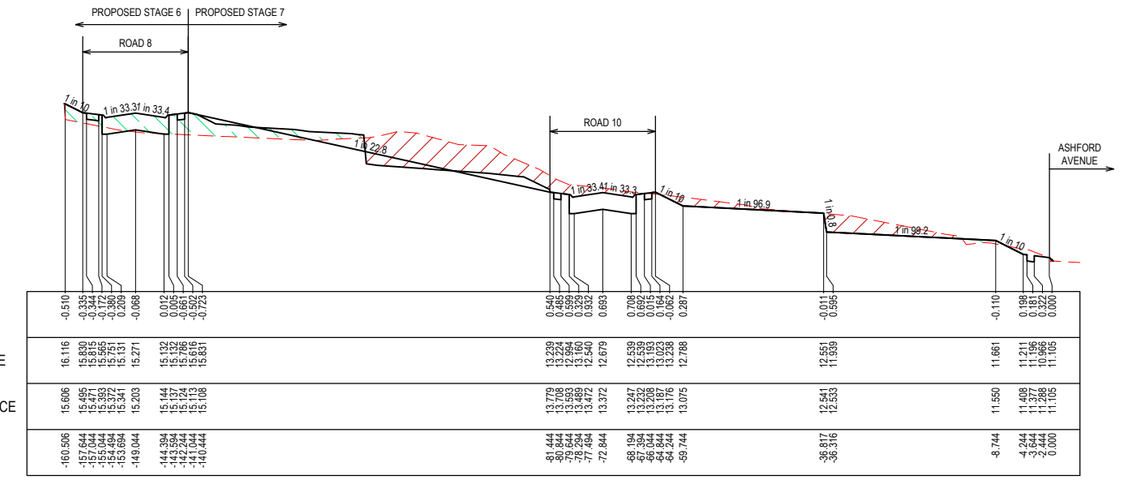
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LEGEND
- EXISTING SURFACE
- DESIGN LINE
- FILL HATCH
- CUT HATCH

| | | |





SECTION F-F
CROSS SECTIONS

WARNING
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B	ISSUED FOR REVIEW	18.08.25	GN	SG
A	ISSUED FOR PRELIMINARY REVIEW	08.08.25	GN	SG

HORIZ 1:500 0 5 10 20 30
VERT 1:100 0 1 2 4 6
SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	-
Date	-
Approved	-
Reg. No.	-
Date	-
DA Number	DA1000

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: BULK EARTHWORKS
SECTION F

Sheet 34 of 145
Scale 1:500 H 1:100 V @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	320	074	C

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Development Plans for Residential Subdivision



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve Lots	Stage Area (m²)
Stage 1	2	22	0	8435
Stage 2	4	40	0	29526
Stage 3A & 3B	1	0	1	35658
Stage 4	8	107	2	44398
Stage 5	6	63	0	20734
Stage 6	9	92	1	35400
Stage 7	6	59	0	22247

KEY NOTES

THE DEVELOPMENT WILL BE CONSTRUCTED AND DELIVERED IN 7 DISTINCT STAGES, HOWEVER, THE SEQUENCING OF THESE STAGES IS IMMATERIAL AS THE STAGING IS INTENDED TO BE INTERCHANGEABLE, DUE TO VARYING CONSTRUCTION TIMEFRAMES AND POTENTIAL OBSTACLES ENCOUNTERED WHILST ON SITE. STAGING SEQUENCING WILL BE AS PER THE FOLLOWING:

1. STAGE 1 IS INTENDED TO COMMENCE FIRST.
2. STAGES 2 OR 3A WILL COMMENCE SECOND AND BE DELIVERED PRIOR, CONCURRENTLY OR AFTER EACH OTHER. FOR EXAMPLE, STAGE 3A CAN COMMENCE PRIOR, CONCURRENTLY OR AFTER STAGE 2 AS THEY ARE INDEPENDENT.
3. STAGE 3B CANNOT OCCUR PRIOR TO STAGE 3A, BUT DOES NOT HAVE TO BE DELIVERED BEFORE STAGES 2, 4, 5, 6 AND STAGE 7.
4. STAGE 4 CANNOT BE DELIVERED PRIOR TO STAGE 2, BUT CAN BE DELIVERED PRIOR TO STAGE 3A.
5. STAGE 5 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A AND STAGE 4.
6. STAGE 6 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A, 4 AND STAGE 5.
7. STAGE 7 CANNOT BE DELIVERED PRIOR TO STAGE 2, 4 AND STAGE 6.

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REV	DESCRIPTION	DATE	DRN.	APP.
F	REVISED STAGING ADDITION OF STAGE 6	09.08.24	AA	S.G.
E	STAGE 4 & 5 BOUNDARY MODIFIED	13.06.24	S.G.	S.G.
D	LAYOUT MODIFIED	23.05.24	S.G.	S.G.
C	STAGE 1 BOUNDARIES	31.01.24	S.G.	S.G.
B	STAGE 1 LIMITS UPDATED	22.01.24	S.G.	S.G.

REV	DESCRIPTION	DATE	DRN.	APP.
N	LOT NUMBERS ADDED	24.07.25	R.M	J.G
M	SUPERLOT EXTENTS UPDATED	03.07.25	R.M	J.G
L	STAGING EXTENTS UPDATED	01.07.25	R.M	S.G
K	SUPERLOT 32 BOUNDARIES AMENDED	12.05.25	S.G.	J.G.
J	LOT NUMBERING & SUPERLOT BOUNDARIES 30, 31, 33 & 35 AMENDED	14.03.25	S.G.	J.G.
I	UPDATE TO STAGE 3 BOUNDARIES & LOT NUMBERS ADDED	13.03.25	S.G.	J.G.
H	UPDATE TO BASIN 2 LOT BOUNDARIES	19.12.24	AA	J.G
G	REVISED STAGING ADDITION OF COMMERCIAL AREA	29.08.24	AA	S.G.

mirvac

0 15 30 60 90 120
SCALE 1:1500 AT A1 SIZE

Designed	S. GRAY
Date	15.01.2024
Drawn	D. HALL
Approved	N/A
Date	N/A
DA Number	N/A

Beveridge Williams
Development & Infrastructure Consultants
32 Iolanthe Street
Campbelltown, NSW 2560
ph: 02 4625 5055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA
2 BULLECOURT AVE, MILPERRA
CANTERBURY-BANKSTOWN COUNCIL

Drawing Title: MASTER STAGING PLAN

Sheet 01 of 01
Scale 1:1500 @ A1
N

Project Number	Reference	Drawing No	Revision
2301879	302	010	N

Appendix B. Figures & Tables from SRVRs (not used)

Appendix C. Site Audit Correspondence

IAN SWANE & ASSOCIATES P/L
PO Box 359, MORTDALE NSW 2223

Mob: +61 0418 867 112
Email: iswane@bigpond.com

Mirvac Homes (NSW) Pty Ltd
Level 28, 200 George Street
SYDNEY NSW 2000

Attention: Mr Arron Tanoai – Senior Development Manager

9/08/2024

Milperra_240809_IAA01
2024_Mirvac

Dear Arron

INTERIM SITE CONTAMINATION ADVICE FOR EARLY STAGE DEMOLITION WORK, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (7 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd ('**Mirvac**') with interim site contamination advice for the early stage demolition work at the Western Sydney University ('**WSU**') Milperra Campus located at 2 and 2a Bullecourt Road, Milperra (the '**Site**'). The advice is an extension of a methodology provided in a letter to Mirvac dated 24 May 2024[1].

In my opinion, the early stage demolition work can be a critical stage of a site remediation program for residential redevelopment projects. This is because there can be a high risk of asbestos building materials being spilt and unnecessarily contaminating both the ground surface and shallow soils around demolition work areas. Large sites that previously had minimal contamination issues then became significantly contaminated as a result of poor demolition practices. This finding is based on my experience gained over the past 15 years as a Site Auditor on NSW Government urban renewal projects at Minto, Claymore, Airds and Bonnyrigg.

2. Early Stage Demolition Work Advice

The advice provided in this letter only concerns work relevant to the management and remediation of site contamination. It is recommended that Mirvac integrates this advice with other project requirements.

Based on my understanding of the WSU redevelopment project as described in my earlier 24 May 2024 letter, I provide the following interim site contamination advice:

a) **Work Objective**: Minimise the volume of soil impacted by asbestos contamination by providing Mirvac and the demolition contractor with work protocols that limit the spread of asbestos and other forms of contamination from the demolition process and minimise the mixing of demolition waste with soil to the extent practicable.

---

[1] Ian Swane & Associates (24 May 2024) "*Proposal for Site Auditor Services, Redevelopment of Western Sydney University Milperra Campus for Residential Subdivision*". Document No: Milperra_240524_Proposal prepared for Mirvac. 25 pages

b) **Contractor Selection**:

i. Demolition Contractor: Mirvac should select a demolition contractor that is reputable, experienced and suitably licensed for the removal of asbestos from buildings and structures. The Contractor needs to have a proven track record in undertaking demolition work involving hazardous building materials in accordance with SafeWork NSW and Australian Standards procedures.

ii. Licensed Asbestos Assessor (**LAA**): Mirvac needs to ensure that a reputable, experienced, qualified and suitably licensed LAA is appointed to identify the presence and extent of hazardous materials in all buildings to be demolished. The LAA needs to be a suitably qualified occupational hygienist who is independent of the demolition contractor and preferably appointed and managed by Mirvac.

iii. Environmental Consultant (**Enviro**): Mirvac needs to ensure that a reputable, experienced and qualified Enviro is appointed to inspect excavations, collect soil samples and prepare validation reports for Stage 5 belowground work. The Enviro needs to be independent of the demolition contractor and preferably appointed and managed by Mirvac.

c) **Staging of the Demolition Work**: The demolition work should be staged to minimise the risk of contamination being generated by the work and to facilitate validation of hazardous material removal. The six stages are:

i. Stage 1: Work to be completed prior to commencement of site work;

ii. Stage 2: Work to be completed prior to commencement of aboveground demolition work;

iii. Stage 3: Aboveground demolition work;

iv. Stage 4: Pavements and ground slabs;

v. Stage 5: Foundations and buried services; and

vi. Stage 6: Reporting of contamination management during demolition work.

Staging of the work in the manner suggested above will also allow Mirvac to check the performance of the demolition contractor in terms of their management of hazardous materials during each work stage.

d) **Stage 1: Work to be Completed Prior to Commencement of Site Work**:

i. The LAA needs to complete hazardous materials building assessments (**HAZMATs**) for all structures needing to be demolished where there is a risk of hazardous building materials being present. The assessments need to be documented in reports prepared in accordance with NSW SafeWork and Australian Standard requirements and represent good industry practice. The HAZMATs need to provide detailed information on all accessible hazardous materials to be removed from aboveground structures prior to demolition. The HAZMATs also need to provide detailed information on the likelihood of difficult to access hazardous materials that may be encountered during demolition work. Copies of HAZMATs need to be provided to the Site Auditor if required.

ii. The LAA needs to inspect the ground surrounding all aboveground structures to be demolished, document any visible asbestos or other forms of contamination that may be present, and manage the removal of all visible asbestos. The results of ground inspections are to be documented in reports that include asbestos clearance certificates prepared in accordance with SafeWork NSW requirements. These certificates need to certify that no visible asbestos was present around the structures where demolition work is to occur. Copies of these reports need to be provided to the Site Auditor if required.

iii. The demolition contractor needs to prepare a materials tracking plan that will track all hazardous building materials and demolition waste from cradle-to-grave. The procedure needs to generate sufficient documentation that will allow a Site Auditor to conclude that all demolition waste was removed from the site and disposed at appropriately licensed facilities in accordance with EPA requirements. The procedure needs to be approved by Mirvac.

iv. The demolition contractor needs to prepare a work plan covering the demolition procedures / protocols to be used. These procedures need to include, among other things, how previously inaccessible hazardous materials would be identified and removed following the commencement of demolition work.

v. All other work plans need to be prepared by the demolition contractor in accordance with regulatory and industry requirements and approved by Mirvac.

vi. All regulatory licenses and approvals required by the demolition work need to be obtained, with copies to be provided to Mirvac so they are available to the Site Auditor if required.

vii. All environmental and safe work control measures need to be installed.

viii. Mirvac to obtain all available data on buried services located across the site, but particularly in demolition work areas. Buried services that may contain asbestos or other waste materials need to be identified and documented on plans provided to the demolition contractor (e.g. Telstra pits, conduits, stormwater pipes). Copies of these plans are to be provided to the Site Auditor if required.

ix. Mirvac should consider restricting the demolition contractor to only access those parts of the site sufficient to allow the demolition work to proceed in an efficient manner. This would help prevent the spread of demolition waste outside demolition work areas, prevent unnecessary disturbance of ground outside the demolition work area, and facilitate inspections needing to be undertaken by Mirvac site personnel and the LAA. These work areas could be defined by star picket / tape fencing or similar together with appropriate signage.

x. Mirvac need to commence documenting site work by completing daily records and taking a photographic record of site conditions relevant to environmental and site contamination management. This documentation is to be made available to the Site Auditor if required. This work needs to continue throughout the period of the demolition work.

e) **Stage 2: Work to be Completed Prior to Commencement of Aboveground Demolition Work**:

i. All accessible hazardous building materials, chemicals and dusts need to be safely removed from aboveground structures prior to their demolition in such a way that there is no spillage or release of hazardous materials into the environment. All such materials need to be tracked from cradle-to-grave by the demolition contractor in accordance with the approved material tracking plan.

ii. All hazardous materials removed from a structure are to be immediately placed in secure bins that are securely covered and located in a designated, secure area sealed by concrete or asphalt pavement. Appropriate safety signs need to be erected and maintained in this area. No hazardous materials are to be dropped on the ground, allowed to generate dust, placed in stockpiles or left in the open. All hazardous materials placed in bins are to be classified and disposed at appropriately licensed waste facilities in accordance with EPA requirements as soon as practicable.

iii. Following the removal of all accessible hazardous materials from an aboveground structure / work area, the LAA is to inspect the structure and ground surface surrounding the structure and verify that all accessible hazardous materials have been removed by the demolition contractor and that no visible asbestos or other form of contamination remains on the ground surface. This result needs to be documented by the LAA in a clearance certificate prepared in accordance with regulatory requirements. Copies of these clearance certificates need to be provided to the Site Auditor if required.

f) **Stage 3: Aboveground Demolition Work**: This work includes the parts of a structure located above the concrete ground slab and does not include pavements:

i. Mirvac and the demolition contractor should at all times during demolition work assume that suspect asbestos containing material (**ACM**) actually contains asbestos unless testing shows otherwise.

ii. The aboveground demolition work should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Avoid disturbance of the ground;
- Avoid unnecessary damage to pavements, since these should remain in place until after aboveground structures in a work area have been removed;
- Are capable of identifying then safely and securely removing previously inaccessible hazardous materials;
- Ensure no hazardous materials are spilt on the ground or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;

- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan; and
- Remove all demolition waste generated by the aboveground demolition work prior to the LAA doing a site inspection.

iii. After all waste generated by the aboveground demolition work has been removed from a work area, the LAA is to inspect the ground surface across the work area and verify that all demolition waste and hazardous materials have been removed by the demolition contractor and that no visible demolition waste, asbestos or other form of contamination remains on the ground surface. This result is to be documented by the LAA in a clearance certificate prepared in accordance with regulatory requirements. Copies of these clearance certificates are to be provided to the Site Auditor if required.

g) **Stage 4: Pavements and Ground Slabs**:

i. Pavements and ground slabs should only be removed from a work area after aboveground structures have been removed down to the ground slab and all waste generated by the aboveground demolition work has been removed from the area.

ii. The demolition of pavements and ground slabs should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Minimise disturbance of the underlying ground;
- Are capable of identifying then safely and securely removing previously inaccessible hazardous materials (e.g. bonded asbestos sheeting used for ground slab formwork);
- Asbestos pipes / pits uncovered by the pavement and ground slab demolition work should not be disturbed below the pavement / ground slab at this time but only be identified and the area secured;
- Ensure no hazardous materials are spilt on the ground or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;
- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan; and
- Remove all demolition waste generated by the pavement / ground slab demolition work prior to the LAA doing a site inspection.

iii. After all waste generated by the pavement / ground slab demolition work has been removed from a work area, the LAA is to inspect the ground surface across the work area and verify that all demolition waste and hazardous materials have been removed by the demolition contractor and that no visible asbestos or other form of contamination remains on the ground surface. This result is to be documented by the LAA in a clearance certificate prepared in accordance with

regulatory requirements. Copies of these clearance certificates are to be provided to the Site Auditor if required.

h) **Stage 5: Foundations and Buried Services**: All foundations and buried services in demolition work areas should be removed due to the risk of hazardous materials being present in / around these structures, or contamination being present in backfill underlying / surrounding these structures. Data on the presence of belowground hazardous materials would be available from the Mirvac underground services assessment and data collected by earlier demolition work.

i. Foundations and buried services should only be removed from a work area after pavements and concrete ground slabs have been removed and all waste generated by this demolition work has been removed from the area.

ii. The demolition of foundations and buried services should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Minimise disturbance of surrounding ground;
- Are capable of identifying then safely and securely removing hazardous materials (e.g. ACM pits, conduits, pipelines);
- Ensure all hazardous materials are removed and that no hazardous materials are spilt or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;
- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan;
- Remove all demolition waste generated by the foundations and buried services demolition work;
- Place excavated soils beside trenches and excavated areas so that the Enviro can inspect final excavated surfaces; and
- Trenches / excavations are preferably not to be backfilled by placing warning fences around these areas.

iii. The Enviro needs to inspect all excavations, collect validation samples and certify that excavations are free of contamination. If contamination is found, it is to remain undisturbed and its location records. The validation work and reports need to be prepared by the Enviro in accordance with EPA guidance, with copies to be provided to the Site Auditor.

i) **Stage 6: Reporting of contamination management during demolition work**: Following the completion of demolition work in a work area, Mirvac or their Enviro should prepare a report documenting the aspects of the demolition work relevant to a site audit. These aspects should include, but not be limited to:

- Provide details of the contractors who undertook work and provide copies of licenses, approvals, notifications;

IAN SWANE & ASSOCIATES P/L

- A description of the work undertaken in each stage supported by photos and copies of site records;
- Environmental protection measures that were implemented;
- Provides copies of HAZMATs and LAA clearance reports;
- An assessment of materials and quantities of demolition waste generated;
- Provides copies of waste classification reports where required;
- Provide a copy of the materials tracking plan;
- Provide copies of documentation generated by materials tracking; and
- Provide a copy of validation reports prepared by the Enviro for the validation of excavations made for the removal of foundations and buried services.

I suggest that soon after the demolition work is underway, Mirvac formally engages the NSW EPA site auditor for the project and that I undertake a site inspection and meeting with Mirvac to review and discuss the implementation of my interim advice. Meanwhile, please don't hesitate to contact me should you require any further advice.

Yours sincerely



Dr Ian C Swane (CPEng, CEnvP & CSCS)
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Director, Ian Swane & Associates
Certified Site Contamination Specialist
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City of Canterbury-Bankstown
PO Box 8
BANKSTOWN NSW 1885

Attention: Ms Casandra Gibbons – Development Assessment Officer

12 January 2025

SA316_250112_ISAA IAA02 2024_Mirvac

Dear Ms Gibbons

INTERIM AUDIT ADVICE #02 ON COUNCIL'S 23/12/24 CONTAMINATION ISSUES, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (29 pages)

1. Purpose

This letter provides the City of Canterbury-Bankstown ('Council') and Mirvac Residential (NSW) Development Pty Ltd ('Mirvac') with interim audit advice on site contamination issues raised in a Council letter dated 23 December 2024. The letter concerns Development Application DA-1118/2024 submitted by Mirvac for the redevelopment of the Western Sydney University Milperra Campus defined as Lot 2 DP1291984, Lot 1 DP101147, No. 2 & 2A Bullecourt Avenue, Milperra (the 'site').

This letter has been prepared by Dr Ian Swane, a NSW EPA accredited site auditor who was appointed by Mirvac to provide site auditor services for all parts of the site. Dr Swane was appointed by Mirvac as the site auditor on 31 October 2024. The audit was classified as a statutory site audit at that time, with notification of the commencement of the audit sent to the NSW EPA on the same day the audit commenced. A copy of the NSW EPA notification form is provided in **Attachment A**.

The purpose of this interim audit advice is to provide Council with:

- Details on the qualifications and experience of the site auditor in providing site auditor services for urban land developments in NSW and applicable to the proposed site development; and
- Feedback that addresses the two contamination issues raised in Council's 23 December 2024 letter.

This interim audit advice is considered to be consistent with NSW EPA guidelines and policy and does not pre-empt conclusions to be drawn at the end of the site audit process. This interim audit advice does not represent a site audit statement (SAS) or report (SAR) that are intended to be prepared at various stages throughout the audit period.

2. Site Auditor Qualifications and Experience

Dr Ian Swane is a Senior Principal environmental & civil engineer with over 40 years professional experience specialising in the investigation, assessment, remediation and management of contaminated sites. Ian is an EPA Site Auditor in several Australian States

completing over 300 site audits in NSW alone. He is also a Certified Practicing (Civil) Engineer ('CPEng') and Site Contamination Specialist (SCS).

He graduated with a BE (Civil – First Class Honours) from Sydney University in 1978, worked a year for the NSW Department of Public Works then Coffey (now Tetra Tech) prior to undertaking a PhD in geotechnical engineering at Sydney University, which he completed in 1983. He then worked for a US-based geotechnical and environment engineering consultancy (D'Appolonia) in Belgium and Italy for 3 years, working mainly on the investigation and design of offshore structures and nuclear power plants in Europe, the Middle East and Africa. It was during this period that he commenced undertaking contaminated site assessments and groundwater modelling for nuclear power plants.

He returned to Sydney in 1985 as a Senior Geotechnical Engineer for Dames & Moore (now part of AECOM), where he began a contaminated sites practice along with his geotechnical engineering. His early work concentrated on the investigation and remediation of gasworks sites such as Mortlake (now the Breakfast Point residential estate), Little Manly Point (Manly) and Waverton (now the Wondakiah residential estate). In the early 1990s he was also appointed by NSW Maritime as their site contamination expert for the remediation of dioxin contamination in the Homebush Bay sediments prior to the 2000 Sydney Olympics.

During the 1990's Ian's contaminated site's workload steadily increased and took over from his purely geotechnical projects. Dr Swane has been a NSW EPA site auditor since the scheme began in 1997 and prior to that a Site Auditor in Victoria. He has also been an accredited Site Auditor in QLD, ACT, WA and the NT since their schemes began.

He has investigated and remediated many of the largest contaminated sites in Australia and been a technical adviser to Government agencies on key projects (e.g. BHP Hunter Sediment Remediation Project, BHP Steel River Remediation Project, Homebush Bay Dioxin Remediation Project). He has also managed or audited many contaminated site projects that have been redeveloped for major residential subdivisions.

Further details of Ian's qualifications and expertise are provided in his CV in **Attachment B**.

3. Feedback on Issue 2 in Council's 23/12/24 Letter

Issue 2 in Council's 23/12/24 letter is:

> *"A NSW Environment Protection Authority accredited site auditor must be appointed to audit reports compiled as part of the contaminated land assessment, remediation, and validation process. As part of our assessment, a Site Audit Statement and Site Audit Report must be provided to Council from the site auditor that clearly states that the site is, or can be, made suitable for the intended use. The Site Audit Statement and Site Audit Report must include any restrictions or management requirements for the site. The Site Audit Statement and Site Audit Report must be submitted to Council."*

Site Auditor's Feedback

As mentioned in Section 1 above, Dr Swane is a NSW EPA accredited site auditor who was appointed by Mirvac to provide site auditor services for all parts of the site. Dr Swane was appointed by Mirvac as the site auditor on 31 October 2024. The audit was classified as a statutory site audit at that time, with notification of the commencement of the audit sent to the NSW EPA on the same day the audit commenced. A copy of the NSW EPA notification form for the site is provided in **Attachment A**.

Dr Swane is contracted to Mirvac to supply a SAS / SAR for each stage of the development after contamination in a stage has been remediated and when the land in that stage is suitable for its intended land use in accordance with the Contaminated Land Management (CLM) Act.

4. Feedback on Issue 1 in Council's 23/12/24 Letter

Issue 1 in Council's 23/12/24 letter is:

> *"In accordance with Clause 4.6 in Chapter 4 of SEPP (Resilience and Hazards) 2021, the consent authority must not consent to carrying out of development unless they are satisfied that the proposal will meet the below requirements.*
>
> *4.6* ***Contamination and remediation to be considered in determining development application***
>
> *1) A consent authority must not consent to the carrying out of any development on land unless—*
>
> *a) it has considered whether the land is contaminated, and*
>
> *b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and*
>
> *c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.*
>
> *The application has been accompanied by a Detailed Site Investigation, Supplementary Detailed Site Investigation and two Remediation Action Plans (RAP). The reports provided have identified that the entire development site contains areas that require remediation to ensure the site is suitable for the residential land use.*
>
> *The current submission seeks approval to remediate stage 1 residential allotments and has not provided details and further reporting on the remaining site area.*
>
> *The remediation of the* ***entire*** *site must be proposed within this application and occur prior to the registration of any subdivision certificate. The detailed RAP prepared by Sydney Environmental Group dated September 2024, for stage 1 only, is not sufficient while the RAP prepared by Alliance in September 2022 for the wider site, requires further reporting and testing to be undertaken and detailed RAP's prepared across the site. An updated RAP is required that provides a comprehensive review of the entire site and addresses the*

data gaps outlined in the DSI reports provided for the site. Any additional testing and reporting outlined in any applicable DSI or RAP must be undertaken. All reports submitted must be final reports and not draft versions for review and assessment.

As demolition has commenced on site, this will enable further testing and reporting to be completed for a comprehensive review of the site and remediation strategies.

The RAP prepared by Alliance in 2022 notes that onsite encapsulation may be undertaken to achieve the remediation strategies within the RAP. Where onsite encapsulation is proposed in the final RAP, the RAP must include indicative drawings of where the proposed encapsulation will occur within the site and a draft Long Term Environmental Management Plan (LTEMP) for Councils review and assessment, noting that Council will not accept the dedication of land that is subject to a LTEMP.

Where trees and vegetation will be disturbed and impacted by the remediation on site, further assessment of the impact of the activities on the trees is required to be provided. A detailed plan must be provided to show the location of remediation works and the vegetation onsite. Where vegetation adjoins remediation works, details must be provided on the depth and impact of those works likely to the vegetation. Where vegetation will be impacted, this should be considered in the associated biodiversity assessment and arborist reports."

Site Auditor's 24 May 2024 Review

The site auditor has reviewed the following past reports:

1. Alliance Geotechnical Pty Ltd (30 January 2020) *'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214, Lot 103 DP874035'*. Document No. 9996-ER-1-1 prepared for Mirvac
2. Alliance Geotechnical Pty Ltd (15 September 2022) *'Remedial Action Plan, Western Sydney University – Milperra Campus, Horsely Rd & Bullecourt Ave, Milperra, NSW 2214'*. Document No. 9996-ER-2-1_Rev03 prepared for Mirvac
3. Walkden L (27 September 2022) '*Site Audit Report, Remediation Action Plan, Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra'*. Audit No: LW-030 prepared for Mirvac
4. Walkden L (27 September 2022) Section B Site Audit Statement for Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra. Audit No: LW-030 prepared for Mirvac
5. Beveridge Williams (14 November 2023) Drawings '*WSU Milperra, Demolition DA, 2 Bullecourt Avenue, Milperra*'. Drawing Nos. 2301879 301 010 to 031 prepared for Mirvac
6. Beveridge Williams (15 January 2024) Drawing '*Staging Plan, WSU Milperra 2 Bullecourt Ave, Milperra, Canterbury-Bankstown Council*'. Drawing No. 2301879 302 010C prepared for Mirvac

7. Sydney Environmental Group (22 February 2024) '*Supplementary Stage 2 Detailed Site Investigation, Western Sydney University Milperra Campus, Milperra NSW*'. Document No. 2300-DSI-01-220224.v1f prepared for Mirvac

The main findings from this review were documented in feedback to Mirvac dated 24 May 2024, with a copy provided in **Attachment C**. The overall finding is that the main contamination issue is the presence of random bonded asbestos fragments located in fill historically placed at the site. This is a common problem with land in Sydney developed between the 1950's and 1980's, such as the Milperra suburb.

The remediation technologies for asbestos contamination recommended by the Alliance 2022 RAP were a combination of off-site disposal and containment / capping with long term management using an LTEMP. In my opinion, other primary technologies need to be considered such as selective excavation of different fill materials, and on-site processing of fill containing ACM so the soil can be reused on-site. Some of my other recommendations are:

- Off-site disposal should be restricted to materials where asbestos is concentrated, to highly asbestos contaminated soil where on-site processing is impractical, to ACM pipes/ pits, and as a contingency measure;
- Containment / capping should be restricted, where possible, as a contingency measure and to materials that meet the Recreational C criteria in order to avoid the requirement for an LTEMP needing to be approved in writing by Council; and
- The recommendations for further investigation work made by the Alliance 2022 RAP were good ones to address data gaps and deficiencies in the Alliance 2020 DSI. In my opinion, most of these data gaps were addressed by the SEG 2024 investigation, the exception being under building footprints / pavements.

Site Auditor's 24 May 2024 Review

The site auditor issued another interim audit advice report to Mirvac on 24 May 2024, with a copy provided in **Attachment D**. The advice concerned the early stage demolition work.

My report concluded that the early stage demolition work can be a critical stage of a site remediation program for residential redevelopment projects. This is because there can be a high risk of asbestos building materials being spilt and unnecessarily contaminating both the ground surface and shallow soils around demolition work areas. Large sites that previously had minimal contamination issues then became contaminated as a result of poor demolition practices. This finding is based on my experience gained over the past 15 years as a site auditor on NSW Government urban renewal projects at Minto, Claymore, Airds and Bonnyrigg.

Site Auditor Feedback on Council's Issue 1

1) With regard to Section 4.6 of the SEPP, this interim audit advice to Council confirms that:
   a) Council has considered whether the land is contaminated;
   b) The need for Council to be satisfied that the land will be in a suitable, after remediation, would be addressed by the Development Consent including a condition

requiring that a NSW EPA accredited site auditor be appointed to undertake a site audit for all aspects of the proposed development, and to issue an Section B SAS/SAR concluding that the site can be made suitable for its intended land use if remediated in accordance with a remediation action plan (RAP) prepared in accordance with NSW EPA guidance. Any recommendations made by the site auditor in the Section B SAS/SAR need to be also followed by Mirvac.

c) The need for Council to be satisfied that the land will be remediated before the land is used for that purpose without the need for an LTEMP would be addressed by the Development Consent including a condition requiring the NSW EPA accredited site auditor to submit a Section A1 SAS/SAR for each part of the site, certifying that the area of land is suitable for its intended land use prior to the commencement of above ground building construction work at the area.

2) Council requires the remediation of the entire site to be proposed within the current Mirvac application and prior to the registration of any subdivision certificate. The site auditor recently received a revised copy of a RAP addendum prepared by the Sydney Environmental Group (SEG) dated 10 January 2025. The RAP addendum advises that the document is an extension of the Alliance 2022 RAP.

   Council can be satisfied that the Alliance 2022 RAP and the SEG 2025 RAP addendum will provide a remediation strategy meeting Council's requirements as set out in your 23 December 2024 letter by including the two Consent conditions recommended above.

3) Council requires that where trees and vegetation will be disturbed and impacted by the remediation on site, further assessment of the impact of the activities on the trees is required to be provided. A detailed plan must be provided to show the location of remediation works and the vegetation onsite. Where vegetation adjoins remediation works, details must be provided on the depth and impact of those works likely to the vegetation. Where vegetation will be impacted, this should be considered in the associated biodiversity assessment and arborist reports.

   The Site Auditor considers this requirement can be addressed by a Consent condition.

Yours sincerely



Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
Director, Ian Swane & Associates
Certified Site Contamination Specialist
Phone: 0418 867 112
Email: iswane@bigpond.com

IAN SWANE & ASSOCIATES P/L

Attachment A: NSW EPA notification form for site (5 pages)

Attachment B: Dr Ian Swane CV (7 pages)

Attachment C: Site Auditor's 24 May 2024 interim audit advice (3 pages)

Attachment D: Site Auditor's 9 August 2024 interim audit advice (7 pages)

NSW Site Auditor Scheme

Site Audit Notification

Section 53C of the *Contaminated Land Management Act 1997* requires auditors to notify the NSW Environment Protection Authority (EPA) of statutory site audits within seven days of their being commissioned.

Proposed site audit details

Site audit no. **316**

This proposed site audit is a:

☑ **statutory audit**

~~☐ non-statutory audit~~

within the meaning of the *Contaminated Land Management Act 1997* (s. 47).

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name	**Dr Ian C Swane**		
Company	**Ian Swane & Associates P/L**		
Address	**PO Box 359, Mortdale NSW**	Postcode	**2223**
Phone	**0418 867 112**		
Email	**iswane@bigpond.com**		

Site details

Address **Western Sydney University Milperra Campus, 271 Horsley Road & 2 Bullecourt Avenue, Milperra NSW** (**Figure 1)** Postcode **2214**

Property description

(Attach a separate list if several properties are included in the site audit.)

Lot 2 DP1291984

Local government area **City of Canterbury-Bankstown**

Area of site (include units, e.g. hectares): **18.83 ha (188,300 m^2)**

Current zoning **R1 General Residential (majority of the site); RE1 Public Recreation (northern, central and southern portions of the site); B1 Neighbourhood Centre (north-eastern portion of the site); C2 Environmental Conservation (north-eastern corner of the site)**

Regulation and notification

To the best of my knowledge:

☐ ~~**the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)~~

~~☐ Declaration no.~~

~~☐ Order no.~~

~~☐ Proposal no.~~

~~☐ Notice no.~~

☑ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ ~~the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*~~

☑ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name **Nibraas Ahmad, Development Manager**

Company **Mirvac Residential (NSW) Developments Pty Ltd**

Address **Level 28, 200 George Street, Sydney NSW**

Postcode **2000**

Phone **0406 006 792**

Email **nibraas.ahmad@mirvac.com**

Purpose of site audit

☑ **A1** To determine land use suitability

Intended uses of the land: **Residential, commercial, recreational open space and road corridors**

~~OR~~

~~**A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan~~

~~Intended uses of the land:~~

~~OR~~

~~(Tick all that apply)~~

~~☐ **B1** To determine the nature and extent of contamination~~

~~☐ **B2 To** determine the appropriateness of:~~

~~☐ an investigation plan~~

~~☐ a remediation plan~~

~~☐ a management plan~~

~~☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

~~☐ **B4** To determine the compliance with an approved:~~

~~☐ **voluntary management proposal** or~~

~~☐ **management order** under the *Contaminated Land Management Act 1997*~~

~~☐ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.~~

~~Intended uses of the land:~~

Nature of statutory requirements (not applicable for non-statutory audits)

~~☐ Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)~~

~~None~~

~~☐ Requirements imposed by an environmental planning instrument (please specify, including date of issue)~~

~~None~~

☑ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

Development application process for Canterbury-Bankstown Council to support the issuing of a development consent

~~☐ Requirements under other legislation (please specify, including date of issue)~~

~~None~~

Overall comments:

I understand that another site auditor provided some non-statutory site audit advice for this site a few years ago but that the earlier site audit has been terminated by Mirvac.

Auditor's declaration

I certify that the information supplied in this form and any attached pages is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.



Signed

Date **31 October 2024**

Please send completed forms to:

NSW Environment Protection Authority
nswauditors@epa.nsw.gov.au or as specified by the EPA

Figure 1 Site Location Plan (Source: Figure 1, RAP)





Dr Ian C Swane (CPEng, CEnvP, CSCS)

EPA SITE AUDITOR NSW & NT; SENIOR PRINCIPAL CONTAMINATED LAND ENGINEER; CERTIFIED SITE CONTAMINATION SPECIALIST & ENVIRONMENTAL PRACTITIONER; CERTIFIED PRACTICING CIVIL ENGINEER

CURRENT POSITION

Director & Senior Principal Contaminated Land Engineer IS&A, Site Auditor NSW & NT

QUALIFICATIONS

Certified Practicing Civil Engineer, Certified Site Contamination Specialist, Certified Environmental Practitioner, PhD (Geotechnical Eng/ng), Sydney Uni. (1983); BE (Hons) (Civil), Sydney Uni. (1977); Site Auditor in NSW (since 1997) & NT (since 2011)

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS

Institution of Engineers Australia (IEAust); Australian Geomechanics Society (AGS)

EXPERTISE

- Contaminated land management
- Independent environmental auditor
- Waste assessment
- Health & enviro risk assessment
- Hazardous ground gas
- Radionuclide contamination
- Landfill rehabilitation
- Civil & geotechnical engineering
- Expert witness support
- Regulatory & approval support

CONTACT

- Mobile: 0418 867 112
- Email: iswane@bigpond.com

Summary of Competencies

Dr Ian Swane is a Senior Principal environmental & geotechnical engineer with over 40 years professional experience specialising in the investigation, assessment, remediation and management of contaminated sites, health & ecological risk assessments, environmental audits & waste management in Australia, SE Asia, and Europe. He has investigated & remediated many of the largest contaminated sites in Australia & been a technical adviser to Government agencies on key projects. He has been an EPA Site Auditor in NSW, VIC, QLD, ACT & NT and completed over 290 site audits in NSW.

He has experience in the design, tendering, value engineering, construction management & validation of a wide range of remediation technologies such as bioremediation, coal sludge recycling, capping/containment, barrier walls, thermal desorption (direct & indirect), BCD, steam stripping, stabilisation and water treatment.

He has extensive experience in auditing landfill & waste containment projects involving LFG, radon gas & heavy mineral sand radionuclide/heavy metal waste. This has led to beneficial reuse of former derelict sites for residential housing estates, high-rise apartments, open space, commercial uses.

Major projects he is currently working on include the M6 Stage 1 motorway for CPB-Ghella-UGL JV, Western Sydney University Milperra Campus (19ha), Mirvac Georges Cove remediation project (10ha), Georges Cove Marina (17ha) and Riverlands Milperra (81ha).

Dr Swane has written many technical papers & been an invited speaker at local & international conferences/seminars & a guest lecturer at UTS post-grad courses. He is the recipient of an Engineering Excellence Award from the IEAust for the remediation of Little Manly Gasworks, the W H Warren Medal from IEAust & the inaugural D H Trollope Medal from the AGS.

PROJECT EXPERIENCE: Government Appointed Expert:

Projects where Dr Swane has been a Government–appointed technical adviser:

Rockhampton City Council Lakes Rd Landfill Vertical Expansion Project (2021): The Council-appointed peer reviewer for the proposed expansion of the regions main landfill and resource recovery centre.

Steel River Remediation Project (2010-2019): Chairman of an expert panel set up by BHPB and NSW EPA to develop success criteria, success measures and remediation strategy for the former BHP Steelworks waste disposal area now known as Steel River, Hunter River. This work continues.

Lake Macquarie City Council (Feb. 2012): Developed/presented 3-day staff training workshop on “Technical Assess/t of Rezoning & Develop/t Applications Requiring Contam. Land Management”

Dr Ian C Swane (CPEng, CEnvP, CSCS)

EPA SITE AUDITOR & SENIOR PRINCIPAL CONTAMINATED LAND ENGINEER

Homebush Bay Dioxin Remediation Project (1999–2007): Remediation strategy assessment, tender assessment, detailed HHRA for the remediation of the Homebush Bay sediments and technical reviews to Maritime NSW and Dept Public Works. Project value >$100M

BHP Newcastle Steelworks Remediation Project (2005-2009): Expert technical advice to Hunter Development Corporation & NSW EPA on Hunter River contaminated sediment remediation, the design of the emplacement cell at Kooragang Island, and remediation work for the new coal loader.

Contaminated Sediment Reviews (2001-2008): Expert technical advice on water-ways in Sydney Harbour & Parramatta River for NSW Maritime. Work involved reviewing investigation reports, ecotox studies, groundwater / health / ecological risk assessments

Dept. of Defence Technical Adviser (2001-2008): Independent expert technical adviser for investigation &/or remediation of HMAS Platypus (Neutral Bay), Adamstown Rifle Range, Myambat Logistics Depot, Evans Head Air Weapons Range.

ACT Landfill Inquiry (1999): Provided expert report on environmental management practices for West Belconnen Landfill for the ACT Urban Services Dept.

EPA Accredited Contaminated Land Auditor

NSW

- Completed over 300 EPA site audits for major infrastructure sites, Defence sites, landfills, chemical plants, airports, large communication sites, public open space, residential / commercial sites, & agricultural lands across Sydney, Hunter Valley, regional NSW & ACT
- Site auditor to NSW Government on asbestos contaminated sites for Landcom urban renewal projects at Riverstone, Minto, Claymore, Airds, Bonnyrigg & Cobbora Mine at Dunedoo; and for Homes NSW at Glebe (2)
- Site Auditor for urban renewal projects on landfill sites at Unanderra, Bulli and Moorebank (3)
- Site Auditor on M6 Stage 1 motorway for CPB-Ghella-UGL JV, WestConnex Stage 3A Acciona-Samsung-Bouygues JV; expert advice on waste classification/ disposal & asbestos in mulch at Rozelle Interchange for John Holland & CPB and Parramatta Light Rail
- Site Auditor to Department of Defence on the Holsworthy Barracks PFAS Project; remediation of Belconnen Naval Transmitting Station, Fort Wallace, Stockton Rifle Ranges & training depot at Port Kembla
- Site Auditor for PFAS contamination at Dubbo Airport NSW Police training facility
- Site Auditor for Cockatoo and Snapper Islands for the Sydney Harbour Federation Trust & Macquarie Lightstation (Sydney) for Dep. Finance

QLD, NT, Vic & WA

- TPR for Jezzine Barracks (Townsville), West End Gasworks site for Stocklands & Energex & a residential development in Northgate (Brisbane)
- NT EPA Site Auditor for petroleum remediation at Milner Bay port & asbestos cleanup at Groote Eylandt
- Channel 7 facilities at Docklands, Melbourne
- WA DWER Site Auditor for heavy mineral sand processing sites at Geraldton (Narngulu), Capel & Bunbury, including waste containment cells, plant sites & surrounding residential / agricultural land
- Site Auditor for 4 Shell petroleum sites (Perth), oil storage depot (Esperance), Amcor Paper Mill (Bibra Lakes), Australian Fine China site (Subiaco), Pioneer Road Services site (Subiaco), Automasters site (Northbridge), sewage treatment pond (Coral Bay), former Pyrton mental hospital (Bassendean), property developments at Southern River and Baldivis

Detailed Health & Ecological Risk Assess/t

- EPA-recognised health & ecological risk assessor & member of Australasian College of Toxicology & Risk Assessment (ACTRA)
- Kendall Bay Sediment and Hickson Road Gasworks Remediation Projects (Jemena)
- BHPB Steel River (Newcastle) involving contaminated groundwater, foreshore seeps, sediments, volatile gas emissions, marine fauna & flora studies
- Homebush Bay contaminated sediments (NSW Waterways Authority), lead & other heavy metal contamination along 3 major water supply pipelines (Sydney) & MacDonaldtown gasworks site (Sydney)
- Former liquid waste disposal centre at Gosnells WA
- VCH contamination Botany rail facility, & VOC contam/n at residential estate at Banksia (Rockdale Council)
- VOC contamination at former lead battery site Granville
- Attended March 2013 & May 2010 ACTRA Workshops

Independent Environmental Auditor

- Menangle Sand & Soil Quarry (2024) & Mayfield West Benedict Recycling Facility (2023)
- EPA POEO Waste Audit for Benedict Chipping Norton facility (2022 & 2023), Benedict Unanderra Recycling Facility (2023) & 7 Stars Sefton facility (2022)

IAN SWANE & ASSOCIATES

Dr Ian C Swane (CPEng, CEnvP, CSCS)

EPA SITE AUDITOR & SENIOR PRINCIPAL CONTAMINATED LAND ENGINEER

Investigations & Remediation Projects:

- Assessment of site remediation strategies for Hickson Road gasworks (Jemena), the Steel River Site Newcastle (BHPB) and Kendall Bay contaminated sediment remediation project (Jemena)
- Project Manager for detailed investigation & remediation of Jervis Bay Range Facility for Defence (1999-2003)
- Project Superintendent for site remediation works at 6 gasworks sites (Mortlake, Oyster Cove, Maitland, Albury, Manly, Abbotsford), chemical plant, pharmaceutical plant, 2 oil storage facilities & railway maintenance project. Remediation methods include thermal desorption, soil washing, off-site disposal, capping and containment, co-burning, bioremediation, solidification/stabilisation, incineration, pump-and-treat
- Project Manager 1987-1998 for remediation 51ha Mortlake Gasworks site (Sydney), including all site investigations, engineering assessments, detailed design, tender documentation, contract administration & construction management. Work included $40M cleanup program, $10M recovery & recycling program for 33 million L coal tar sludge, $3M lab validation program, $1M biorem trial gasholder cleanup, EIS for entire remediation project, technology trials, preliminary engineering, constructability review, value engineering, strategic planning, risk managt
- Prel. engineering for remediation of petroleum sludge lagoons, Sera Brunei (Shell).
- Design study for use of coal wash reject for capping contaminated site Newcastle.
- Project Director for design, construction, operation of in-situ bioventing and groundwater treatment system at former petrol station site at Killara, Sydney.
- Project Director & /or Manager for investigation & design of rehabilitation strategies for commercial developments built on former landfill & unhealthy building land sites at St Peters Landfill (South Sydney Council), Salt Pan Reserve Landfill Brooklyn (Hornsby Council & Rural Fire Service).
- Project Director for $3M project treating 7,500t of PCB contaminated soil in Manila using thermal desorption.
- Project Superintendent for remediation of pharmaceutical wastes (Merke Sharpe & Dohme).
- Remediation design/costing for lead smelter
- Remediation design for a PCB decontamination program at a substation.
- Design/supervision of groundwater treatment & disposal systems at rehabilitated sites in Sydney (eg gasworks, chemical plant, pharmaceutical plant & public park).
- Contam/n assessments, engineering, & remediation of former asphalt plant at Wolli Creek, Sydney for State Rail
- Design / supervision of remediation using cement stabilisation of chrome contaminated soils at Parramatta.

Contaminated Site Investigation & Assess/t

- Technical reviewer of investigation, risk assessment & RAPs for Hickson Road Gasworks (Sydney).
- Site investigations, design studies, audits, regulatory approval, licensing, tender documentation for large number of contaminated sites including 9 former gasworks, fuel depots, railway facilities, power facilities, landfills, mines, aluminium smelter, chemical & pharmaceutical plants
- Contaminated sediment assessments for Jemena at Kendall Bay (Sydney) and BHPB Hunter River
- Contaminated sediment assessments for NSW Water-ways Authority for Homebush Bay, Abbotsford Bay, Parramatta River adjacent to former Mortlake Gasworks site, former oil storage/ manufacturing facilities at Ballast Point & Berrys Bay, & marinas at Long Bay & Chiswick.
- Contaminated sediment assessments for the DPWS at Kogarah Bay, Rozelle Bay, Iron Cove, Brays Bay and Curl Curl Lagoon.
- PM for prel. & detailed investigation of Beecroft Naval Weapons Range (Jervis Bay) involving contam/n, UXO and ecological studies. Project Manager for preliminary investigation of Enoggera Gallipoli Barracks (Qld).
- Phase II contamination/risk assessments/ RAPs at putrescible landfill & former sand mine North Entrance for Aboriginal Land Council, railway maintenance facility Chullora (Rail Services Australia) & Kooragang Island freight terminal (FreightCorp), for properties owned by Sydney Water, at former sewerage treatment plant & night soil disposal sites at West Wallsend & Bankstown, 16 properties owned by Integral Energy, 8 properties owned by EnergyAustralia.
- Contam. assessment/remediation options/ engineering for residential estate in Banksia (Rockdale Council), construction of community facility at former landfill at Sydney Park, St Peters (Sydney Council), former lead battery site at Granville.
- Environmental due diligence audits for FreightCorp's 62 property portfolio
- Groundwater contamination studies for 3 Italian nuclear power plants (Latina, Cirene & Montalto) involving analyses of groundwater flow, saltwater intrusion & radioactive pollutant migration; design studies for radio-active waste repository (Cirene).

Solid & Hazardous Waste Management

- Technical expert to NSW Government on Homebush Bay Dioxin Remediation Project (1999-2005) involving evaluation of remediation technologies including indirect/ direct thermal desorption technologies, base catalytic dechlorination, cap & contain.

Dr Ian C Swane (CPEng, CEnvP, CSCS)

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- Expert review/reporting of landfill design & environmental health risks for Ravensworth Waste Management Centre at Hunter Valley (Singleton Council); environmental management practices for ACT landfills for ACT Government (Urban Services Department); landfill management procedures for Ardlethan Landfill &testimony at Commission of Inquiry.
- Design of oil-sludge compost facility for Shell Clyde oil refinery (Sydney); design remedial works for fly ash dams at decommissioned Tallawarra power station.
- Design management of secure landfills for Albury & Sydney City Council, aluminium smelter, former gasworks sites, chemical & manufacturing plants
- Appointed by World Bank to undertake feasibility study into design of Hazardous Waste Landfill for the JABOTABEK region in Indonesia (1992).
- Expert witness for Bega Valley Shire Council in Land & Environment Court for Merimbula Landfill site (1998), & in Commission of Inquiry for Werribee Secure Landfill, Victoria (1997).
- Stabilisation & disposal of pesticide contaminated waste for Dow Chemicals.
- Investigation & design of secure landfills & containment cells for Albury & Sydney City Council, aluminium smelter, 0.7Mcm cell at former Mortlake gasworks, containment cell at former Maitland gasworks, Camellia chemical plant, & 17000cm cell at former lead battery site at Granville.

Highways, Foundations, Dams and Tunnels

- Independent geotechnical review for Alice Springs to Darwin railway
- Stability assessments for major road cuttings & embankments in RTA highway network over Sydney; geotechnical design review for the M5 (East) Highway
- Investigation, design, regulatory approvals, inspections & construction monitoring for de-watering program, foundations, retaining walls, excavations and slope stabilisation works at Eastern Distributor Project
- Investigation, design and construction supervision of retained earth walls, embankments, bridge abutments, cut slopes, support systems at M5 Tollway & M5 Western Link
- Geotechnical investigations for Botany Highway at Mascot, Sydney. Studies included site investigations, embankment instrumentation & monitoring, remedial design of pipeline foundations & supervision of chemical grouting program
- Rock slope stability assessment for spillway abutment at Dartmouth Dam, Victoria; geotechnical design review for 2 water storage dams & building foundations at Redbank Power Station (ABB)
- Investigation, design, tender documentation & project supervision for reconstruction of failed dam at Mt Annan, NSW; rock excavation assessment for Nepean Dam augmentation works
- Geotechnical investigation & foundation design for telecommunication towers for Orange Network (Sydney), SA-NSW Inter-connector transmission line for Trans-grid; Designing tender documentation & project supervision for reconstruction of damaged telecommunications tunnel
- Geotechnical assessments for Rouse Hill Water Project (Sydney); foundation assessment for property development at North Ryde for Business Land Group; geotechnical design review for Port Botany container crane rail system
- Design for Cofferdam sheetpile wall for Yarrawonga power station (Murray River); rock excavation, support investigation & design for rock cavern at North Head
- Geotechnical investigations for several nuclear power plants in Italy. Studies included foundation designs for retaining walls, rafts & diversion tunnels, & slope stability assessments in soil & rock

Mining Geotechnical Studies

- Geotechnical investigations & design studies for Lihir Island Gold Mine (PNG) 1987-1992. Investigations included plant sites, dams, wharves, causeways, harbour reclamation, airport, pipelines, haul roads, stockpiles, waste disposal, & economic trade-off studies
- Stability assessments of Open Pit Slopes for Iron Monarch & Callide Mines (SA & QLD. Studies involved computer analysis of the rock slopes using Finite Element techniques
- Geotechnical assessment for primary crusher at a magnesite mine (Young)

Offshore and Coastal Engineering

- Principal offshore Design Engineer for design & installation of 31 steel jacket structures in Arabian Gulf (Saudi Aramco)
- Geotechnical studies for Goodwyn Plat-form, Northwest Shelf (WA). Investigations involved pile design studies for platform. Site selection study for driven & grouted pile test program for Esso
- Design of pile foundations in marine soils & weak rock, pile driveability studies, seismic design of foundations, liquefaction assessments, & studies on jack-up rigs for North Sea, Mediterranean Sea & west coast of Africa
- Design of caissons & port facilities, soil-structure interaction studies, & liquefaction assessments for port in Algeria; Dynamic analysis of pile foundation for a coal unloading terminal at Milazzo, Sicily.
- Design studies for waterway developments around Sydney, including dredging assessments, dredge spoil disposal schemes, land reclamations, marine foundations, seabed reconnaissance & pollution assessments. Sites

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include Kogarah Bay, Rozelle Bay, Iron Cove, Brays Bay & Curl Curl Lagoon.

- Offshore geotechnical investigation & engineering design for large harbour reclamation project in PNG.
- Maintenance dredging study at Brooklyn, NSW.

Expert Witness/Reporting

- Expert witness in Victorian Supreme Court for remediation strategy & costs at the former Alphington paper mill, Melbourne (current)
- Expert witness in Federal Court for ground contamination matters involving a former timber treatment site Armidale, a former battery manufacturing plant at North Ryde & former petrol station at Killara.
- Expert witness in NSW Supreme Court for contaminated sites at Camperdown, Kurnell (Serenity Cove) & Unanderra; former night-soil disposal facility at Bankstown; a slope failure at Dural.
- Expert witness in the NSW Land & Environment Court for asbestos contamination (Cawdor), service station remediation at Mascot & Brighton-le-Sands, proposed commercial development (Kurnell); a waterway development (Sydney); a closure plan for Riverstone landfill & remediation SCW at Rhodes.
- Expert witness in a District Court for foundation failure in Campbelltown.
- Expert witness in Qld Supreme Court (Mackay) for a former gasworks site.
- Expert witness in Commission of Inquiry, Werribee Landfill, Victoria.
- Expert reporting for ACT Government Solicitor on major asbestos remediation project
- Expert reporting for Federal Government Standing Committee on remediation of HMAS Platypus site, Neutral Bay
- Expert reporting in NSW Supreme Court for treatment of dioxin contaminated soil by thermal desorption at Homebush Bay; a contaminated site at Marrickville; a soil stabilisation process; the use of coal wash reject at a major residential subdivision at Illawarra; contamination at the Brookvale Brickworks
- Expert reporting for NSW EPA prosecution in Land and Environment Court under EO&P Act for pollution at a manufacturing facility in Tumut, NSW
- Expert reporting in Land & Environment Court for pollution incident at Merimbula Waste Depot; a contaminated Site at HMAS Platypus (North Sydney); the remediation of a service station site at Wollongong
- Expert reporting for Qld Supreme Court for the remediation of Newstead Gasworks (Brisbane)
- Expert reporting for contaminated sites at Hickson Road Gasworks Barangaroo, Brookvale Brickpit, Maitland, 2 at North Ryde, 1 at Penrith, Gladesville, Camper-down & Condell Park, the thermal desorption of dioxin contaminated soil at Rhodes, the investigation & remediation of chlorinated solvent contamination at large dry cleaners operation at Alexandria (Sydney), remediation of Scheduled Chemical Waste at Olympic Precinct North Homebush (Sydney); asbestos contamination in NT building; former railway maintenance facility (Chullora); a pesticide pollution incident at Shellharbour (NSW)
- Expert reporting for geotechnical issues at a building in Leichhardt, a retaining wall failure at Stanmore, a buried pipeline failure at the Central Coast, a dam failure at Mount Annan (NSW), a failed sewerage treatment lagoon at Echuca (Vic) and for the impacts of a sand and gravel quarry on the Hunter River and Aberglasslyn House

POSITIONS HELD

Ian Swane & Associates 2002 to present
Director, Senior Principal Engineer for CLM & EPA Site Auditor.

Jacobs / SKM 2006 to 2017
Senior Principal Engineer for CLM & EPA Site Auditor

August 1999 to 2005

Senior Executive Engineer & Manager of Contaminated Sites and Geotechnical Groups based in Sydney

Dames & Moore
March 1997 to July 1999

Director, Principal Engineer and Manager of the Major Environmental Projects Office in Sydney. Main emphasis was remediation and development of “Brown-Field Sites”, “Environmental Performance Based Contracting” and “Project Management” of major projects for clients in Australia and South East Asia

March 1989 to March 1997

Principal Engineer and Manager of the Geotechnical and Site Remediation Groups in Sydney

May 1986 to March 1989

Senior Geotechnical Engineer responsible for the management of geotechnical engineering projects for major infrastructure and mining developments, and for the management of contaminated sites investigations and site remediation projects

D'Appolonia SPA, Italy & Belgium 1983 to 1986
Senior Engineer. Responsible for the management of projects in offshore engineering, coastal engineering, geotechnical investigations, and groundwater contamination studies

Sydney University 1979 to 1983
Ph.D Postgraduate Student, University of Sydney. Research topic was the cyclic behaviour of laterally loaded piles, which involved the development of numerical methods

Dr Ian C Swane (CPEng, CEnvP, CSCS)

EPA SITE AUDITOR & SENIOR PRINCIPAL CONTAMINATED LAND ENGINEER

for predicting the performance & safety of pile foundations, as typically occur in fixed offshore structures

Coffey & Partners 1978

Project Engineer involved in groundwater studies, pile design, foundation investigations and stability assessments

Department of Public Works, NSW 1974 to 1978

Cadet Engineer & Assistant Project Engineer, where experience was gained in foundation investigation, design studies, dam construction, engineering geology & municipal engineering

Languages

English

Contaminated Land Papers and Presentations

- Swane IC. September 2024. "Challenges in Constructing a Residential Subdivision on a Landfill – A Case Study". Cleanyp24, Adelaide
- Swane IC. October 2018. "Unexpected Finds – What is Acceptable Practice?". 2018 EcoForum Conference - Session Theme: Data – Identify and Assess, Sydney
- Presenter at ALGA June 2017 hypothetical 'A SAS isn't worth the paper it's written on?'
- Session Reporter Environmental Testing, 5th International Conference on Geotechnical & Geophysical Site Characterisation, Sept 2016
- Lecturer at University of Technology (UTS) Sydney course 2010-present: Topics comprised "Remediation – current trends", Defensible Reporting", "From site assessment to remediation, clarification of issues", "Martin Street Armidale – How Things Could Still Go Wrong Even with a Site Auditor", and "Working together here and now"
- Swane IC. Sept 2016. "Session Report – Environmental Testing". 5th International Conference on Geotechnical & Geophysical Site Characterisation, Gold Coast QLD
- Swane IC. 6 April 2016. "Ethics in Contaminated Land Management – an Auditor's Perspective'. ALGA
- Swane IC. October 2014. "Cleaning up Clean-ups – Case studies in contamination caused during remediation projects". ACLCA NSW AGM, Sydney
- Swane IC. May 2014. "Rolling out the NEPM – improve-ments, complexities and road blocks", Contaminated Land Conference, ASBG
- Swane IC. Sept 2013. "Assessment & remediation of radiological impacts from heavy mineral sand processing in WA", CleanUp 2013 Conference, Melbourne
- Swane IC. February 2013. "Case study – undertaking an environmental audit of heavy mineral sand contamination in WA", WA DEC Site Auditor Meeting
- Swane IC. June 2012. "Trends in Contaminated Land Management in NSW", Environmental Workshop, Regulation, Reporting & Management, Australian Sustainable Business Group
- Swane IC. Nov 2011 & June 2012. "Impacts on site audits & audit outcomes from NEPM changes", Contaminated Land Conference, Australian Sustainable Business Group (Sydney)
- Swane IC. August 2011. "Brownfield development, contaminated land and the planning system in NSW – Site Auditor's perspective". ALGA Sydney seminar
- Swane IC. March 2011 "Soil Investigation Levels for Radionuclide Contamination from Heavy Mineral Sand Processing". EcoForum March 2011, Sydney
- Swane IC. October 2010. "Cleaning up Clean-ups – Case studies in contamination caused during remediation projects". WA DEC Site Auditors Meeting, Perth
- Swane IC. October 2010. "Cleaning Up Clean-ups – Case Studies in Contamination caused during Remediation Projects", Presentation to WA Site Auditor Meeting, Perth
- Swane IC. Presented "Trends in Contaminated Sediment Remediation in the US: Sustainability Considerations" at EcoForum 2009 & ALGA seminars in Sydney & Newcastle
- Swane IC. 2009 "Reliability of Groundwater Computer Models Predicting the Fate of Petroleum Hydrocarbons". EcoForum 2009, Sydney
- Swane IC. 2007. "Contamination & Other Health & Environmental Risk Factors at the Beecroft Weapons Range and Strategies for Sustainable Use". Contamination CleanUp07, CRC CARE. Adelaide.
- Swane IC. 2007. "Investigation Levels for Residential Land Having Substantial Home-grown Produce in Australia". Contamination CleanUp07, CRC CARE. Adelaide
- Swane IC. September 2004. "Managing Contamination in Endangered Ecosystems – Mary Creek Headwaters Remediation Project". Contaminated Site Remediation Conference – Special Symposium on Defence Environmental Risk Assessment and Remediation. Department of Defence, Adelaide. 11 pages
- Swane IC., Webb, R., & Moss, D. 2003. "Dioxin Contaminated Sediments & Marine Ecology In Homebush Bay, Sydney". Second International Conference on the Remediation of Contaminated Sediments, Venice, 30 September – 3 October 2003
- Swane IC., Moss D & Webb R. 2003. "The Homebush Bay Dioxin Remediation Project, Sydney". Second International Conference on the Remediation of Contaminated Sediments, Venice, 30 Sept–3 Oct 2003
- Swane IC. 2001. "Homebush Bay Dioxin Remediation Project", GeoEnvironment 2001, 2nd Australia and New Zealand Conference on Environmental Geotechnics, Newcastle. Reprinted in Australian Geomechanics Journal, Vol. 36, No. 4, December 2001, pp 25-42

Dr Ian C Swane (CPEng, CEnvP, CSCS)

EPA SITE AUDITOR & SENIOR PRINCIPAL CONTAMINATED LAND ENGINEER

- Swane IC. 1999. "Cleaner Production – A Case Study on the Food and Automobile Industry", 3rd Philippine International Toxic and Hazardous Waste Congress, Manila.
- Geotechnical publications also made that are available on request.

IAN SWANE & ASSOCIATES P/L

ATTACHMENT 2
PRELIMINARY REVIEW FINDINGS

A. <u>Environmental Site Assessments:</u> My preliminary review findings are:

a) The data indicates that the main contaminant of concern is asbestos, which is present in fill at the site

b) The Alliance 2020 investigation found asbestos at 2 out of 102 boreholes (i.e. 2% of locations), while the Sydney Environmental Group ('**SEG**') 2022 investigation found asbestos at 25 out of 136 test pits (18% of locations). This difference in asbestos-hits is indicative of test pits exposing 200 times the amount of soil compared to boreholes

c) The presence of asbestos in 18% of the SEG test pits spread out across the site indicates that there is an unacceptable risk of asbestos contamination in fill at any location at the site and that it is not possible to identify all these locations by discrete sampling methods

d) Even though the SEG 2022 investigation was comprehensive and was able to use much better investigation techniques compared to Alliance[1], no amount of sampling can identify the location of all asbestos contamination at a site or define the areas where asbestos needs to be remediated. The presence of asbestos contamination under building slabs and pavements has not yet been investigated

e) My analysis of the Alliance data indicates that:

- While most sample locations were boreholes and not suitable for identifying the presence of asbestos, the borehole logs probably define the thickness of fill and whether foreign material is present; and
- Stratigraphic logs from the Alliance 2020 report were not provided in the copy provided to me.

f) My analysis of the SEG data indicates that:

- Most of the fill consists of soil having no foreign material present;
- A high proportion of fill logged as containing foreign material was contaminated with asbestos;
- Practically all asbestos contamination was located in fill where foreign material was present. Those few samples that weren't may be associated with errors in test pit logs;
- Foreign material in the fill layer does not occur in defined layers or with one soil type but as pockets in a range of soil types associated with the quality of imported fill brought to site by truck and moved around by earthmoving equipment. This needs to be considered when designing a selective excavation strategy;
- No evidence of waste burial pits were found although the risk remains;
- Most of the SEG test pits were terminated in fill and did not define the depth of fill. The risk of deeper contamination in fill needs to be considered; and

[1] I accept that the Alliance investigation was undertaken in 2020 when the campus remained active and was limited to boreholes

- It will be important that the investigation data provided by the NAA 2011, Coffey 2011 and JBS&G 2018 be reviewed and assessed by the site auditor.

B. RAP: My preliminary review findings regarding the Alliance 2022 RAP are:

a) The RAP reasonably defined the nature and extent of non-asbestos contamination at the site but was unable to define the location and extent of asbestos contamination at the site

b) The RAP concluded that the location and extent of asbestos contamination at the site could be defined through an additional investigation. This is not a valid conclusion due to the inability of discrete sampling methods to locate the presence of randomly distributed asbestos in the fill layer

c) The RAP estimated the volume of asbestos contaminated fill to exceed 47,600 m^3 (in-situ). In my opinion, this is a very unreliable estimate due to the limitations of the investigations performed, and the lack of data for fill underlying building / pavement slabs. It could be much high if poorly designed earthmoving methods were adopted

d) The proposed remediation technologies for asbestos contamination recommended by the RAP are a combination of off-site disposal and containment / capping with long term management using an LTEMP. In my opinion, other primary technologies need to be considered such as selective excavation of different fill materials, and on-site processing of fill containing ACM so the soil can be reused on-site

e) Off-site disposal should be restricted to materials where asbestos is concentrated, to highly asbestos contaminated soil where on-site processing is impractical, to ACM pipes/ pits, and as a contingency measure.

f) Containment / capping should be restricted, where possible, as a contingency measure and to materials that meet the Recreational C criteria in order to avoid the requirement for an LTEMP needing to be approved in writing by Council

g) The recommendations for further investigation work were good ones to address data gaps and deficiencies in the Alliance 2020 DSI. In my opinion, most of these data gaps were addressed by the SEG 2002 investigation, the exception being under building footprints / pavements

h) Consideration should be given to spreading a layer of loamy soil across the final surface of the site using on-site natural soils in order to satisfy the EPA criteria of no visible asbestos in surface soil

i) Data obtained by the Level 1 geotechnical compaction testing could be utilised in the validation program.

C. Demolition Plan: My preliminary review findings are:

a) It is likely that buildings constructed prior to 1987 contain asbestos in the form of cladding, roof eaves, electrical boards, etc. It is important that HAZMAT's for all at-risk buildings are undertaken in accordance with Australian Standards / regulatory requirements, all hazardous building materials are removed prior to the commencement of demolition work, and the clearance of asbestos fand other types of hazardous building materials be certified in accordance with regulatory requirements

b) Task 1 on the 'Erosion & Sediment Control Plan' (Beveridge Williams Dwg 012) requires '*All topsoil containing vegetation to be stripped from existing surface & stockpiled for respreading following completion of earthworks (approx.. 75mm thick)*'. This work should not be undertaken by the demolition contractor and should be left to the

earthworks contractor. There is a risk that material in this stockpile may contain visible asbestos. It is recommended that this stockpile not be respread following completion of earthworks unless it is validated as containing no visible asbestos. If there is a risk that this material contains some visible asbestos but at low concentrations less than Recreational C criteria (bonded ACM <0.02%, friable asbestos <0.001%), then consideration should be given to placing it in the central park 0.5m below the final surface levels. Natural loamy soil excavated from the central park area could be used to as topsoil to be spread across the site following completion of earthworks.

c) Task 2 on the 'Erosion & Sediment Control Plan' (Beveridge Williams Dwg 012) requires '*Stripped surface to be inspected & certified ready for fill placement by geotechnical engineer*'. This work should be done as part of the earthworks stage after demolition has been completed. There is a risk that the surface soils in some locations may contain visible asbestos. It is recommended that this risk be addressed by dividing the site into areas and for each area:

   i. Suitably trained workers under the supervision of a licensed occupational hygienist undertake a grid-survey in accordance with NEPM (2013) guidelines so that visible asbestos is removed and the occupation hygienist issues an Asbestos Clearance Certificate prior to the commencement of any earthworks; and

   ii. The Enviro undertakes a grid-survey in accordance with NEPM (2013) guidelines so that any other evidence of physical contamination or aesthetically impacted material is identified, excavated and placed in separate stockpiles for each material type. The contamination risks posed by the material in each stockpile is then to be assessed and remediated in accordance with the approach RAP.

d) The demolition plans show that many trees need to be protected. There is a risk that visible asbestos may be present in surface soils that are to remain around the protected trees and that an inspection and if necessary an asbestos clearance is required for the protected trees. The inspection should be undertaken once grass has been removed exposing the surface soils.

D. <u>Staging Plan:</u> My preliminary review findings are:

a) Advantages could be gained by contamination being remediated in a progressive manner consistent with the earthworks / infrastructure staging plan. This is because:

   i. The main contamination risks at the site (i.e. asbestos in fill, abandoned buried pipelines, aesthetically impacted fill, unexpected finds) can only be effectively located and remediated during the earthworks phase when the ground is open;

   ii. Minimise cash flow requirements by remediating only areas needed by the residential building staging plan; and

   iii. Minimise the risk of remediated areas being re-contaminated by site activities or through illegal fly tipping given that the project period likely to extend over several years.

b) Advantages could be gained in the central park located in Stage 2 should not be landscaped until all remediation work has been completed at the Site. This is because this area should be used to locate containment cells for soils that don't meet Residential A criteria or are aesthetically impacted. Preference should be given in placing soils in cells that meet Recreational C criteria and therefore don't require long-term management by means of a long-term environmental management plan (**LTEMP**).

c) Several Section A SAS's will need to be issued as stages of the site are remediated and earthworks are completed in a staged manner.

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Mirvac Homes (NSW) Pty Ltd
Level 28, 200 George Street
SYDNEY NSW 2000

Attention: Mr Arron Tanoai – Senior Development Manager

9/08/2024

Milperra_240809_IAA01
2024_Mirvac

Dear Arron

INTERIM SITE CONTAMINATION ADVICE FOR EARLY STAGE DEMOLITION WORK, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (7 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd ('**Mirvac**') with interim site contamination advice for the early stage demolition work at the Western Sydney University ('**WSU**') Milperra Campus located at 2 and 2a Bullecourt Road, Milperra (the '**Site**'). The advice is an extension of a methodology provided in a letter to Mirvac dated 24 May 2024[1].

In my opinion, the early stage demolition work can be a critical stage of a site remediation program for residential redevelopment projects. This is because there can be a high risk of asbestos building materials being spilt and unnecessarily contaminating both the ground surface and shallow soils around demolition work areas. Large sites that previously had minimal contamination issues then became significantly contaminated as a result of poor demolition practices. This finding is based on my experience gained over the past 15 years as a Site Auditor on NSW Government urban renewal projects at Minto, Claymore, Airds and Bonnyrigg.

2. Early Stage Demolition Work Advice

The advice provided in this letter only concerns work relevant to the management and remediation of site contamination. It is recommended that Mirvac integrates this advice with other project requirements.

Based on my understanding of the WSU redevelopment project as described in my earlier 24 May 2024 letter, I provide the following interim site contamination advice:

a) **Work Objective**: Minimise the volume of soil impacted by asbestos contamination by providing Mirvac and the demolition contractor with work protocols that limit the spread of asbestos and other forms of contamination from the demolition process and minimise the mixing of demolition waste with soil to the extent practicable.

[1] Ian Swane & Associates (24 May 2024) "*Proposal for Site Auditor Services, Redevelopment of Western Sydney University Milperra Campus for Residential Subdivision*". Document No: Milperra_240524_Proposal prepared for Mirvac. 25 pages

b) **Contractor Selection**:

i. Demolition Contractor: Mirvac should select a demolition contractor that is reputable, experienced and suitably licensed for the removal of asbestos from buildings and structures. The Contractor needs to have a proven track record in undertaking demolition work involving hazardous building materials in accordance with SafeWork NSW and Australian Standards procedures.

ii. Licensed Asbestos Assessor (**LAA**): Mirvac needs to ensure that a reputable, experienced, qualified and suitably licensed LAA is appointed to identify the presence and extent of hazardous materials in all buildings to be demolished. The LAA needs to be a suitably qualified occupational hygienist who is independent of the demolition contractor and preferably appointed and managed by Mirvac.

iii. Environmental Consultant (**Enviro**): Mirvac needs to ensure that a reputable, experienced and qualified Enviro is appointed to inspect excavations, collect soil samples and prepare validation reports for Stage 5 belowground work. The Enviro needs to be independent of the demolition contractor and preferably appointed and managed by Mirvac.

c) **Staging of the Demolition Work**: The demolition work should be staged to minimise the risk of contamination being generated by the work and to facilitate validation of hazardous material removal. The six stages are:

i. Stage 1: Work to be completed prior to commencement of site work;

ii. Stage 2: Work to be completed prior to commencement of aboveground demolition work;

iii. Stage 3: Aboveground demolition work;

iv. Stage 4: Pavements and ground slabs;

v. Stage 5: Foundations and buried services; and

vi. Stage 6: Reporting of contamination management during demolition work.

Staging of the work in the manner suggested above will also allow Mirvac to check the performance of the demolition contractor in terms of their management of hazardous materials during each work stage.

d) **Stage 1: Work to be Completed Prior to Commencement of Site Work**:

i. The LAA needs to complete hazardous materials building assessments (**HAZMATs**) for all structures needing to be demolished where there is a risk of hazardous building materials being present. The assessments need to be documented in reports prepared in accordance with NSW SafeWork and Australian Standard requirements and represent good industry practice. The HAZMATs need to provide detailed information on all accessible hazardous materials to be removed from aboveground structures prior to demolition. The HAZMATs also need to provide detailed information on the likelihood of difficult to access hazardous materials that may be encountered during demolition work. Copies of HAZMATs need to be provided to the Site Auditor if required.

ii. The LAA needs to inspect the ground surrounding all aboveground structures to be demolished, document any visible asbestos or other forms of contamination that may be present, and manage the removal of all visible asbestos. The results of ground inspections are to be documented in reports that include asbestos clearance certificates prepared in accordance with SafeWork NSW requirements. These certificates need to certify that no visible asbestos was present around the structures where demolition work is to occur. Copies of these reports need to be provided to the Site Auditor if required.

iii. The demolition contractor needs to prepare a materials tracking plan that will track all hazardous building materials and demolition waste from cradle-to-grave. The procedure needs to generate sufficient documentation that will allow a Site Auditor to conclude that all demolition waste was removed from the site and disposed at appropriately licensed facilities in accordance with EPA requirements. The procedure needs to be approved by Mirvac.

iv. The demolition contractor needs to prepare a work plan covering the demolition procedures / protocols to be used. These procedures need to include, among other things, how previously inaccessible hazardous materials would be identified and removed following the commencement of demolition work.

v. All other work plans need to be prepared by the demolition contractor in accordance with regulatory and industry requirements and approved by Mirvac.

vi. All regulatory licenses and approvals required by the demolition work need to be obtained, with copies to be provided to Mirvac so they are available to the Site Auditor if required.

vii. All environmental and safe work control measures need to be installed.

viii. Mirvac to obtain all available data on buried services located across the site, but particularly in demolition work areas. Buried services that may contain asbestos or other waste materials need to be identified and documented on plans provided to the demolition contractor (e.g. Telstra pits, conduits, stormwater pipes). Copies of these plans are to be provided to the Site Auditor if required.

ix. Mirvac should consider restricting the demolition contractor to only access those parts of the site sufficient to allow the demolition work to proceed in an efficient manner. This would help prevent the spread of demolition waste outside demolition work areas, prevent unnecessary disturbance of ground outside the demolition work area, and facilitate inspections needing to be undertaken by Mirvac site personnel and the LAA. These work areas could be defined by star picket / tape fencing or similar together with appropriate signage.

x. Mirvac need to commence documenting site work by completing daily records and taking a photographic record of site conditions relevant to environmental and site contamination management. This documentation is to be made available to the Site Auditor if required. This work needs to continue throughout the period of the demolition work.

e) **Stage 2: Work to be Completed Prior to Commencement of Aboveground Demolition Work**:

i. All accessible hazardous building materials, chemicals and dusts need to be safely removed from aboveground structures prior to their demolition in such a way that there is no spillage or release of hazardous materials into the environment. All such materials need to be tracked from cradle-to-grave by the demolition contractor in accordance with the approved material tracking plan.

ii. All hazardous materials removed from a structure are to be immediately placed in secure bins that are securely covered and located in a designated, secure area sealed by concrete or asphalt pavement. Appropriate safety signs need to be erected and maintained in this area. No hazardous materials are to be dropped on the ground, allowed to generate dust, placed in stockpiles or left in the open. All hazardous materials placed in bins are to be classified and disposed at appropriately licensed waste facilities in accordance with EPA requirements as soon as practicable.

iii. Following the removal of all accessible hazardous materials from an aboveground structure / work area, the LAA is to inspect the structure and ground surface surrounding the structure and verify that all accessible hazardous materials have been removed by the demolition contractor and that no visible asbestos or other form of contamination remains on the ground surface. This result needs to be documented by the LAA in a clearance certificate prepared in accordance with regulatory requirements. Copies of these clearance certificates need to be provided to the Site Auditor if required.

f) **Stage 3: Aboveground Demolition Work**: This work includes the parts of a structure located above the concrete ground slab and does not include pavements:

i. Mirvac and the demolition contractor should at all times during demolition work assume that suspect asbestos containing material (**ACM**) actually contains asbestos unless testing shows otherwise.

ii. The aboveground demolition work should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Avoid disturbance of the ground;
- Avoid unnecessary damage to pavements, since these should remain in place until after aboveground structures in a work area have been removed;
- Are capable of identifying then safely and securely removing previously inaccessible hazardous materials;
- Ensure no hazardous materials are spilt on the ground or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;

- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan; and
- Remove all demolition waste generated by the aboveground demolition work prior to the LAA doing a site inspection.

iii. After all waste generated by the aboveground demolition work has been removed from a work area, the LAA is to inspect the ground surface across the work area and verify that all demolition waste and hazardous materials have been removed by the demolition contractor and that no visible demolition waste, asbestos or other form of contamination remains on the ground surface. This result is to be documented by the LAA in a clearance certificate prepared in accordance with regulatory requirements. Copies of these clearance certificates are to be provided to the Site Auditor if required.

g) **Stage 4: Pavements and Ground Slabs**:

i. Pavements and ground slabs should only be removed from a work area after aboveground structures have been removed down to the ground slab and all waste generated by the aboveground demolition work has been removed from the area.

ii. The demolition of pavements and ground slabs should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Minimise disturbance of the underlying ground;
- Are capable of identifying then safely and securely removing previously inaccessible hazardous materials (e.g. bonded asbestos sheeting used for ground slab formwork);
- Asbestos pipes / pits uncovered by the pavement and ground slab demolition work should not be disturbed below the pavement / ground slab at this time but only be identified and the area secured;
- Ensure no hazardous materials are spilt on the ground or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;
- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan; and
- Remove all demolition waste generated by the pavement / ground slab demolition work prior to the LAA doing a site inspection.

iii. After all waste generated by the pavement / ground slab demolition work has been removed from a work area, the LAA is to inspect the ground surface across the work area and verify that all demolition waste and hazardous materials have been removed by the demolition contractor and that no visible asbestos or other form of contamination remains on the ground surface. This result is to be documented by the LAA in a clearance certificate prepared in accordance with

regulatory requirements. Copies of these clearance certificates are to be provided to the Site Auditor if required.

h) **Stage 5: Foundations and Buried Services**: All foundations and buried services in demolition work areas should be removed due to the risk of hazardous materials being present in / around these structures, or contamination being present in backfill underlying / surrounding these structures. Data on the presence of belowground hazardous materials would be available from the Mirvac underground services assessment and data collected by earlier demolition work.

i. Foundations and buried services should only be removed from a work area after pavements and concrete ground slabs have been removed and all waste generated by this demolition work has been removed from the area.

ii. The demolition of foundations and buried services should use procedures that:

- Meet SafeWork NSW and Australian Standards requirements;
- Minimise disturbance of surrounding ground;
- Are capable of identifying then safely and securely removing hazardous materials (e.g. ACM pits, conduits, pipelines);
- Ensure all hazardous materials are removed and that no hazardous materials are spilt or hazardous dusts are generated. All hazardous materials are to be placed in secure bins as mentioned in Point e(ii);
- Avoid demolition waste been spread across the work area;
- Avoid the mixing of demolition waste with other materials;
- Allow demolition waste to be tracked from cradle-to-grave in accordance with the approved materials tracking plan;
- Remove all demolition waste generated by the foundations and buried services demolition work;
- Place excavated soils beside trenches and excavated areas so that the Enviro can inspect final excavated surfaces; and
- Trenches / excavations are preferably not to be backfilled by placing warning fences around these areas.

iii. The Enviro needs to inspect all excavations, collect validation samples and certify that excavations are free of contamination. If contamination is found, it is to remain undisturbed and its location records. The validation work and reports need to be prepared by the Enviro in accordance with EPA guidance, with copies to be provided to the Site Auditor.

i) **Stage 6: Reporting of contamination management during demolition work**: Following the completion of demolition work in a work area, Mirvac or their Enviro should prepare a report documenting the aspects of the demolition work relevant to a site audit. These aspects should include, but not be limited to:

- Provide details of the contractors who undertook work and provide copies of licenses, approvals, notifications;

IAN SWANE & ASSOCIATES P/L

- A description of the work undertaken in each stage supported by photos and copies of site records;
- Environmental protection measures that were implemented;
- Provides copies of HAZMATs and LAA clearance reports;
- An assessment of materials and quantities of demolition waste generated;
- Provides copies of waste classification reports where required;
- Provide a copy of the materials tracking plan;
- Provide copies of documentation generated by materials tracking; and
- Provide a copy of validation reports prepared by the Enviro for the validation of excavations made for the removal of foundations and buried services.

I suggest that soon after the demolition work is underway, Mirvac formally engages the NSW EPA site auditor for the project and that I undertake a site inspection and meeting with Mirvac to review and discuss the implementation of my interim advice. Meanwhile, please don't hesitate to contact me should you require any further advice.

Yours sincerely



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Level 28, 200 George Street
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Attention: Mr Nibraas Ahmad – Development Manager

5 June 2025

SA316_250605_IAA03
SA316

Dear Sir

INTERIM AUDIT ADVICE ON CLASSIFICATION OF REMEDIATION WORK UNDER SEPP R&H, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (4 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd (**Mirvac**) with interim audit advice as part of non-statutory Site Audit No. 316 being undertaken by Dr Ian Swane, a NSW Environment Protection Authority (**EPA**) Site Auditor accredited under the Contaminated Land Management Act 1997 (**CLM Act**). The land the subject of this site audit (i.e. the **Site**) was formerly the Western Sydney University '**WSU**) Milperra Campus located at 2 and 2a Bullecourt Road, Milperra and legally defined as Lot 2 DP1291984 and Lot 1 DP101147. The Site covers an area of 18.83 ha. Remediation of low levels of asbestos contamination needs to be undertaken to make the Site suitable for the proposed residential development.

The purpose of this letter is to provide the Site Auditor's opinion on the classification of remediation work required as part of the proposed residential housing development under State Environment Planning Policy (Resilience and Hazards) 2021 (**SEPP R&H**).

This interim audit advice is considered to be consistent with EPA guidelines and policy and does not pre-empt conclusions to be drawn at the end of the site audit process. This interim audit advice does not represent a site audit statement ('**SAS**') or report ('**SAR**') that are intended to be prepared at various stages throughout the audit period as development stages are completed.

2. Background Information on Proposed Remediation Work

The latest version of the remediation strategy proposed for the Site and provided to the Site Auditor is documented in a Remediation Action Plan (**RAP**) prepared by the Sydney Environmental Group (**SEG**) dated 15 January 2025 titled *'Remedial Action Plan, Western Sydney University - Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW*'.

The remediation goal adopted by the RAP[1] is to remediate contamination to a level that does not present an unacceptable human health exposure and environmental risks, based on the

[1] Executive Summary & Section 10.1, RAP

proposed land use setting. All remedial works will be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (**EMP**).

The Site Auditor considers that achievement of this remediation goal will require all contamination exceeding remediation criteria to be either treated on-site to a condition suitable for reuse or removed from the Site and disposed at a suitably licensed waste facility. The placement of contaminated materials exceeding the remediation criteria into on-site containment cells would not be allowed. This will mean that the Site will need to be remediated to a condition suitable for the proposed land uses without any constraint, and that the Consent Authority will not be required to review and approve an EMP.

The Site Auditor notes that the RAP[2] lists a range of alternate technologies for remediating contamination at the Site. These include:

- Excavation and off-site disposal;
- On-site treatment and beneficial reuse; and
- On-site containment and management.

3. Classification of Remediation Work

The RAP[3] advises that proposed remediation works would likely be classified as Category 2 under SEPP R&H, which do not require consent from the Consent Authority. The Site Auditor agrees with this conclusion when the remediation technologies are restricted to excavation and off-site disposal, and on-site treatment and beneficial reuse. This is because the use of these two remediation technologies would not trigger any features of Category 1 remediation work specified in Section 4.8 of SEPP R&H.

Features of Category 1 remediation work specified by SEPP R&H are:

a) designated development, or

b) carried out or to be carried out on land declared to be a critical habitat, or

c) likely to have a significant effect on a critical habitat or a threatened species, population or ecological community, or

d) development for which another State environmental planning policy or a regional environmental plan requires development consent, or

e) carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument—

   i. coastal protection,

[2] Executive summary & Section 9.4, RAP
[3] Section 10.3.1.1, RAP

ii. conservation or heritage conservation,

iii. habitat area, habitat protection area, habitat or wildlife corridor,

iv. environment protection,

v. escarpment, escarpment protection or escarpment preservation,

vi. floodway,

vii. littoral rainforest,

viii. nature reserve,

ix. scenic area or scenic protection,

x. wetland, or

xi. carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Minister).

With regard to Condition (e)(xi) in SEPP R&H, the current contaminated land planning guidelines were issued by the City of Canterbury Bankstown (**Council policy**) dated 22 August 2017. Relevant features of the Council policy include:

- Category 1 and 2 remediation works are defined in Section 3 using the same definitions as used in SEPP R&H;
- All Category 2 remediation work must be conducted in accordance with the site management provisions specified in Section 4 of Council policy. Category 2 remediation work that does not comply with these provisions will be classified as Category 1 remediation work and will require consent; and
- On-site containment or capping is not permitted to be undertaken under Category 2 and requires development consent (Section 4.1.12, Council policy).

In my opinion, the remediation strategy specified in the RAP meets Council's policy for Category 2 remediation work if the works only use methodologies consistent with the remediation goal specified in the RAP.

This would mean that the remediation technologies to be used at the Site would be restricted to excavation and off-site disposal, and on-site treatment and beneficial reuse. On-site containment and management could not be used unless this technology was subject to a later development application and approval by the Consent Authority.

To ensure that the remediation goal stated by the RAP is achieved, the Site Auditor proposes that the site be remediated to a standard that would only allow a Section A1 SAS / SAR to be issued for each stage of the development, unless a change is made that is the subject of a follow-up development application and approval by the Consent Authority.

4. Recommendation

Section 4.11 of SEPP R&H advises that Category 2 remediation work would not need consent if the requirements in this section of the SEPP are met. The Site Auditor considers that consent for remediation work at the Site would not be required if:

1. The Site is remediated to a standard that allows the Site Auditor to only issue a Section A1 SAS / SAR for each stage of the development. This would mean that the remediation technologies to be used at the Site would be restricted to excavation and off-site disposal, and on-site treatment and beneficial reuse;
2. Mirvac gives the Consent Authority at least 30 days' notice before the commencement of remediation work, which is a requirement of Section 4.13(2)(a) of SEPP R&H;
3. The remediation work meets the requirements of Section 4.11 of SEPP R&H; and
4. The remediation work is conducted in accordance with the RAP and Section 4 of Council policy.

Alternatively, if Mirvac wants to include the remediation work in a consent for the proposed residential development, then the Site Auditor recommends that the following condition be included in the Development Consent:

> *"The site must be remediated to a standard that allows the Site Auditor to only issue a Section A1 SAS / SAR for each stage of the development, unless a new development application is made and approved by the Consent Authority allowing a change in remediation technology and the issuing of a Section A2 SAS / SAR.*

Yours sincerely

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Mirvac Homes (NSW) Pty Ltd
Level 28, 200 George Street
SYDNEY NSW 2000

Attention: Mr Nibraas Ahmad – Development Manager

25 September 2025

SA316_250925_IAA04
SA316

Dear Sir

INTERIM AUDIT ADVICE ON EGA 2025 DSI, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (18 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd (**Mirvac**), Beveridge Williams (**BW**) and the environmental consultant EGA with interim audit advice as part of statutory Site Audit No. 316 being undertaken by Dr Ian Swane, a NSW Environment Protection Authority (**EPA**) Site Auditor accredited under the Contaminated Land Management Act 1997 (**CLM Act**). The land the subject of this site audit (i.e. the **Site**) was formerly the Western Sydney University (**WSU**) Milperra Campus located at 2 and 2a Bullecourt Road, Milperra, legally defined as Lot 2 DP1291984 and Lot 1 DP101147. The Site covers an area of 19.64 ha.

The purpose of this letter is to provide the Site Auditor's review comments on a report prepared by the environmental consultant EGA dated 26 August 2025 titled "*Phase 2 Assessment – Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*". The comments reflect an assessment of the data provided in the EGA report, which also considers earlier data presented in all available site contamination assessments prepared for the Site since 2011. The comments provided herein include previous comments issued by the Site Auditor by email between 11 and 18 September 2025.

This interim audit advice is considered to be consistent with EPA guidelines and policy and does not pre-empt conclusions to be drawn at the end of the site audit process. This interim audit advice does not represent a site audit statement (**SAS**) or site audit report (**SAR**) that are intended to be prepared at various stages throughout the audit period as development stages are completed.

2. Site Auditor Overview

The Site Auditor has reviewed in detail all 11 available reports prepared since 2011, including the SEG 2024 and EGA 2025 DSIs. The reports reviewed are listed in **Appendix A**.

A database prepared by the Site Auditor from the available reports show that contamination has been assessed at 347 locations comprising 146 boreholes and 201 test pits. Of these 347 locations:

- Borehole and test pit logs have been prepared for 304 locations;

- The number of locations where samples of fill have been collected and tested for the contaminants of potential concern (**CPOCs**) are: asbestos 282, metals 190, PAHs 162, petroleum hydrocarbons (TRH / BTEX) 156, organochlorine pesticides (OCPs) 131, PCBs 52 and organophosphate pesticides (OPPs) 47; and
- The number of locations where samples of natural soil have been collected and tested for the CPOCs are: metals 42 and PAHs/TRH/BTEX 38.

The Site Auditor considers that a large amount of data has been obtained that shows that the main contamination issue needing to be addressed is the presence of small fragments of bonded asbestos that are randomly distributed in fill across most parts of the Site. The data indicates that the only areas where such contamination is unlikely to be present in any significant quantity (apart from possible abandoned buried services) are:

- The sports field in the southern part of the Site, since construction involved the excavation of natural soils and the placement of a thin topsoil layer;
- The Conservation Reserve in the NE corner of the Site (excluding the former childcare facility), where no development has occurred after 1974 when the tertiary facility became established; and
- The two main carparks and main roadway, since construction generally involved the stripping of topsoil and the placement of an asphalt pavement on the underlying natural clay soil.

Given the likely pattern of contamination , it is not feasible to try and identify all areas where asbestos fragments are present in fill. It should be noted that the 347 locations already investigated represents less than 0.2% of the Site area[1].

The best outcome that can be achieved is to identify the areas where asbestos fragments are frequently present in fill, which can be defined by investigation and then remediated. As far as the other parts of the Site are concerned, procedures will need to be incorporated into the post-remediation phase of work that will be able to remove asbestos fragments as they present themselves during bulk earthworks.

In my opinion, the available investigation data has resulted in the reasonable quantification of the location and extent of significant contamination at the Site needing to be remediated so that, following the completion of the remediation work, the risk of unknown significant contamination should be low and capable of being addressed by the use of normal environmental construction practices adopted during bulk earthworks.

However, two caveats to this conclusion are that the EGS (August 2025) DSI advises that:

- A large quantity of asbestos contaminated soil (2,262 m^3) was found across building footprints after buildings were demolished. Until reading the EGA report, the Site Auditor was unaware that such a large amount of asbestos contaminated soil had been found and removed from building footprints; and

[1] Based on each borehole having a 100mm diameter and each test pit being 0.6m wide and 3.0 m long

- A large quantity of asbestos contaminated soil (4,156 m^3) was excavated from the southern part of the Site (AEC02). Until reading the EGA report, the Site Auditor was unaware that such a large amount of asbestos contaminated soil had been found, excavated and stockpiled.

Detailed information on this work needs to be included in the revised EGA report.

While the Site Auditor considers that a large amount of sampling data has been provided by the ESAs, the contamination assessments documented in the EGA 2025 DSI need further work in order to support the preparation of a practical and efficient remediation strategy. The review comments provided by the Site Auditor below seek to facilitate EGA in addressing these deficiencies in a revised report.

3. Site Auditor Review Comments

The Site Auditor has identified matters that need to be addressed by EGA in a revised report. These matters are:

1. Title Page: The date of the report needs to be changed to correspond to the date the revised DSI is actually completed and issued, together with an updated revision number.
2. Document Record: Refer Comment 1.
3. Executive Summary:
   a) The Beveridge Williams (24 July 2025) "*Master Staging Plan*" shows the total area of all stages of the Site as 19.64 ha. The area of the Site used in the EGA report needs to be up-dated, or the report should otherwise advise why the size of the Site occupies a different area.
   b) The NSW EPA (2020 "*Reporting Guideline*" advises that a detailed site investigation (**DSI**) "*must, among other things, be designed to provide information on the type, extent and level of contamination for the site*". Consequently, the first objective of the DSI mentioned in third paragraph should be revised to read "*Determine the type, extent and level of contamination at the site as a result of past and current land use activities.*"
   c) Update the conclusions documented in the Executive Summary to address changes made in Section 16.
4. Section 1.1 Background: Refer Comment 3(a).
5. Section 2 Site Identification: The current zoning plan shows that no part of the Site is zoned SP2 – Infrastructure (Educational Establishment), with such zoning made for the Mount St Joseph High School located to the SE of the Site. Correct Table 2.1.
6. Section 3 Objectives: Refer Comment 3(b).
7. Section 1.4 Scope of Work: The report advises that the additional DSI sought to address data gaps in past investigations conducted at the Site that remained to be addressed. Consequently, the first dot point should be revised to read "*Review the previous contamination assessments and identify data gaps that need to be addressed."*

8. Section 4 Aerial Imagery: Table 4.1.1 needs to also mention the industrial land uses that have occurred to the east and north of the Site and the development of Council's Kelso Landfill located just south of the M5 Motorway and how it has accepted putrescible waste for over 75 years.
9. Section 7.1 Potential Areas of Environmental Concern:
    a) The report should advise that AEC06 corresponds to the contamination risks posed by LFG migrating from Council's Kelso Landfill to the southern part of the Site. This risk was identified by the Alliance 2020 DSI but no investigation and assessment has been done by any of the available reports.
    b) The inclusion of LFG risks posed by Council's Kelso Landfill also needs to be addressed by including additional potential contamination pathways.
    c) Table 7.1.1 needs to also include the contamination risks posed by buried services constructed from bonded asbestos and possibly containing waste materials. Note that the presence of such pipes was a big issue for the remediation of the nearby Mirvac Riverside Residential Development. There is a risk that abandoned septic tanks may remain at the Site from the time it was used for a semi-rural land use. COPCs include heavy metals, TRH, BTEX, PAHs, OCPs, asbestos and pathogens.
    d) Section 10.1 of the report advises that "*Although recognised as a potential contaminant pathway, groundwater was not assessed in the current investigations, but is planned for assessment in further works*." Explain why EGA considers that further groundwater investigations need to be undertaken at the Site. Don't you think the groundwater investigation conducted by the Alliance 2020 DSI shows there is a low risk that contaminated groundwater is present at the Site and the any contaminated groundwater that may be present doesn't affect the suitability of the Site for low-density residential land use? If EGA considers that no additional groundwater investigation, then Section 7.1 of the report should advise why groundwater contamination is not considered to be an AEC and remove AEC07 from Table 7.1.1. On the other hand, if EGA considers that additional groundwater investigations are required, then the report should provide more detail justifying the need for the additional investigation.
10. Section 7.2 Land Use Setting: The report should mention the semi-rural agricultural activities that occurred at the Site prior to 1974 when the Site began to be used for tertiary education.
11. Section 7.7 Inhalation / Vapour Intrusion – Human Health: The report should also mention that LFG risks posed by Council's Kelso Landfill also need to be addressed.
12. Section 7.8 Aesthetics:
    a) The report should mention that EPA guidance requires no anthropogenic odours or staining in soils / groundwater remaining at the Site. Also no putrescible waste or soil containing animal residues (Section 3.6.3, NEPL Schedule B1).
    b) The report should mention that inert waste in soil at a low-density residential site should be limited to trace concentrations (<5%). This concentration is based on the Australian Standard for Geotechnical Soil Classification, which defines "trace"

constituents in soil as being < 5%. Also note that the ENM 2014 Order requires ENM to contain at least 98% natural soil.

c) Include the need for the development to remove abandoned buried services and structures.

13. Section 8 Site Assessment Criteria: Correct the section title spelling.

14. Section 9.7.1 Sampling Point Density and Locations:

a) In paragraph 3, the report makes reference to the WA DoH 2009 guidelines. Update this reference to the WA DoH (2021) asbestos guidelines, since the NSW EPA[2] has accepted most parts of the 2021 version.

b) Section 5.3 of the WA DoH (2021) "*Asbestos Contaminated Sites in WA Guidelines*" provides three categories of asbestos risk at a site, these being:

- "Suspect" on land having the following characteristics: uncontrolled fill with building waste, dumped waste material and/or demolished structure footprints (pre-1987). In this case the recommended sampling frequency corresponded to the number of locations given by the EPA (2022) "Sampling Design Guidelines" using a systematic approach that was dependent on the size of the area being investigated; or
- "Likely" on land having the following characteristics: industry associated with asbestos, some isolated asbestos found and/or landfill present. In this case the recommended sampling frequency corresponded to double the number given by EPA guidelines using a systematic sampling approach; or
- "Known" on land where asbestos had been identified and needed further delineation. In this case, judgmental graduated targeted sampling for linear extent and depth was required.

The report should advise that a "suspect" category was appropriate for investigating asbestos contamination at the Site. This means that the minimum sampling frequency would correspond to Table 2 in the NSW EPA (2022) Sampling Design Guidelines.

c) The report should advise that there is a risk that asbestos contamination could be present on the ground surface and/or buried in fill anywhere at the Site due to:

- The past semi-rural use of the Site (pre-1974) where agri-waste and building and demolition (**B&D**) waste may have been buried anywhere at the Site;
- The importation of fill (1974 – 2020's) from unknown sources for the development of tertiary educational facilities at the Site, with fill being spread across much of the Site;
- The use of hazardous building materials for the construction of buildings in the early stages of the university development, with the potential for building waste to have been spilt and/or buried at the Site; and

[2] https://www.epa.nsw.gov.au/Your-environment/Contaminated-land/other-contamination-issues/managing-asbestos-in-and-on-land

- The demolition of buildings as part of subsequent university development.

d) The report should advise that because of this risk, the sampling locations adopted by the SEG 2024 and current investigation conducted by EGA were designed to identify the location and extent of significant contamination at the Site, so that the risk of unknown significant contamination remaining after the completion of remediation work is low and capable of being addressed by the use of normal environmental construction practices adopted during bulk earthworks.

e) Explain how the EGA 2025 DSI derived the location and extent of the AECs shown in Figure 2. Explain why the AECs do not include:

- The Conservation Reserve and the former childcare facility in the NE corner of the Site;
- The two large carparking areas and the main road entering the Site;
- The areas between buildings not part of the green shaded AEC01;
- The former UST are in the eastern /central part of the Site;
- The sports field in the southern part of the Site; and
- The embankments adjacent to the sports field in the southern part of the Site.

f) For AEC01, the report mentions that an additional 24 sample locations were investigated. However, the actual number was 20. Correct the report and advise why an additional 20 locations were investigated.

g) For AEC02, the report mentions that an additional 54 sample locations were to be investigated. However, the actual number was 52. Correct the report and advise why an additional 52 locations were investigated.

h) For AEC03, the report mentions that an additional 84 sample locations were to be investigated. However, the actual number was 52. Correct the report and advise why an additional 52 locations were investigated.

i) For AEC05, the report mentions that an additional 47 sample locations were to be investigated. However, the actual number was 46. Correct the report and advise why an additional 46 locations were investigated.

j) Explain why the SEG 2024 DSI and the EGA 2025 DSI did not investigate the other AECs mentioned in point (e) above.

k) Figures 3 to 9 include sample locations that were not investigated. Ensure these figures are corrected.

15. Section 9.7.2 Sampling Methodology:

a) Describe in detail the sampling methodologies used by the SEG 2024 DSI and the EGA 2025 DSI.

b) Explain why some of the fill samples tested for asbestos by the SEG 2024 DSI did not target fill containing foreign materials that pose a higher risk of being contaminated by asbestos.

c) Describe the procedures used for excavating test pits. Were DBYD surveys done prior to excavation? Was a buried services locator used to clear each sampling

location. How were test pit locations located? Were the coordinates of sample location measured by GPS? If so, include the coordinates on the test pit logs.

d) Describe the procedures used to examine excavated fill for evidence of foreign materials and visible asbestos.

e) Correct Table 9.7.1 to exclude sampling points that were not sampled.

f) Update the reference to the 2021 WA DoH guidelines, since the NSW EPA has accepted most parts of the 2021 version.

g) Describe the procedure used for gravimetric asbestos field testing.

16. Section 10.1 Scope of Fieldworks:

a) Correct the number of samples that were actually lab tested.

b) The report advises that "*Although recognised as a potential contaminant pathway, groundwater was not assessed in the current investigations, but is planned for assessment in further works.*" Explain why EGA considers that further groundwater investigations need to be undertaken at the Site. Don't you think the groundwater investigation conducted by the Alliance 2020 DSI shows there is a low risk that contaminated groundwater is present at the Site and the any contaminated groundwater that may be present doesn't affect the suitability of the Site for low-density residential land use? If EGA considers that no additional groundwater investigation, then the seventh dot point should be removed from the report. On the other hand, if EGA considers that additional groundwater investigations are required, then the report should provide more detail justifying the need for the additional investigation.

17. Section 10.2 Laboratory Analysis:

a) The report advises that Eurofins was used for the analysis of primary samples. However, the report also includes lab test certificates where ALS tested primary samples.

b) Advise which lab was used as the secondary lab.

18. Section 11.1.1 AEC01, AEC02 and AEC03 – Friable and Non-Friable Asbestos Impacts:

a) Provide details on the grid-based inspection walkover procedures that were used. What size were the areas inspected? Did the grid-based walkover comply with the procedures given in Section 11.2.2 of the NEPM (2013) Schedule B2 guidelines? Explain how the top 10 cm of soil was inspected? What type of rake was used?

b) Provide details on who did the grid-based walkover and how long each inspection took at each AEC.

c) Describe the condition of the ground surfaces and the type and extent of vegetation present. Provide summarises of the observations made. Was any physical evidence of contamination found? If so, provide details and show the locations on figures. Provide copies of photos taken during these inspections. Provide in the report copies of the original field notes taken.

d) If a grid-based inspection walkover was not undertaken, then reference to the inspection walkover should be removed from the report.

e) The report should mention whether any DBYD check was done and whether a buried services locator was used to clear designated test pit locations.

f) Correct the number and ID of sample locations that were actually sampled.

g) Advise whether the coordinates of each sample location were recorded. If so, what type of GPS was used? Include the grid coordinates on the test pit logs.

h) Update the reference to the 2021 WA DoH guidelines, since the NSW EPA has accepted most parts of the 2021 version.

i) The NEPM (2013) guidelines (Section 4.10, Schedule B1) recommend that when using lab method AS4964 is used to detect the presence of asbestos in soil, "The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction". Please advise why the samples collected by EGA at AEC05 generally weighed 50 – 70 g, which suggests that the sample volumes were well below 500 mL.

j) Explain why portions of AEC03 were inaccessible at the time of the investigation.

k) The report advises that "*Roads and services within the site were to be preserved for accessibility during the demolition process. As such, EGA could not access / sample where hardstand or potential services were located*." The report needs to advise whether there is a risk of asbestos contamination under the carparks and main roadways given the data provided by the previous investigations. If there is a low risk of asbestos contamination, then the report should mention this.

19. Section 11.1.2 AEC01 – Friable Asbestos Delineation Sampling:

    a) Explain why EGA considers that the friable asbestos found by samples SS10 and BH39 was due to mechanical excavation via drilling when these two samples were collected in surface soils that would have been grab samples and not collected by drilling.

    b) The report should advise that the asbestos found at SS10 and BH39 was weathered asbestos fragments that remained at the ground service. Because of this, the friable description of the asbestos at these two locations is not representative of asbestos found buried in the fill layer.

    c) Detail the depths where soil samples were collected.

    d) The report advises that "*Field observations such as lithology, odours, staining, depth of water etc. were noted on the logs (for EBH2, EBH3, EBH5, SS10 and BH39)*", with copies of the logs presented in Appendix A of the report. Copies of these logs are missing. Include copies of these logs in the report if field records showing the stratigraphic conditions encountered at these locations are still available in the EGA files. In this event, separately provide the Site Auditor with hard copies of the EGA field records. If logs for these locations were not prepared, then revise the report accordingly.

20. New Section 11.1.3 Removal of Asbestos Contaminated Soil from Building Footprints: Section 11.6 of the report advises that "*Non-friable asbestos impacted soils encountered within AEC05 during completion of the demolition scope for site across 2024 and 2025 were partially remediated to facilitate continuation of the works in those areas.*" The

report needs to provide detailed information on the excavation and stockpiling work that was undertaken across the building footprints. This information should include, but not be limited to:

a) Describe the soil conditions that were encountered across building footprints as they were revealed during demolition work. What data supports the EGA comment that only non-friable asbestos impacted soil was present at building footprints? What is the risk that friable asbestos was also present?

b) Describe the laydown mechanism that caused asbestos contaminated soils to be present at the building footprints.

c) When was asbestos contaminated soil below buildings first encountered during demolition work at the Site and when was it decided that asbestos contaminated soils needed to be excavated from these areas. Advise whether SafeWork NSW was advised of the need to undertake this work, and provide a copy of any notification issued to SafeWork NSW.

d) Describe the purpose of the excavation work. Was it to remove all visible asbestos so the demolition work areas were made safe, as required by the WH&S Regulation?

e) Describe the excavation procedures used to remove asbestos contaminated soil from across building footprints. Advise whether the soil excavation work was undertaken in accordance with SafeWork NSW requirements.

f) Identify the buildings footprints where soil was excavated. Provide details on the areas, depth and volume of asbestos contaminated soil excavated from each building footprint.

g) Provide a figure showing the locations of building footprints where asbestos contaminated soils were excavated. If Figure 10 is this figure, then it should be referenced in this new section.

h) Identify on Figure 10 the footprints of Structure 1, Building 4, Building 5 and Building 10 where asbestos contaminated soils were reported to have been found (as mentioned in Section 11.5).

i) Describe how and where asbestos contaminated soil removed from building footprints was stockpiled. What were the reasons for stockpiling asbestos contaminated soil at these locations? Describe the stockpile design and the environmental protection measures being used to ensure the stockpile area remains safe.

j) Describe the current condition of each stockpile supported by photos.

k) Figure 10 shows that nine stockpiles of asbestos contaminated soil were formed from excavations at building footprints. The figure needs to provide a unique identifier for each stockpile together with the volume of stockpiled material.

l) Provide details of the asbestos fibre air monitoring conducted for this work. Where were monitors located and provide a summary of the monitoring results. Provide copies of air monitoring reports.

m) Describe how asbestos contaminated soil was removed from building footprints and transported to the stockpile area. Was a common transportation route used or multiple routes?

n) Describe the environment procedures used to minimise the risk of asbestos contaminated soil being spilt and contaminating other parts of the Site.

o) Describe the material tracking procedures used and provide copies of material tracking documentation in an appendix.

p) Provide a figure showing the routes used to transport asbestos contaminated soil from building footprints to the stockpile area.

q) Assess the risk of asbestos contaminated soil removed from building footprints contaminating other parts of the Site.

r) Advise whether an occupational hygienist provided asbestos clearance certificates for each building footprint after the soil was excavated. If available, provide copies of these certificates.

s) Assess the risk of asbestos contaminated soil being present outside the perimeter of building footprints and whether there is a need to consider all soils within a 10m perimeter of buildings as asbestos contaminated.

t) Provide copies of field records and photos prepared by environmental consultants / occupational hygienists for this work.

21. New Section 11.1.4 Excavation of Asbestos Contaminated Soil at Southern Area: The EGA 2025 DSI reports that a large quantity of asbestos contaminated soil (4,156 m^3) was excavated from the southern part of the Site (AEC02). Until reading the EGA report, the Site Auditor was unaware that such a large amount of asbestos contaminated soil had been found, excavated and stockpiled. The report needs to provide detailed information on the excavation and stockpiling work that was undertaken in AEC02. This information should include, but not be limited to:

    a) Figure 8 shows the sediment basin excavation at the southern end of the Site and that the stockpile of excavated soil is located immediately to its north. Explain why this excavation work was done and why a sediment basin was located on sloping ground in the SW corner of the Site and cut off from the rest of the Site by the stockpile. Describe how the sediment basin works.

    b) Explain why the sediment basin was required to support demolition work conducted at the Site? The report should include a copy of an engineering plan showing the sediment basin location and design.

    c) Describe the soil conditions that were encountered by the excavation work. What data supports the EGA comment that only non-friable asbestos impacted soil was present at building footprints? What is the risk that friable asbestos was also present?

    d) Describe the laydown mechanism that caused asbestos contaminated soils to be present at AEC02.

    e) When was asbestos contaminated soil at AEC02 first excavated and over what time period did the work occur. Advise whether SafeWork NSW was advised of the need

to undertake this work, and provide a copy of any notification issued to SafeWork NSW.

f) Describe the excavation procedures used to remove and stockpile asbestos contaminated soil. Advise whether the soil excavation work was undertaken in accordance with SafeWork NSW requirements.

g) Provide details on the areas, depth and volume of asbestos contaminated soil excavated from the area.

h) What were the reasons for stockpiling asbestos contaminated soil at the selected location? Describe the stockpile design and the environmental protection measures being used to ensure the stockpile area remains safe.

i) Describe the current condition of the stockpile supported by photos.

j) Figure 8 needs to provide a unique identifier for each stockpile together with the volume of stockpiled material.

k) Provide details of the asbestos fibre air monitoring conducted for this work. Where were monitors located and provide a summary of the monitoring results. Provide copies of air monitoring reports.

l) Describe how asbestos contaminated soil was removed from the excavation and transported to the stockpile areas. Was a common transportation route used or multiple routes? Provide a figure showing the routes used to transport asbestos contaminated soil from building footprints to the stockpile area.

m) Describe the environment procedures used to minimise the risk of asbestos contaminated soil being spilt and contaminating other parts of the Site.

n) Describe the material tracking procedures used and provide copies of material tracking documentation in an appendix.

o) Assess the risk of excavated asbestos contaminated soil contaminating other parts of the Site.

p) Advise whether an occupational hygienist provided asbestos clearance certificates for each building footprint after the soil was excavated. If available, provide copies of these certificates.

q) Based on the extent of asbestos contaminated soil found by the excavation at AEC02, reassess the likely extent of asbestos contaminated soil remaining in the area.

r) Provide copies of field records and photos prepared by environmental consultants / occupational hygienists for this work.

22. Section 11.1.3 AEC05 – Uncharacterised Fill Materials Beneath On-site Structures:

a) Correct the number of test pits actually used to characterise the soils remaining at building footprints after asbestos contaminated soils had been removed. The data in the report indicates that 46 test pits were excavated.

b) Update the reference to the 2021 WA DoH guidelines, since the NSW EPA has accepted most parts of the 2021 version.

c) Provide the GPS coordinates for each AEC05 test pit on the logs.

23. Section 11.2 Site Geology:

a) The report should describe the presence and types of foreign material present in the fill and that the presence of B&D waste increases the risk of asbestos contamination being present.

b) The report should assess and describe the variation in fill thickness across the Site. Identify areas of shallow fill where foreign materials were not identified. Assess the likely risk of asbestos contamination being present in these areas (e.g. southern sporting fields, the two main carparks, main roadway, Conservation Reserve).

c) The report should identify where possible waste burial pits are located, based on borehole and test pit data showing localised areas of much deeper fill. These areas should be shown on the figures.

d) The report advises that "*Refusal / bedrock was not encountered at any test pit prior to reaching termination depth between 0.6 m and 4.0 m bgs*." This is incorrect since test pit logs show that clayey shale was encountered at a number of locations. Refer to the logs for:

- AEC02 TP45;
- AEC03 TP73, TP77, tp79,
- AEC05 TP07, TP08, TP18, TP20

e) The report needs to describe the characteristics of the shale bedrock underlying the natural clay soils. Advise that the shale bedrock is part of the Wianamatta stratigraphic unit where groundwater is naturally saline and unsuitable for beneficial reuse.

24. Section 11.5 Potential Asbestos Containing Materials:

a) Appendix E of the report provide inspection reports for Structure 1 and Building 10. Explain why no site inspection reports are provided for Buildings 4 and 5.

b) The report advises that '*Visual evidence of potential asbestos containing materials (PACM) in the form of fibre cement fragments were observed within test pits advanced across all four (4) areas of environmental concern accessible and assessed as part of this assessment. PACM was limited to the soils within the 0.0 – 0.6 m below ground level."* This is an incorrect statement, since visible asbestos was identified by Alliance / SEG / EGA at:

- Alliance TP59 (ground surface to below 2.2m);
- AEC02 TP22 (to 0.8m), TP35 (1.1 – 1.2m), TP39 (to 0.9m); and
- AEC03 TP28 (to 0.7m), TP68 (0.2 to below 1.4m), TP70 (0.2 to below 1.0m), TP72 (to 1.2m).

Furthermore, the SEG / EGA test pit logs record fill containing foreign materials were not sampled and tested below a depth of 0.6 m.

The report needs to reassess the presence of asbestos below a depth of 0.6 m. A figure showing the known locations of asbestos deeper than 0.6 m would be helpful.

c) Table 11.5.1 needs to include locations identified by SEG / EGA that are missing from the table. These include:

- AEC01 TP14, TP16, TP23;
- AEC02 TP12, TP28, TP42;
- AEC03 TP72 (Note: The table mentions TP71 but the log and the lab results don't identify the presence of asbestos at this location)

d) Table 11.5.1 needs to include locations where asbestos was identified by previous investigations. These include:

- Coffey 2011 DSI: EBH1, EBH2, EBH3, EBH5, EBH24, EBH25
- JBS&G 2018 PSI: SS10
- Alliance 2020 DSI: TP09, BH21, BH39, TP53, TP56, BH59, TP101

25. Section 11.6 Stockpiled Soils:

a) Advise whether any samples have been collected and tested for asbestos from the stockpiled asbestos contaminated soil from the building footprints and AEC02 excavation work. If so, provide the data and assess the results.

b) The report advises that additional sampling of these stockpiles is required. Describe the scope of additional testing required and when this testing needs to be undertaken.

26. Section 14.1.2 Asbestos Contamination Extent within AEC01:

a) Reassess the extent of asbestos contamination at AEC01 by including the asbestos contamination found at AEC01 TP14, AEC01 TP16, and the building footprints shown in Figure 10.

b) Advise whether the available data supports a single continuous area of asbestos contaminated fill at AEC01.

c) Advise whether any vegetation exists in AEC01 that needs to be protected and be accounted for in the shape of the AEC01 excavation.

d) What area size, depth and volume of asbestos contaminated soil needs to be excavated from AEC01 and remediated?

e) Figure 7 shows that friable asbestos was found at 6 sample locations. Explain why the extent of asbestos contamination in Figure 7 that needs to be remediated as non-friable asbestos.

f) Revise the boundaries of AEC01 in Figure 7.

27. Section 14.2.2 Asbestos Contamination Extent within AEC02:

a) Reassess the extent of asbestos contamination at AEC02 by including the asbestos contamination found at AEC02 TP12, TP28, TP35 and TP42, together with the

topographic contours shown on the survey plan. What data requires the irregular shape of AEC02 shown in Figure 8?

b) Explain the rationale used to define the extent of friable asbestos

c) Advise whether any vegetation exists in AEC02 that needs to be protected and be accounted for in the shape of the AEC02 excavation.

d) What area size, depth and volume of asbestos contaminated soil needs to be excavated from AEC02 and remediated?

e) Figure 8 shows that friable asbestos was found at EBH24 and EBH25. Explain why the extent of friable asbestos contamination at each of these locations is a 5 x 5 m square. Why isn't a single zone of friable asbestos contamination defined that includes both these sample locations and extends half way out to the next sample location where bonded asbestos was found?

f) Revise the boundaries of AEC02 in Figure 8.

28. Section 14.3.2 Asbestos Contamination Extent within AEC03:

a) Advise whether any vegetation exists in AEC03 that needs to be protected and be accounted for in the shape of the AEC03 excavation.

b) What area size, depth and volume of asbestos contaminated soil needs to be excavated from AEC03 and remediated?

c) Figure 9 shows three remediation areas separated by a path. Doesn't the data support combining these three areas into one larger area that includes the path? Revise the boundaries of AEC03 in Figure 9.

d) Figure 11 shows that EGA considers further investigations are required in the central part of the Site prior to the commencement of remediation work. Explain the rationale required for this additional investigation work, given the extensive amount of investigation work already undertaken since 2011 across the central part of the Site. If additional investigations are required then describe the nature and scope of these investigations and advise that the areas to be investigated are shown in Figure 11.

29. Section 14.4 AEC05:

a) The report needs to provide a contamination assessment for the 46 fill samples that were collected from the building footprints, presumably after the completion of excavation work, and tested for asbestos, metals, PAH, BTEX, TRH, PCBs, OCPs and OPPs.

b) The available data collected by EGA that the only sample where contamination was measured was at AEC05 TP09 where visible asbestos was found on the ground surface and buried in fill. Define the extent of contamination that remains in AEC05 and needs to be remediated.

c) What area size, depth and volume of contaminated soil that still needs to be excavated from AEC05 and remediated?

d) Figure 10 shows the extent of asbestos remaining at AEC05. The figure shows many building footprints where non-friable asbestos is shown to still remain. Explain in detail why this contamination remains in these footprints given that:

- Asbestos contaminated soils were reported to have been excavated from these footprints and placed in stockpiles around the Site; then
- The soils that remained were investigated and practically no asbestos contamination was found (Note: the one exception was at sample location AEC05 TP09)

e) Provide a table summarising data on the building footprints where soils still need to be remediated or further investigated. Identify each such building with the building number used for the demolition work and include these building numbers in Figure 10.

30. Section 15 Revised Conceptual Site Model:

a) The revised CSM includes AEC05 Building Footprints where the COPCs are metals, PAH, BTEX, TRH, PCBs, OCPs, OPPs, phenols and asbestos. Table 15.1.1 list this AEC as pending assessment. The report needs to complete this assessment.

b) If EGA considers that no additional groundwater investigation, then AEC07 should be removed from Table 15.1.1. On the other hand, if EGA considers that additional groundwater investigations are required, then the report should provide more detail justifying the need for the additional investigation.

c) The revised CSM should include additional AECs associated with:

- The stockpiles containing asbestos contaminated soil from the building footprint excavations. Figure 10 shows these stockpiles spread out across the Site;
- The stockpile containing asbestos contamination soil from the sediment basin excavation work; and
- Abandoned buried services and septic tanks.

d) Figure 11 shows the locations where additional investigations are required. This section of the report should describe the nature and scope of these investigations and show the locations where these investigations need to occur on Figure 11.

31. Section 16 Conclusion and Recommendations:

a) Revise the conclusions based on further assessment work done by EGA in addressing the above review comments.

b) Section 2.3.2 of the Canterbury Bankstown (22 August 2017) "*Contaminated Land Policy" advises that "The detailed site contamination investigation should include a statement which describes whether the site is suitable for the proposed use, or if remediation is necessary to make the site suitable for the proposed use. If remediation is required, the report should also list the feasible remediation options available to remediate the site*." The second objective of the DSI (Section 1.3) also mentions the need for such a conclusion to be made. This section of the report

needs to be amended to meet Council's requirement and to satisfy the objectives of the DSI.

c) Explain why a supplementary contamination assessment is required for AEC05, given that one of the main objectives of the EGA 2025 DSI was to do such an assessment. If EGA can undertake this supplementary assessment as part of the existing report, then remove reference of the need for conducted an additional assessment for AEC05.

d) If EGA reconsider the need for a further groundwater investigation, then remove reference to AEC07.

e) Explain why a waste classification assessment needs to be mentioned as part of the DSI. Can't the need for such work be addressed by the RAP?

f) The report needs to specify the need and parts of the Site where additional investigations are required prior to remediation. Provide a summary table that sets out the nature of the investigations and scope of work.

32. Section 18 References:

a) Update the reference to the NSW EPA (2020) Hazardous Ground Gas Guideline.

b) Update the reference to the WA DoH (2021) asbestos guidelines, since the NSW EPA[3] has accepted most parts of the 2021 version.

33. Figures:

a) Make the scale bar in Figures 1 to 11 visible.

b) Figures 3 to 9 include sample locations that were not investigated. Ensure these figures are corrected.

c) Make corrections to figures as described in the above review comments.

34. Tables:

a) Ensure Table LAR1 is reformatted so that it is legible when printed on A3 size paper.

b) The ALS lab test certificates show that soil samples were only tested for the presence of asbestos to a limit of Reading (LOR) of 0.01%. The lab summary table LAR3 shows that the samples were tested for asbestos concentrations to a LOR of 0.001 %. The LOR needs to be amended to be consistent with the test certificates.

35. Appendix A Test Pit Logs:

a) Include the grid coordinates for each test pit on the test pit logs.

b) A copy of the log for AEC03 TP63 is missing and needs to be provided if field records exist. If a log is provided, also provide me with a copy of the field record.

c) AEC05 TP35 needs to record the presence of asbestos, as indicated in Table 11.5.1.

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[3] https://www.epa.nsw.gov.au/Your-environment/Contaminated-land/other-contamination-issues/managing-asbestos-in-and-on-land

36. Appendix C Laboratory Documentation:

    a) ALS generally issued three types of lab reports for each batch of samples tested. However, the EGA report only provides copies of the "Certificate of Analysis". Appendix C needs to include copies of the other two types of reports issued by ALS, since they provide important QA/QC data.

Should further information need to be provided explaining any of the above review comments, please don't hesitate to contact me. In the interim, please advise me when a complete final copy of the report will be provided so I can complete the Section B SAS / SAR.

Yours sincerely



Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
Director, Ian Swane & Associates
Certified Site Contamination Specialist
Phone: 0418 867 112
Email: iswane@bigpond.com

APPENDIX A

LIST OF REPORTS REVIEWED BY THE SITE AUDITOR

1. Coffey Geotechnics (25 August 2011) '*Phase 2 Environmental Site Assessment, Student Residence Development, University of Western Sydney, Bankstown Campus".* Document No: GEOTLCOV24163AD-AB prepared for The University of Western Sydney
2. Noel Arnold & Associates (October 2011) '*Soil Contamination Investigation, University of Western Sydney – Bankstown Campus, Bullecourt Avenue, Milperra NSW*'. Document SJ0085:95458 prepared for JDH Architects
3. JBS&G (7 February 2018) '*Phase 1 Environmental Assessment Report, Bullecourt Ave, Milperra NSW*'. Document No: 54086-110124 (Rev 1) prepared for the Western Sydney University
4. Alliance Geotechnical Pty Ltd (30 January 2020) '*Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214, Lot 103 DP874035*'. Document No. 9996-ER-1-1 prepared for Mirvac

5. Alliance Geotechnical Pty Ltd (15 September 2022) 'Remedial Action Plan, Western Sydney University – Milperra Campus, Horsely Rd & Bullecourt Ave, Milperra, NSW 2214'. Document No. 9996-ER-2-1_Rev03 prepared for Mirvac
6. Walkden L (27 September 2022) 'Site Audit Report, Remediation Action Plan, Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra'. Audit No: LW-030 prepared for Mirvac
7. Walkden L (27 September 2022) Section B Site Audit Statement for Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra. Audit No: LW-030 prepared for Mirvac
8. Sydney Environmental Group (22 February 2024) '*Supplementary Stage 2 Detailed Site Investigation, Western Sydney University, Milperra Campus, Milperra NSW*'. Document No: 2300-DSI-01-220224.v1f prepared for Mirvac Homes (NSW) Pty Ltd
9. Sydney Environmental Group (27 February 2024) '*Hazardous Building Materials Survey Report, Western Sydney University – Bankstown Campus, Milperra NSW*'. Document 2300-HBMS-071123.v2f prepared for Mirvac Pty Ltd
10. EGA (30 July 2025) '*Demolition Clearance Report – 2 Bullecourt Avenue, Milperra NSW*'. Document No: 2300-LTR-01-160725.v1f prepared for Mirvac
11. EGA (26 August 2025) '*Phase 2 Assessment – Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'. Document No: 2300-DSI-01-110325.v5f prepared for Mirvac Residential (NSW) Developments Pty Ltd

iswane@bigpond.com

From:	iswane@bigpond.com
Sent:	Wednesday, 8 October 2025 3:59 PM
To:	'Nibraas Ahmad'; 'Jerome Guinto'
Cc:	'Arron Tanoai'; 'Shane Gray'; 'Steven Wallace'; 'Max Cunningham'
Subject:	RE: Interim Audit Advice on 2EGA 025 RAP for WSU Milperra (SA316)
Attachments:	SA316_251008_Lower bound cost.pdf

Nibraas / Jerome

As I commence my review of the EGA 2025 RAP, I note that the RAP (Section 5.2) has considered only two remediation options. These are on-site treatment with beneficial reuse, and dispose to landfill. In my opinion, both these options represent high cost options.

Given this, I am interested to know if anyone on the Project Team has prepared a cost estimate for the remediation work that will be needed at the Site. I have done a back of the envelope estimate of off-site disposal costs, with no allowance for any other work that will be required. My lower bound cost exceeds $20 million, with a breakdown attached.

I recognise that on-site treatment with beneficial reuse should be a lower cost option than off-site disposal. But it still will be expensive, given that the beneficial reuse of the soil will need extensive manual processing, inspection, and validation both during treatment and of surface soil after placement (given that the NEPM criteria is ZERO visible asbestos in surface soil). Given the quantities given in the RAP, the lower bound cost is still likely to exceed $10 million.

I remember last year Mirvac advising me that the shared remediation budget for the project was $3 million, with any additional cost to be borne by Mirvac alone. Is this still the case? The reason I raise this issue is to check whether anyone has considered lower cost options compared to on-site treatment and off-site disposal. For example:

- Could off-site disposal be restricted to only contamination that exceeds the commercial / industrial criteria (i.e. friable asbestos at AEC01, heavy metals at AEC01a, and ACM buried services)?
- Could on-site treatment be reserved for non-friable asbestos contaminated soil that exceeds the commercial/industrial criteria?
- Could soils contaminated below the commercial/industrial criteria but above the Residential criteria be placed in non-sensitive burial areas within road corridors? Such an approach would not require an LTEMP and an approval from Council.

I assume that the existing version of the RAP has been reviewed internally by members of the Project Team and that no objections have been raised regarding the choice of the preferred remediation options. Consequently, at this early stage of my review, I request that Mirvac / Beville Williams advise me by return email without delay, whether the two preferred remediation options given in the RAP have been endorsed or whether the Project Team wants to receive recommendations from the Site Auditor on potentially lower cost options, as previously advised in interim audit advice issued early last year.

Many thanks
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor
Ian Swane & Associates (mob: 0418 867 112)

LOWER BOUND OFF-SITE DISPOSAL COST ESTIMATE BASED ON RAP QUANTITIES

Version: 8/10/2025

AEC	Description	Unit	Quantity	Rate	Amount
AEC01	Friable asbestos impacted fill	T	135	$ 600.00	$ 81,000.00
	Non-fraible asbestos impacted fill	T	2,985	$ 500.00	$ 1,492,500.00
AEC01a	Lead, cadmium & zinc impacted fill	T	450	$ 400.00	$ 180,000.00
AEC02	Non-friable asbestos impacted fill - in-situ area	T	9,383	$ 500.00	$ 4,691,250.00
	Non-friable asbestos impacted fill - stockpiled soil	T	7,480	$ 500.00	$ 3,740,000.00
AEC03	Non-friable asbestos impacted fill	T	1,645	$ 500.00	$ 822,500.00
AEC04	Former UST area	To be determined			??
AEC05	Non-friable asbestos impacted fill beneath existing building footprints - in-situ area (14,050 m^2 assessed)	T	15,174	$ 500.00	$ 7,587,000.00
	Non-friable asbestos impacted fill beneath existing building footprints - in-situ area (6,500 m2 unassessed)	To be determined			??
	Non-friable asbestos impacted fill beneath existing building footprints - stockpiled soil	T	4,071	$ 500.00	$ 2,035,500.00
AEC06	LFG migration from Council putrescible landfill south of Site	Investigation cost only as remediation unlikely			$ 30,000.00
AEC07	Groundwater contamination migrating into northern and eastern parts of Site	Low risk of further work required			$ -
AEC08	Buried services and septic tanks	To be determined			??
AEC09	Remediation of presently unknown asbestos contaminated fill	To be determined			??
AEC10	Clearance of surface soil of visible asbestos following completion of bulk earthworks	To be determined			??
		TOTAL			**$ 20,659,750.00**

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Mirvac Homes (NSW) Pty Ltd
Level 28, 200 George Street
SYDNEY NSW 2000

Attention: Mr Nibraas Ahmad – Development Manager

9 October 2025

SA316_251009_IAA06
SA316

Dear Sir

INTERIM AUDIT ADVICE ON EGA DEMOLITION CLEARANCE REPORT, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (8 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd (**Mirvac**), Beveridge Williams (**BW**) and the environmental consultant EGA with interim audit advice as part of statutory Site Audit No. 316 being undertaken by Dr Ian Swane, a NSW Environment Protection Authority (**EPA**) Site Auditor accredited under the Contaminated Land Management Act 1997 (**CLM Act**). The land the subject of this site audit (i.e. the **Site**) was formerly the Western Sydney University (**WSU**) Milperra Campus located at 2 and 2a Bullecourt Road, Milperra, legally defined as Lot 2 DP1291984 and Lot 1 DP101147. The Site covers an area of 19.64 ha.

The purpose of this letter is to provide the Site Auditor's review comments on a Demolition Clearance Report prepared by the environmental consultant EGA dated 30 July 2025.

This interim audit advice is considered to be consistent with EPA guidelines and policy and does not pre-empt conclusions to be drawn at the end of the site audit process. This interim audit advice does not represent a site audit statement (**SAS**) or site audit report (**SAR**) that are intended to be prepared at various stages throughout the audit period as development stages are completed.

2. Site Auditor Review Comments

The Site Auditor has identified matters that need to be addressed by EGA in a revised report. The revised report needs to be dated using the date when it is issued.

The matters that need to be addressed are:

1. Section 1.1 Overview:
    a) The third dot point needs to be corrected because the SEG HAZMAT was dated 27/02/24 and identified, in addition to asbestos and lead containing building materials, possible PCBs in fluorescent light fittings, synthetic mineral fibres, and possibly ozone depleting substance in air conditioning units.
    b) Condition 1.7 of the Demolition Consent refers to a SEG HAZMAT report dated 8/11/23. I assume that the 27/02/24 version supersedes the earlier one referenced in the Consent. The report needs to explain why a later version of the HAZMAT was

prepared and what changes were made. The report should advise that the 27/02/24 HAZMAT includes all recommendations made by the earlier version, since the recommendations made in the earlier version are referred to in the Consent.

c) The report should advise whether all structures within Zones 1 to 4 have been demolished, as allowed by the Consent.

d) Condition 1.3 of the Consent did not approve any demolition work in Zone 5. The report should confirm that compliance with this condition was met.

e) Advise that the report was prepared by an appropriately qualified occupational hygienist and meets the requirements of Condition 1.7 of the Consent.

2. Section 1.3 Objectives:

a) The report needs to include the following additional objectives in order that the report meets NSW regulatory requirements. These additional objectives are:

- To verify that the demolition areas are free from hazardous building materials like asbestos, which is crucial for the safety of workers engaged in future remediation and civil works at the Site;
- To provide documentation to Council demonstrating that the demolition work was completed according to regulations;
- To certify that the land is stable and ready for subsequent remediation, excavation, construction, or other development activities; and
- To confirm there is no negative impact on the surrounding area for the completed demo0lition work, thereby preventing potential environmental risks.

3. New Section 1.5 Asbestos Clearance Methodology:

a) Provide a detailed description of the procedures used by SEG / EGA when conducted asbestos clearance inspections at the Site.

b) Advise that a licensed or competent independent person meeting SafeWork NSW requirements conducted each visual inspection.

4. Section 2.1 Hazardous Building Materials:

a) The SEG HAZMAT identified hazardous building materials in addition to asbestos, these being lead containing paint, suspected PCBs in fluorescent light fittings, and ozone depleting substances in air conditioning units. The report needs to include any additional inspection reports that dealt with these additional hazardous building substances.

b) The report needs to describe how asbestos in buildings was managed and disposed. Was known asbestos removed from buildings prior to the commencement of demolition work? Was unknown asbestos removed from buildings prior to any further demolition work occurring on the building?

c) The report needs to describe how these materials were managed and disposed as part of the demolition work. Were they removed from buildings prior to the commencement of demolition work?

d) The report needs to explain why no HAZMAT assessment was performed for building 13 prior to commencing demolition.

5. Section 3 Unexpected Finds:

   a) Rename this section "*New Finds of Hazardous Building Materials*", since the presence of additional asbestos contamination in buildings was not unexpected but expected and a function of not being previously identified due to accessibility constraints.

   b) Delete the heading for Section 3.1 since it is not needed because there is only one section in Section 3.

   c) Table 3.1 needs to include the following additional new finds that were made during demolition work:

      - Building 1 ACM buried pipe;
      - Building 5 external wall cladding;
      - Building 9 Ground floor RHS corridor – safe (assumed friable);
      - Building 11 ACM formwork under concrete footpath;

6. Section 4.1 Structure 1, Exterior, Presumed Asbestos Fibre Cement Panelling – SE 2023:

   a) The third paragraph needs to be relocated to Section 4.5 since the Work Science 11 November 2024 concerns Building 5 not Building 1.

   b) The removal of asbestos wall lining in the Building 1 elevator shaft is documented in the SEG (15/01/25) clearance report.

7. Section 4.3 Structure 1 – Unexpected Finds:

   a) Rename this section "Structure 1 - *New Finds*", since the presence of additional asbestos contamination in buildings was not unexpected but expected and a function of not being previously identified due to accessibility constraints.

   b) The SEG (12/03/25) clearance report advises that the asbestos contaminated blackjack was removed from the Site between 4/03/25 to 10/03/25. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos contaminated blackjack was disposed between 8/03/25 and 10/03/25. Provide copies of any missing tip dockets in Appendix C.

8. New Section 4.3.7 ACM Buried Pipe: The SEG (21/03/25) inspection report for Building 1 identified the presence of an asbestos pipe at the ground surface. Describe the actions taken to remove / make safe this pipe. If the pipe remains, provide a drawing showing its location.

9. Section 4.4.1 Structure 14B Fibre Cement Fragments Bonded to Concrete Footpath Slab:

   a) The asbestos fragments are described as having been bonded to the underside of the concrete footpath slabs. Provide more details on how these asbestos fragments were removed by hand from the concrete surface.

b) Explain why the parts of the concrete slab where asbestos fragments were attached were recycled. The POEO Act requires materials that contained asbestos to still be classified as asbestos waste even after the asbestos has been removed.

c) Explain why samples of concrete were not lab tested to demonstrate that no asbestos remained on the concrete?

d) Where was the concrete disposed?

10. Section 4.5.1 Structure 5 Fibre Cement Sheeting and Fragments: The EGA (13/05/25) clearance report advises that the ACM fragments were removed from across the building footprint between 1/05/25 and 6/05/25. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed. Provide copies of any missing tip dockets in Appendix C.

11. New Section 4.5.2 External Wall Cladding: Describe the removal of the asbestos wall cladding documented in the Work Science (11/11/24) clearance report.

12. Section 4.6.1 Structure 10 Asbestos Fibre Cement Packers:

    a) The third paragraph of the report advises that asbestos removal work occurred between 1 and 4 March 2025. How can that be given that EGA inspected and collected samples of the ACM packers on 1 May 2025. Also, the EGA (17/0-6/25) clearance report provides no information on when the demolition contractor removed the asbestos. Given that the EGA asbestos clearance report is dated 17/06/25, isn't it likely that the asbestos contamination was removed from the Building 10 area only a few days before the report was issued?

    b) Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed. Provide copies of any missing tip dockets in Appendix C.

    c) The fourth paragraph of the report advises that EGA completed a visual clearance inspection on 4 March 2025. How can this be, since the EPA (6/05/25) inspection report advises that EGA inspected and collected samples of the ACM packers on 1 May 2025. The EGA (17/06/25) clearance report provides no indication of when EGA conducted the asbestos clearance inspection. The report needs to provide additional documentation that demonstrates that an LAA actually conducted an asbestos clearance inspection for ACM packers.

13. Section 4.6.2 Structure 10 Asbestos Fibre Cement Fragments:

    a) Paragraph 3 of the report advises that asbestos removal work was undertaken on 3 June 2025. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed. Provide copies of any missing tip dockets in Appendix C.

14. Section 4.7.1 Structure 11 Fibre Cement Roof Undercloaking:

    a) The third paragraph of the report advises that the asbestos was removed from the Site on 15/05/25. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed. Provide copies of any missing tip dockets in Appendix C.

15. Section 4.7.2 Structure 11 Fibre Cement Eaves:

    a) The fifth paragraph of the report advises that the asbestos was removed from the Site on 20/05/25. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed between 8/03/25 and 10/03/25. Provide copies of any missing tip dockets in Appendix C.

16. Section 4.7.3 Structure 11 Asbestos Fibre Cement Sheeting:

    a) The third paragraph of the report advises that the asbestos was removed from the Site on 4/06/25. Given that the latest tip docket provided in Appendix C of the report is dated 7/03/25, advise where the asbestos was disposed. Provide copies of any missing tip dockets in Appendix C.

17. New Section 4.8 Structure 9: The Work Science (19/09/24) inspection report advised that a safe was found that could contain friable asbestos. The report needs to advise what happened to the safe.

18. Section 4.9 Waste Disposal:

    a) Sections 1.1 and 4 of the report advise that hazardous building materials were removed as part of the demolition work between October 2024 to July 2025. However, the last tip docket provided in the report is dated 7/03/25. The report needs to provide all tip dockets for hazardous building materials removed from the Site.

    b) The report should advise whether all demolition waste removed from the Site was managed in accordance with the POEO (Waste) Regulation 2014, which was a requirement of Condition 3.13 of the Consent. If non-compliances or data gaps occurred, then the report should identify them and assess their significance.

    c) The report provided no Waste Classification Reports (**WCRs**). I assume this is because the waste was pre-classified under Step 3 of the EPA waste guidelines. The report advise whether this was the case.

    d) The report should assess whether all demolition waste removed from the Site was transported by a contractor licensed to transport the waste, that there were no reports of waste being spilled and all loads were covered prior to the trucks leaving the Site, as required by Condition 3.13 of the Consent. If non-compliances or data gaps occurred, then the report should identify them and assess their significance.

    e) The report needs to advise whether all waste generated by the demolition work was removed from the Site. If not, then describe what waste remains at the Site.

    f) The report should assess whether all demolition waste removed from the Site was disposed at appropriate waste facilities, as required by Condition 3.13 of the Consent. If non-compliances or data gaps occurred, then the report should identify them and assess their significance.

19. Section 5 Structure Footprints:

    a) Rename this section "*Stripping of Surface Soil from Demolition Zones*" since this is a more accurate description of what was done.

b) The report advises that after the demolition work had been completed, an inspection of the ground surface was undertaken by an occupational hygienist from EGA across the four demolition zones numbered 1 to 4, which included both building footprints and the areas outside building footprints. The occupational hygienist reported that no visible asbestos was found. Explain the objective of these inspections given that all visible asbestos encountered by the demolition work had already been removed.

c) The report advises that after inspections within each zone were completed, the surface soil was stripped and large quantities of soil were stockpiled on-site. Explain why this work was undertaken as part of the demolition work.

d) The Demolition Consent did not approve the stripping of surface soil from across large areas of the Site, particularly if no visible asbestos was found and the work was not required to make the Site safe for demolition work. Under what Development Consent or approval was this work undertaken, or did the work constitute unauthorised work.

e) Explain why the Site Auditor was not informed of the proposal to undertake the soil stripping work.

20. Section 5.1 Demolition Zones 1 & 4 – Site Inspection:

a) The report advises that a site inspection of Zones 1 and 4 was undertaken on 7 July 2025 by Tahlia Jeoffreys, a suitably experienced occupational hygienist. Provide details on the qualification and experience that makes the EGA consultant s suitably experienced occupational hygienist.

b) Provide the area of Zones 1 and 4.

c) How many hours did the inspection of Zones 1 and 4 take? Provide copies of field records to support the duration taken.

d) Describe the ground conditions that existed at the time of the inspection. Was any vegetation present or other types of ground cover that obscured the examination of surface soil?

e) Provide detailed procedures used by EGA during the inspection. Was it a comprehensive assessment based on a grid-based walkover? Did the inspection cover the entire area? What was the lane width used? Was the inspection conducted in perpendicular directions? Was any raking of the ground surface used? What materials were found on the ground surface during the inspection?

21. Section 5.1 Demolition Zones 1 & 4 – Soil Stripping and Stockpiling:

a) What was the depth of soil that was stripped from across Zones 1 & 4?

b) Describe the soil stripping procedures used.

c) Describe the environmental protection measures used during the soil stripping and stockpiling work.

d) Describe how the stripped soil was moved and placed into stockpiles.

e) Where and how was the soil stockpiled? Is there geofabric under the stockpile base and is the stockpile covered? What type of geofabric was used and how is the cover secured against strong wides?

f) What was the design of the stockpile?

g) What volume of soil was generated and placed in each stockpile? How are the stockpiles identified?

h) Describe the current condition of each stockpile supported by photos.

i) Describe the environment procedures used to minimise the risk of asbestos contaminated soil being spilt and contaminating other parts of the Site.

j) Describe the material tracking procedures used and provide copies of material tracking documentation in an appendix.

k) Provide a figure showing the routes used to transport asbestos contaminated soil from building footprints to the stockpile area.

22. Section 5.1 Demolition Zones 1 & 4 – Contamination Assessment of Stockpiled Soil:

a) Provide a contamination assessment of the stockpiled soil stripped from Zones 1 and 4.

b) The soil that was stripped from across Zones 1 & 4 came from building footprints where no visible asbestos had been identified, from AECs identified by the DSI where asbestos contaminated fill had been identified, and from other areas outside building footprints where no asbestos contamination had been found. This means that the stripping of soils from across Zones 1 and 4 has caused uncontaminated soil to be cross-contaminated and a much large quantity of soil will need to be remediated and/or validated. Assess the cross-contamination of soils stripped from Zones 1 and 4.

c) Assess whether the stripping or soils from across Zones 1 and 4 has increased the risk of areas that were previously uncontaminated to become contaminated with asbestos.

23. Section 5.2 Demolition Zone 2: Address the same matters for Zone 2 as detailed in paragraphs 20 - 22

24. Section 5.3 Demolition Zone 3: Address the same matters for Zone 3 as detailed in paragraphs 20 - 22

25. Section 6 Conclusions: Adjust the conclusions in light of new information addressing the above review comments.

IAN SWANE & ASSOCIATES P/L

Given the significant changes that have occurred to the Site since I last inspected it on 6 February 2025, please advise me when I can conduct a site inspection. I will need to inspect the site prior to issuing the Section B SAS / SAR.

Should further information need to be provided explaining any of the above review comments, please don't hesitate to contact me. In the interim, please advise me when a complete final copy of the report will be provided so I can complete the Section B SAS / SAR.

Yours sincerely



Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
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Mirvac Homes (NSW) Pty Ltd
Level 28, 200 George Street
SYDNEY NSW 2000

Attention: Mr Nibraas Ahmad – Development Manager

15 October 2025

SA316_251015_IAA07
SA316

Dear Sir

INTERIM AUDIT ADVICE ON EGA 2025 RAP, REDEVELOPMENT OF WESTERN SYDNEY UNIVERSITY MILPERRA CAMPUS FOR RESIDENTIAL SUBDIVISION (35 pages)

1. Purpose

This letter provides Mirvac Homes (NSW) Pty Ltd (**Mirvac**), Beveridge Williams (**BW**) and the environmental consultant EGA with interim audit advice as part of statutory Site Audit No. 316 being undertaken by Dr Ian Swane, a NSW Environment Protection Authority (**EPA**) Site Auditor accredited under the Contaminated Land Management Act 1997 (**CLM Act**). The land the subject of this site audit (i.e. the **Site**) was formerly the Western Sydney University (**WSU**) Milperra Campus located at 2 and 2a Bullecourt Road, Milperra, legally defined as Lot 2 DP1291984 and Lot 1 DP101147. The Site covers an area of 19.64 ha.

The purpose of this letter is to provide the Site Auditor's review comments on a Remedial Action Plan (**RAP**) prepared by the environmental consultant EGA dated 11 September 2025 titled "*Remedial Action Plan, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW*".

This interim audit advice is considered to be consistent with EPA guidelines and policy and does not pre-empt conclusions to be drawn at the end of the site audit process. This interim audit advice does not represent a site audit statement (**SAS**) or site audit report (**SAR**) that are intended to be prepared at various stages throughout the audit period as Development Stages are completed.

2. Site Auditor Overview of EGA RAP

The Site Auditor considers that the current version of the RAP is poorly written and does not meet EPA guidance, as outlined in Section 1.5 of the EPA (2020) Reporting Guideline. This is because the RAP does not:

- Address all the remediation objectives set by NSW EPA guidance
- Clearly and logically summarise the findings of the site investigations and provide a robust contamination assessments;
- Define the extent of remediation required across the site;
- Assess all practical and feasible options and remedial technologies to achieve the remediation objectives;

- Does not assess the practicality and feasibility of the preferred remediation strategy adopted;
- The preferred approach does not consider the principles of ecologically sustainable development
- Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use
- Properly address contingencies and unexpected finds protocols
- Identify all necessary approvals and licences required by regulatory authorities including any items likely to be contained in development consent conditions
- Important omissions in validation methodology;
- Extensive errors in the text and figures; and
- Inclusion of a lot of unnecessary documentation.

In my opinion, the main reason for the deficiencies in the RAP is a lack of review by senior personnel experienced in the type and scale of remediation work required at the Site. In particular, the RAP does not provide a clearly defined strategy that deals with important issues and which can be readily implemented by a principal contractor responsible for remediation , earthworks and other civil works at the Site. The lack of a clearly defined scope of work and methodology increases the risk of significant cost overruns and delays to the development project.

Also, there is an important need for Mirvac and BW to critically review the RAP to ensure that it best meets the requirements of the proposed development and to facilitate tendering, contractor selection, and execution of the remediation / bulk earthworks / civil work.

The review comments provide below seek to identify these shortcomings and provide advice on how they can be addressed. The review comments need to be addressed by EGA providing a revised RAP for review by the Site Auditor in order that a Section B SAS / SAR can be finalised and issued.

3. Site Auditor Review Comments

The Site Auditor has identified matters that need to be addressed by EGA in a revised report. These matters are:

1. **Title Page & Document Record**: The date of the report needs to be changed to correspond to the date the revised RAP is actually completed and issued, together with an updated revision number.
2. **Executive Summary**: Update this section in light of revisions made in the main body of the RAP.
3. **General**: Update the RAP to address Site Auditor review comments provided in interim audit advices 25/09/25 (for the EGA DSI) and on 9/10/25 (for the EGA Demolition Clearance Report).

4. **Section 1.1 Background**:

   a) The RAP needs to explain the EGA report supersedes and replaces an earlier remediation RAP for the Site prepared by Alliance Geotechnical dated 15 September 2022. Explain why the EGA RAP supersedes the one prepared by Alliance Geotechnical. Possible reasons may include, but not be limited to:

   - Additional, much larger site contamination investigations have been undertaken since the Alliance Geotechnical RAP was issued in 2022;
   - These additional investigation have identified more extensive asbestos contamination at the Site;
   - Practically all buildings at the Site have been demolished and more asbestos contamination found; and
   - Surface soils across large parts of the Site have been stripped and stockpiled, which are considered to be contaminated with asbestos.

   b) Remove reference to Figure 2 since the boundaries of the area needing to be remediated and/or validated correspond to the site boundaries. Also the AECs given in Figure 2 are not valid for the reasons given later in this review.

   c) Correct errors in the existing dot points. These include:

   - Remove dot point 7 since neither EGA or the Site Auditor has a copy of the EIS (2016) report, and the report has been superseded by much more extensive ESAs;
   - Reference to the SEG (22 February 2024) DSI needs to be included due to the large amount of data provided that was subsequently considered by the EGA (2024) DSI report;
   - Reference to the SEG (27 February 2024) HAZMAT needs to be included;
   - Reference to the EGA 2025 Demolition Clearance Report needs to be included since it provides important information on asbestos contamination found in and under buildings, the off-site disposal of ACM, the stripping of surface soils from large areas of the Site that had the potential to be asbestos contaminated, and the on-site stockpiling of these soils;
   - Remove dot point 13 and 14 since this work is covered by reference to the Demolition Clearance Report and the data reviewed by the Site Auditor to-date indicates that the stripping of surface soil from large areas of the Site may have actually increased the amount of contaminated soil needing to be remediated.

5. **Section 1.2 Proposed Development**: This section needs to include the following additional information:

   a) Provide more details on the proposed residential subdivision (e.g. number of housing lots, roadways / footpaths, conservation areas, park land). Provide a copy of the final surface level contour plan for the proposed development.

   b) Provide data on the future ownership of the Site. Will all the housing lots be privately owned under Torrens Titles? Who will own the roadways, conservation areas, park land?

c) A description of the proposed staging of the development, with a copy of the BW (24 July 2025) Master Staging Plan provided. How many housing lots in each stage? What stages have conservation areas / park land been included? Provide a likely timeframe required for each stage.

d) Explain what are the implications of the proposed land ownership and staging of the development work on the remediation of contamination at the Site. For example, will contamination at the Site be fully remediated prior to the commencement of bulk earthworks / civil work? Will individual stages of the residential development be fully remediated prior to the commencement of bulk earthworks /civil work in each stage? Will remediation work within a stage be occurred at the same time as bulk earthworks / civil work? Will the remediation criteria be determined on the basis of the proposed land use in an area or will the same remediation criteria be used across the whole Site ?

e) Provide data on the proposed earthworks plan for the development work. What are the estimated cut to fill volumes? What and where will the largest cuts be located? What and where will the largest fill areas be located? Support this information with copies of cut-to-fill contours plans for the Site. What are the cut-to-fill volumes required for each stage?

f) Advise whether the final site levels for the proposed development are based on achieving a balanced cut-to-fill, or whether fill will need to be removed or imported. I note that Section 5.4 advises that importation of fill will occur. Is this correct?

6. **<u>Section 1.3 Objectives</u>:**

a) Additional objectives need to be included that correspond to those given in EPA guidance[1] and Council's (2017) Contaminated Land Policy:

- Summarise the findings of site contamination investigation reports and present a refined conceptual site model
- Document the identified contamination risks to human health and/or the environment
- Define the extent of remediation required across the site
- Assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of the principles of ecologically sustainable development
- Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use
- Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour and aesthetics)
- Address contingencies and unexpected finds protocols

[1] Section 1.5, NSW EPA (2020) Reporting Guideline

- Identify the necessary approvals and licences required by regulatory authorities including any items contained in development consent conditions
- Clearly outline waste classification, handling and tracking requirements in accordance with the Guidelines for the NSW Site Auditor Scheme and Waste Classification Guidelines (EPA 2014)
- Ensure remediation is consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the remedial action plan
- Identify how successful implementation of the remedial action plan will be demonstrated
- Provide a management framework that will give Council confidence that the remedial measures will be undertaken in accordance with the RAP, to make the site suitable for the proposed use[2].

b) This section should advise that the remediation strategy documented in the RAP has been designed NOT require any long-term management and/or monitoring of contamination following the completion of remediation. This approach was adopted to reflect the requirements of Mirvac and Council.

7. **New Section 1.5 Compliance with Council's Contaminated Land Policy:**

a) Advise that the new RAP meets all relevant requirements specified in the Canterbury Bankstown (22 August 2017) "Contaminated Land Policy"

b) Provide a table summarising the relevant requirements specified in Council's Contaminated Land Policy and identify the section in the RAP where the issue is addressed.

8. **New Section 1.6 Roles and Responsibilities:**

a) This is an important section and needs to be included in Section 1 of the RAP.

b) Move Section 10.3.13 of the existing RAP into this new section but remove refence to the earlier AG RAP since it is unnecessary.

c) The following changes should be made to the existing Table 10.2:

- The Property Owner or Site Developer needs to be primarily responsible for ensuring appropriate personnel are appointed to manage and conduct the remediation and validation works.
- The Project Manager needs to be primarily responsible for overseeing the implementation of this RAP.
- Delete the requirement for the Project Manager concerning "*Site Preparation including establishment of …"* since this should be covered by the Remediation Contractor's responsibilities.

[2] Section 2.3.3, Council (2017) "Contaminated Land Policy"

- The Remediation Contractor needs to primarily be responsible for conducting the remediation works and managing the site in accordance with the requirements of the RAP and associated Development Consent. The Remediation Contractor should also be responsible for preparing a list of contacts, including emergency contacts for the site operations and provision of signage at the site to allow the public to contact nominated site personnel out of hours.
- Delete the requirement for the Remediation Contractor to:
  - "*Development of the remediation objectives and strategy*", since this requirement should be addressed by the RAP; and
  - "Supporting all other members of the Remediation Works Team in …." Since I don't know what this means or entails.
- The Environmental Consultant / Occupational Hygienist needs to be primarily responsible for asbestos issues including air monitoring and providing advice as required by the remediation works and undertaking the validation works in accordance with this RAP. The Environmental Consultant / Occupational Hygienist should also be responsible for inspecting the site and collecting all necessary validation data that will allow them to conclude that:
  - The remediation and validation work has been undertaken in accordance with the RAP and regulatory requirements; and
  - The land associated with each Development Stage is suitable for the proposed land uses without the need for any long-term management.
- Remove reference to the Local Government Authority

9. **<u>Section 4 Previous Contamination Assessments</u>:**

   a) This section needs to be renamed "Site Characterisation Pre-Demolition", as required by NSW EPA guidance[3].

   b) Delete the existing contents of Section 4 as it is meaningless and provides no useful discussion of the characterisation of contamination at the Site. Replace Section 4 with a site characterisation assessment divided into the following sub-sections.

   c) **Section 4.1 Potential Sources of Contamination and Contaminants of Potential Concern**: Describe the potential sources of contamination at the Site and the Contaminants of Potential Concern (COPCs) based on an assessment of historical and site condition data (pre-demolition work in 2024). In my opinion, these potential sources are:

      - Contaminated fill outside building footprints;
      - Contaminated fill across former building footprints;
      - A former UST area in the western part of Site;

[3] Table 2.5, NSW EPA (2020) Reporting Guidelines

- Buried services and possible abandoned septic tanks;
- LFG migrating from Kelso Landfill; and
- Groundwater migrating onto Site.

d) **Section 4.2 Contaminated Fill Outside Building Footprints**:

- Provide a summary of the data quality assessment for investigation data on contamination in fill outside building footprints prior to the demolition work that commenced in 2024.
- Provide a summary of the contamination assessment for these soils and areas;
- Identify the areas where asbestos contamination was found and provide a figure showing the location of these AECs. Determine the plan area, thickness and volume of contamination present at each AEC; and
- Identify any areas where insufficient investigation was undertaken and where data gaps remain. Assess the significance of these data gaps and whether further investigation is needed as part of the remediation strategy documented in this RAP. Specify the scope of work required by any additional investigation.

e) **Section 4.3 Contaminated Fill across Former Building Footprints**: Advise that data on contaminated fill across former building footprints could not be obtained prior to the buildings being demolished, which occurred between 2024 and 2025. Advise that data on this contamination was documented by EGA in the Demolition Clearance Report, with a summary provided in a new Section 5.

f) **Section 4.4 Former UST Area**: Provide information on the USTs that were present in the western part of the Site, when they were removed, and the absence of validation data. Describe the validation data and scope of work that needs to be collected as part of the remediation strategy documented in this RAP.

g) **Section 4.5 Buried Services and Possible Abandoned Septic Tanks**:

i. Advise that the Site had a history of rural – residential land use up to the 1970s. Consequently, there is a risk that abandoned septic tanks may remain at the Site that could contain contaminated waste. Advise that the presence and condition of abandoned septic tanks or other unknown buried structure cannot be determined from discrete investigative methods, so that there presence will need to be identified as part of the remediation strategy documented in this RAP.

ii. Advise that an extensive network of buried services are present at the Site that will need to be removed due to aesthetic and health concerns if constructed from ACM. Advise that a detailed review of historic service plans of the former WSU campus should be undertaken as part of the remediation strategy documented in this RAP. However, the presence and condition of all buried services will need to be identified as part of the remediation strategy documented in this RAP.

h) **Section 4.6 LFG migrating from Kelso Landfill**: Review the available historical data and provide an assessment of the contamination risks that Council's Kelso Landfill poses to the southern part of the Site. Advise that past investigations have

not assessed this risk. Consequently, further investigation is needed as part of the remediation strategy documented in this RAP. Specify the scope of work required by the additional investigation.

i) **Section 4.7 Groundwater Migrating onto Site**: Advise that industrial properties are located to the east and north of the Site, with groundwater from these properties migrating onto the Site. Summarise the groundwater investigations that have been done and assess the risk of contaminated groundwater migrating onto the Site (Note: In my opinion, the available data indicate there is a low risk and no further investigation is required).

10. **New Section 5 Site Contamination Post-Demolition**: Provide a new section that provides a summary contamination assessment for the Site after the completion of demolition work in mid-2025, based on information provided in the EGA Demolition Clearance Report. The assessment should be divided into the following sections.
11. **New Section 5.1 Overview:** Describe the scope of demolition work permitted by Development Consent DA-1512/2023 issued by Council. Provide an overview of the buildings that were present at the Site and were demolished. Describe the information provided in the EGA Demolition Clearance Report, and whether EGA considers the demolition work complied with the consent conditions. Provide a copy of the plan showing the five demolition zones.
12. **New Section 5.2 Extent of Hazardous Building Materials**: Provide a summary of the types and extent of hazardous building materials found by the HAZMATS complete prior to the demolition work and then by the demolition work. Provide details on the hazardous buildings materials and demolition waste removed from Site. Advise whether all demolition waste, including all hazardous building materials, were removed from Site. If any demolition waste remains on-site, provide details. Specify the time period this work occurred and the waste quantities removed.
13. **New Section 5.3 Asbestos Clearance Work:**
    a) Identify the building footprints where no evidence of asbestos contamination was found. Provide a description of the condition of the ground surface at these building locations.
    b) Identify the building footprints where visible asbestos was found and where asbestos clearance reports were issued. Provide a summary description of the asbestos clearance work undertaken at building footprints and the final condition of the ground surface.
    c) Identify building footprints were there remained a risk of asbestos contaminated fill being present.
14. **New Section 5.4 Investigation of Former Building Footprints:**
    a) Provide a summary of the procedures used by EGA to investigate the condition of fill across building footprints following the completion of demolition and asbestos clearance work.

b) Provide a summary of the data quality assessment for investigation data collected on contamination in fill across former building footprints following the completion of demolition and site clearance work.

c) Provide a summary of the contamination assessment for these soils and areas.

d) Identify the areas where asbestos contamination was found to remain within former building footprints and provide a figure showing the location of these AECs. Determine the plan area, thickness and volume of contamination present at each AEC.

e) Identify any areas where insufficient investigation was undertaken and where data gaps remain. Assess the significance of these data gaps and whether further investigation is needed as part of the remediation strategy documented in this RAP. Specify the scope of work required by any additional investigation.

15. **New Section 5.5 Buried Services**:

a) Describe the buried services that were found by the demolition work, where they were located, and whether they were removed or remain on-site.

b) Provide a description of the likely type and extent of buried services that may need to be remediated at the Site. Provide a lower bound estimate of the quantities of buried services that may need to be removed and areas remediated.

16. **New Section 5.6 Site Inspections Across Demolition Zones**:

a) Describe the inspection of the ground surface undertaken by the occupational hygienist from EGA across the demolition zones, which included both building footprints and the areas outside building footprints. Describe the procedures used.

b) The occupational hygienist reported that no visible asbestos was found. Explain the objective of these inspections given that all visible asbestos encountered by the demolition work had already been removed.

c) What materials were found on the ground surface during the inspection?

d) Explain why surface soil was stripped and large quantities of soil were stockpiled on-site. Explain why this work was undertaken as part of the demolition work.

e) For each demolition zone, describe the ground conditions that existed at the time of the inspection.

17. **New Section 5.7 Stripping of Surface Soil from Demolition Zones and Stockpiling**:

a) Describe the procedures used to strip the soil, move it and place the soil into stockpiles. Where and how was the soil stockpiled? Is there geofabric under the stockpile base and is the stockpile covered? What type of geofabric was used and how is the cover secured against strong wides?

b) What was the depth of soil stripped from each Demolition Zone? What volume of soil was generated and placed in each stockpile? How are the stockpiles identified?

c) Assess the risk that the soil stripping operation contaminated shallow soil at the Site in areas where past investigations found no evidence of contaminated fill.

d) Describe the environmental protection measures used during the soil stripping and stockpiling work.

e) Describe the environment procedures used to minimise the risk of asbestos contaminated soil being spilt and contaminating other parts of the Site.

f) Assess the geotechnical suitability of the stripped soil for reuse at the Site. Does the stockpiled material contain vegetation, topsoil and/or demolition waste that makes the stockpiled soil geotechnically unsuitable for reuse at the Site. If the material is considered geotechnically unsuitable for reuse at the Site, does this mean the stockpiled soil will need to be classified as waste and disposed off-site?

g) Assess the risk that the stripped soil is contaminated by asbestos and needs to be classified as asbestos waste. Is there any benefit to be gained from the on-site treatment of the stockpiled soil?

18. **Section 5 Conceptual Site Model**: Rename this section "Refined Conceptual Site Model, as recommended by EPA guidance[4]. Correct the numbering of this section.

19. **Section 5.1 Areas of Environmental Concern and Contaminants of Concern:**

a) This section should be reserved for known AECs that are known as needing to be remediated. Rename this section "*AECs to be Remediated & Their COPCs*".

b) Reassess the AECs present at the Site, based on the assessments provided in Sections 4 and 5, and update the AECs listed in Table 5.1 and Figure 2. Label AEC01 – friable on the figure due to its small size and difficulty in locating the colour code on the figure.

c) The section should mention that the location and extent of all AECs needing to be remediated are shown in Figure 2.

d) The section should mention that close-up views of the location and extent of AEC01-friable and AEC01 – non-friable are shown in Figure 3.

e) The colour codes for AEC01-friable and AEC01 – non-friable shown in Figure 3 should match the colour code used in Figure 2.

f) Figure 2 shows AEC01a where heavy metal impacted soil was found by an early investigation prior to the construction of the childcare centre. In my opinion, the continued presence of heavy metal contamination in this area is uncertain since it was possible the contamination was removed prior to the construction of the childcare centre. I suggest this area be moved into the next section titled "*Potential Areas of Concern*".

g) Figure 2 shows AEC04 where USTs were removed. However, the investigations provide no data showing that contamination remains in this area needing to be remediated. I suggest this area be moved into the next section titled "*Potential Areas of Concern*".

h) Figure 2 shows AEC05 where non-friable ACM remains under across some former building footprints. EGA needs to explain why this AEC exists given the results of

[4] Section 1.5 dot point 1, NSW EPA (2020) Reporting Guideline

the EGA 2025 DSI and the Demolition Clearance Report. If EGA considers that known asbestos contamination remains in these areas, then the data needs to be provided. However, if EGA considers there is a risk of asbestos contaminated fill remaining in these areas, then I suggest this area be moved into the next section titled "*Potential Areas of Concern*" and explain why further investigation is required.

i) Figure 2 shows (in white highlighting) many areas at the Site where the presence of contamination in unknown and where further investigation is required. These areas should be moved into the next section titled "*Potential Areas of Concern*".

j) For each AEC where remediation is required, a table needs to be provided summarising the area, depth and in-situ volume of contaminated soil that needs to be remediated.

k) Revise Figures 2 – 6 to address the issues raised by the Site Auditor.

l) Section 5.1 lists the contamination pathways and potential receptors associated with the AECs. The identification of these pathways and receptors are not relevant to the purpose of Section 5.1, which is to describe the AECs and COPC. Place information on contamination pathways and potential receptors in a new Section 5.4.

20. **Section 5.2 Potential Areas of Environmental Concern and Contaminants of Concern:**

    a) This section should be reserved for potential AECs that are known as needing to be investigated in order to determine the presence and extent of contamination to be remediated, if required. Rename this section "*PAECs to be Investigated & Their COPCs*".

    b) Reassess the PAECs present at the Site based on the assessments provided in Sections 4 and 5, and update the PAECs listed in Table 5.2. Provide a new Figure 3 showing the location and extent of all PAECs.

    c) The new Figure 3 needs to show all stockpiles formed by stripping surface soils from demolition zones. The stockpiles formed by stripping surface soil from the demolition zones should be properly labelled. The fiction that the stockpiles were formed as part of sediment basin construction should needs to be removed from the text and figures and properly described. The report needs to provide tabulated information on each stockpile

    d) For each PAEC where investigation is required, a table needs to be provided summarising the scope of investigation required to determine whether contamination is present that needs to be remediated. Make reference to the proposed investigation locations shown in Figure 7.

    e) Section 5.1 lists the contamination pathways associated with the AECs.

21. **Section 5.3 Land Use Setting**: Up-date this section to reflect the different land uses associated with the proposed development as mentioned in **Comment 5**.

22. **New Section 5.4 – Contamination Pathways and Potential Receptors**:

    a) Describe the contamination pathways and potential receptors relevant to the AECs / PAECs and land use settings.

b) The potential receptors should include on-site terrestrial ecosystems associated with the proposed residential land use.

c) Explain why there is a low risk that on-site contamination would affect off-site aquatic receptors in nearby creeks and the Georges River.

d) Explain why there is a low risk that on-site contamination would affect on-site users of extracted groundwater or recreational users of nearby waterways.

23. **Section 5.4 Direct Contact – Human Health**: Delete this section since it is covered by the new Section 5.4 described in **Comment 22**.

24. **Section 5.5 Inhalation / Vapour Intrusion – Human Health**: Delete this section since it is covered by the new Section 5.4 described in **Comment 22**.

25. **Section 5.6 Management Limits for Petroleum Hydrocarbon Compounds**: Delete this section since it is covered by the soil criteria in Section 6.

26. **Section 5.7 Aesthetics**:

    a) Mention that EPA guidance requires no anthropogenic odours or staining in soils / groundwater remaining at the Site. Also no putrescible waste or soil containing animal residues (Section 3.6.3, NEPL Schedule B1).

    b) Mention that inert waste in soil at a low-density residential site should be limited to trace concentrations (<5%). This concentration is based on the Australian Standard for Geotechnical Soil Classification, which defines “trace” constituents in soil as being < 5%. Also note that the ENM 2014 Order requires ENM to contain at least 98% natural soil.

    c) Include the need for the development to remove abandoned buried services and structures.

    d) I have no idea what paragraph 2 in Section 5.7 means – please remove it.

27. **Section 5.8 Terrestrial Ecosystems – Ecological Health**: Delete this section since it is covered by the soil criteria in Section 6.

28. **Section 5.9 Drinking Water Use**: Delete this section since it is covered by the new Section 5.4 described in **Comment 22**.

29. **Section 5.10 Recreational Water Use**: Delete this section since it is covered by the new Section 5.4 described in **Comment 22**.

30. **Section 5.11 Aquatic Ecosystems**: Delete this section since it is covered by the new Section 5.4 described in **Comment 22**.

31. **Section 6 Site Assessment and Remediation Acceptance Criteria**: Correct the section numbering.

32. **Section 6.1 Site Assessment Criteria**:

    a) Advise that the investigation reports identified:

    - Asbestos contamination in soils at the Site at concentrations exceeding site assessment criteria for Residential A land use;

- Soils at some areas of the Site had an unknown contamination risk that needed to be investigated for the COPCs;
- Groundwater was at an acceptable quality and no further investigation was necessary; and
- An unknown risk of LFG migrating into the Site across the southern boundary that needed to be investigated.

b) Advise that the site assessment criteria relevant to the RAP consists of soil criteria for the COPCs, aesthetic soil criteria, and LFG criteria. Explain that site assessment criteria have been adopted for a Residential A land use setting, since this setting defines the soils that need to be remediated.

c) Delete paragraph 1 and correct the table numbering.

d) Relabel the Table "Site Assessment Criteria" and replace the table with contents that specifies the HIL A and EIL A for each COPC. Separately refer to the aesthetic criteria specified in Section 5.7 as mentioned above.

33. **New Section 6.2 Remediation Acceptance Criteria**:

a) Given that the primary purpose of the RAP is to provide a strategy to remediate the Site, it is important that the RAP specifies the Remediation Acceptance Criteria to be used. The RAP should advise that the remediation criteria adopted by the proposed remediation strategy have been designed to best meet the ecologically sustainable development principles required by the CLM Act and EPA guidance. This has been achieved by adopting a range of remediation criteria that will maximise the potential to reuse treated soils at the site. The criteria and their application are:

- Off-site disposal for soil that is geotechnically or aesthetically unsuitable for reuse at the Site;
- Off-site disposal for soil contaminated above Commercial / industrial HIL D criteria;
- Re-use of treated soils as fill along road corridors if contaminated at or below Commercial / industrial HIL D criteria;
- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below Recreational EIL C criteria if placed at a depth of 0 to 2m below the final ground level[5];
- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below Recreational HIL C and EIL C criteria if placed at a depth of more than 2m below the final ground level;

[5] Section 2.5.6 of the NEPM (2013) Schedule B(2) guideline states that "*EILs apply principally to contaminants in the top 2 m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 m depth.*"

- Re-use of treated soils as fill on low-density residential land if contaminated at or below Residential EIL A criteria if placed at a depth of 0 to 2m below the final ground level[6];
- Re-use of treated soils as fill on low-density residential land if contaminated at or below Residential HIL A and EIL A criteria if placed at a depth of more than 2m below the final ground level.

b) Specify the statistical criteria that also needs to be met by remediated soils (i.e. 95% UCL of arithmetic mean, SD ≤ 0.5 SIL, and COV ≤ 1.2).

c) Specify the remediation criteria that applies to the need to remediate hotspots (i.e contamination > 250% SIL).

d) Summarise the remediation criteria in a table provided in Section 6.2.

34. **New Section 6.3 Imported Soil Criteria**:

a) Advise that soils imported to the Site as part of development work need to meet EPA VENM and ENM criteria.

b) Advise that landscaping soils imported to the Site as part of development work, especially those made from recycled materials, must meet the requirements of:

- The Australian Standard AS4454 for compost, soil conditioners, and mulches.
- Contain no asbestos.
- Meet all NSW EPA and Council requirements.
- Be managed under the NSW Resource Recovery Framework, which includes:

i. Processing: Wastes must be processed appropriately before they can be reused.

ii. Testing: Products must be tested to ensure they are fit-for-purpose and free from harmful contaminants.

iii. Specifications: Processors and users must adhere to specifications outlined in Resource Recovery Orders and Exemptions regarding the end product and its use.

35. **New Section 6.4 Geotechnical Criteria**: There is a risk that asbestos contaminated soil already excavated and stockpiled and/or asbestos contaminated soil still to be excavated will be geotechnically unsuitable for reuse at the Site. This is an important issue since asbestos contaminated soil infeasible / impractical to make geotechnically suitable will need to be disposed off-site at a suitably licensed landfill. Consequently, the revised RAP needs to provide geotechnical criteria that needs to be met by excavated soil before it is reused at the Site.

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[6] Section 2.5.6 of the NEPM (2013) Schedule B(2) guideline states that "*EILs apply principally to contaminants in the top 2 m of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 m depth.*"

36. **Section 7 Supplementary Contamination Assessment**:

    a) Delete the text in this section as it provides zero useful information and should be addressed as part of the remediation strategy in Section 9.

    b) Rename Section 7 "Extent of Remediation Required" and relocate relevant information from Section 10.2 ("Remediation Extents") into this section. Only summarise the AECs where the presence of contamination needing to be remediated. Delete reference to AEC04, AEC06, AEC07 shown in the existing Table 6.2.1 since these AECs should be regarded as PAECs that are subject to further investigation.

    c) Include other AECs that are known with their quantities (e.g. any existing stockpiles that are not yet included).

37. **Section 8 Supplementary Contamination Assessment Data Quality Objectives**: Delete this section as it provides zero useful information, much of it is repeated again in Section 11, and should be addressed as part of the remediation strategy in Section 9.

38. **New Section 9.1 Remediation Goals**:

    a) Move the text from Section 10.1 "Remedial Goal" into this new section 9.1. Revise the first sentence to advise that the main remediation goal is to render the Site suitable for the proposed development rather than just mentioning residential land use, since the proposed development includes three different land uses.

    b) Additional remediation goals that should be mentioned include:

    - Consider the principles of ecologically sustainable development in line with Section 9 of the Contaminated Land Management Act 1997;
    - Minimise waste generation under the Waste Avoidance and Resource Recovery Act 2001;
    - Manage site contingencies; and
    - Protect worker health and safety, environmental management, and community relations and site.

39. **Section 9.1 Remediation Strategy Development Rationale:** Renumber this section 9.2 and delete the current text in Section 9.1 as it is just meaningless and factually incorrect. I suggest replacing the text with the following:

    "*The primary contaminant of concern at the Site is asbestos because of the potentially large quantity of soil likely to be impacted at the Site, the high cost of disposing asbestos waste to landfill in NSW, and the practical constraints in locating and treating asbestos contamination. These practical constraints arise because of:*

    - *The difficulty in predicting where asbestos fragments are located across the ground surface and in fill;*
    - *The difficulty in identifying the location and extent of asbestos contamination using discrete sampling methods;*

- *The inability of any remediation technique to ensure that no asbestos remains buried in fill remaining at the Site while at the same time ensuring the preferred remediation strategy meets ecologically sustainable development (ESD) principles;*
- *The potential for excavated soil to become cross-contaminated when inadvertently mixed with uncontaminated soils;*
- *The potential for stripped surface soil from asbestos impacted areas to be geotechnically unsuitable for reuse at the Site, making it necessary to dispose of the soil off-site as Asbestos Waste;*
- *The need to remove visible asbestos found during earthworks; and*
- *The remediation criteria is demanding as it requires that no visible asbestos remains in surface soil (top 10 cm) for any future land use.*

Strategies have been adopted in this RAP to minimise, to the extent practicable, the potential impact of these constraints while best meeting ESD principles. These strategies include:

- *Designing the preferred remediation strategy and preparing this RAP after comprehensive investigations have been conducted across the Site, which have identified the main areas of asbestos contaminated fill that require remediation. These investigations have also identified the areas of the Site where there is a low risk of significant asbestos contamination;*
- *Having practically all the above ground buildings demolished as permitted by the Development Consent, which has allowed hazardous buildings materials to be disposed off-site, the presence of visible asbestos cleared from building footprints, and the condition of the soils across the building footprints investigated;*
- *Developing a methodical sequencing of remediation tasks;*
- *Selective excavation to minimise the potential for clean soils to become mixed with asbestos contaminated soil and/or become geotechnically unsuitable for on-site reuse;*
- *Tracking excavated soils from cradle-to-grave;*
- *Designing on-site soil treatment methods that will maximise the reuse of contaminated soils and minimise the generation of waste needing to be disposed off-site;*
- *Adopting remediation criteria for treated soils based on managing risk in accordance with EPA guidance; and*
- *Following the removal and remediation of known asbestos contamination in an area, protocols are adopted by the bulk earthworks / civil works to manage and remove isolated, infrequent ACM fragments as they are found."*

40. **Section 9.2 Remediation Options for Impacted Soil:** Renumber this section 9.3 and delete the current text in Section 9.2 as it is just meaningless and factually incorrect. I suggest reorganising Section 9.3 under the following subheadings:
    - Section 9.3.1 Overview;

- Section 9.3.2 Remediation Options for Non-Friable Asbestos Impacted Fill – Geotechnically Suitable in Present Condition;
- Section 9.3.3 Remediation Options for Non-Friable Asbestos Impacted Fill – Geotechnically Unsuitable in Present Condition; and
- Section 9.3.4 Remediation Options for Friable Asbestos Impacted Fill.

41. **New Section 9.3.1 Overview:** I suggest the following or similar text could be used for this section:

    "In general, the preferred hierarchy of options for site remediation and/or management specified by NSW EPA[7] guidance is set out in s.6(16) Assessment of Site Contamination Policy Framework of Schedules A and B of the NEPM. This preferred hierarchy is:

    - *on-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and*
    - *off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,*

    if the above are not practicable,

    - *consolidation and isolation of the soil on site by containment with a properly designed barrier; and*
    - *removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;*

    or,

    - *where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.*

    When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option.

    These options were considered in light of the known conditions on the site and the practicality and cost associated with on-site treatment, off-site treatment and wholesale excavation. In the case of the latter removal of all materials would simply burden another site and comprise a waste of diminishing landfill resources and would in any event be contrary to the principals of waste minimisation and sustainability espoused by the NSW EPA. Moreover, the ability to reuse treated soils on-site complies with NSW EPA's waste hierarchy[8] as follows:

    - *Waste Avoidance - including action to reduce the amount of waste generated by households, industry and all levels of government;*

[7] Section 4.3.2, NSW EPA (2017) Site Auditor Guidelines
[8] https://www.epa.nsw.gov.au/Your-environment/Recycling-and-reuse/warr-strategy/The-waste-hierarchy

- *Resource recovery - including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources; and*
- *Waste disposal - including management of all disposal options in the most environmentally responsible manner.*

As shown in the figure below, the off-site disposal of waste is the least preferred option whereas waste avoidance, is the most preferable option.



The RAP has evaluated remediation options for the three main types of contaminated soil needing to be remediated, these being:

- *Non-friable asbestos impacted fill – geotechnically suitable for reuse in present condition;*
- *Non-friable asbestos impacted fill – geotechnically unsuitable for reuse in present condition; and*
- *Friable asbestos impacted fill.*

For other types of soil contamination that may be found at the Site, appropriate remediation strategies will be developed, if required, consistent with the methodology used for the three main types of contaminated soil described above. This approach is practical and feasible because the presence of such contamination remains unknown, is likely to be of minor extent if present, and the availability of proven remediation technologies to deal with heavy metal, petroleum hydrocarbon contamination, and/or LFG.

42. **New Section 9.3.2 Remediation Options for Non-Friable Asbestos Impacted Fill – Geotechnically Suitable in Present Condition**: In this new section advise that:

    a) This soil type is contaminated with bonded asbestos fragments but is geotechnically suitable for reuse in its present condition. This means that the soil does not contain more than trace quantities of vegetation, topsoil and/or demolition waste. Consequently, after the bonded asbestos has been removed and is shown to meet the remediation criteria, the treated soil can be placed and compacted in a designated area having a land use consistent with the selected remediation criteria (i.e. Residential A for low-density residential, Recreational C for public open space/parkland, and Commercial / industrial D for roadways).

    b) The remediation options relevant to this type of contaminated soil are considered to be:

        - Option 1: Do nothing;
        - Option 2: On-site treatment to an acceptable level and reuse;
        - Option 3: Excavation and containment on-site in a capped cell;
        - Option 4: Leave in-situ and cover with a clean soil cap; and
        - Option 5: Off-site disposal to landfill.

    c) Summarise the results of the remediation options assessment in a table with a separate row for each of the five options and columns labelled “Option”, “Evaluation”, and “Option Ranking”. This new Table 9.1 should replace Table 5.4.2 in the existing RAP, although elements of Table 5.4.2 could be incorporated into the new table.

    d) The alternate outcomes under the “Option Ranking” column could be “Not applicable”, “1 Preferred”, “2 Contingency”.

    e) In my opinion, Option 2 is likely to be ranked as “1 Preferred”.

43. **New Section 9.3.3 Remediation Options for Non-friable Asbestos Impacted Fill – Geotechnically Unsuitable for Reuse in Present Condition**: In this new section advise that:

    a) This soil type is contaminated with bonded asbestos fragments and also contains vegetation, topsoil and/or demolition waste that makes the soil geotechnically unsuitable for reuse at the Site in its present condition. This means that treating the soil to remove bonded asbestos fragments is not practical if the soil can not be reused on-site because it remains geotechnically unsuitable. On-site treatment and reuse of the soil only becomes feasible if the presence of vegetation, topsoil and/or demolition waste can also be reduced to low and acceptable levels, thereby making the soil meet both the remediation and geotechnical criteria. If such a condition can be achieved, then the treated soil can be placed and compacted in a designated area having a land use consistent with the selected remediation criteria (i.e. Residential A for low-density residential, Recreational C for public open space/parkland, and Commercial / industrial D for roadways).

    b) The remediation options relevant to this type of contaminated soil are considered to be the same as those described above in Section 9.2.2.

c) The new issues that need to be considered by the remediation options for this soil type are:

- Option 2: On-site treatment to an acceptable level and reuse: The bonded asbestos fragments would need to be removed first followed by using a power screen to remove excessive amounts of vegetation, topsoil and/or demolition waste. However, the portion of screened material that remains geotechnically unsuitable will need to be disposed off-site as Asbestos Waste;
- Option 3: Excavation and containment on-site in a capped cell: This approach may not be suitable for areas that can't tolerate excessive settlement.

d) Summarise the results of the remediation options assessment in a table as previous described in **Comment 0(b)**. This new Table 9.1 should replace Table 5.4.2 in the existing RAP, although elements of Table 5.4.2 could be incorporated into the new table.

e) In my opinion, both Options 2 and 5 are likely to be ranked as "1 Preferred" due to the need for at least some of the soil needing to be disposed off-site as Asbestos Waste.

44. **New Section 9.3.4 Remediation Options for Friable Asbestos Impacted Fill**: In this new section advise that:

a) This soil type is contaminated with friable asbestos, which is a type of contamination that cannot be removed from soil due to its potential to release asbestos fibres and because the remediation criteria for all land uses of 0.001 %w/w is less than the concentration that can be reliably measured by lab tested conducted in accordance with the Australian Standard methodology.

b) The remediation options relevant to this type of contaminated soil are considered to be the same as those described above in Section 9.2.2.

c) The new issues that need to be considered by the remediation options for this soil type are:

- Option 2: On-site treatment to an acceptable level and reuse: On-site treated is not feasible

d) Summarise the results of the remediation options assessment in a table as previous described in **Comment 0(b)**. This new Table 9.1 should replace Table 5.4.2 in the existing RAP, although elements of Table 5.4.2 could be incorporated into the new table.

e) In my opinion, Option 5 is likely to be ranked as "1 Preferred" because it is capable of remediating this type of contaminated soil and because the investigation data indicates that only relatively small quantities of friable asbestos impacted fill are present at the Site.

45. **Section 9.3 Remediation Options for Impacted Groundwater and Ground Gas:** This section is unnecessary as it will be addressed by the final paragraph in Section 9.2, as recommended in **Comment 41** above. This section should be deleted.

46. **Section 9.4 Preferred Remediation Options**:

    a) Change the section label to "*Summary of Preferred Remediation Options*" since more than one methodology will be required to remediate the three main types of asbestos contaminated soil.

    b) Delete Table 5.4.1 since most of the AECs listed should be classified as PAECs subject to further investigation.

    c) Prepare a new Table 9.2 that just refers to the three different contaminated soil types assessed in Section 9.2. Have a second column that identifies the preferred remediation option for the contaminated soil type. Have a third column that identifies the remediation option to be considered as a contingency measure.

    d) A new Table 9.3 could be used to summarise the known AECs identified in the revised Section 5.1 (refer **Comment 19**) that need to be remediated, with the type of asbestos contaminated soil present.

47. **New Section 9.5 Management Framework**:

    a) Advise that Council's Contaminated Land Policy[9] requires that *"Prior to determining development applications, Council must be satisfied that remedial measures have been, or will be, undertaken in accordance with the submitted RAP, to make the site suitable for the proposed use.*" This RAP achieves this objective by specifying a management framework that aims to achieve this objective.

    b) Advise that the management framework adopted by this RAP involves:

    - All remediation work at the Site needs to be undertaken in accordance with the RAP and any interim audit advice approved by Council and referenced in a Development Application;
    - Any changes to the remediation strategy are to be approved in writing by the Site Auditor and Council prior to the change being implemented; and
    - A generic task breakdown structure has been designed with hold points at the end of critical tasks.

48. **Section 10 Remedial Action Plan**: Change the title of Section 10 to "*Sequency of Remediation*" since this more accurately describes the information to be provided in this section.

49. **New Section 10.1 Overview**:

    a) Advise that the remediation of contamination at the Site will involve a large number of separate tasks, with the sequencing of these tasks made more complicated by the proposed development to occur in 7 stages over a period of several years. Consequently, developing a methodical sequencing of remediation tasks is an important strategy adopted by this RAP to minimise, to the extent practicable, the potential impact of the constraints listed in the new Section 9.2 (refer **Comment 39**) while best meeting ESD principles.

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[9] Section 2.3.3, Canterbury Bankstown (22 August 2017) "*Contaminated Land Policy*"

b) Advise that the RAP has addressed this need by designing a generic sequencing of remediation tasks that can be applied to any stage of the development. The sequencing of tasks has sought to provide a logical order that remediation work should be undertaken irrespective of the type and extent of contamination that may be present in a stage. Where a remediation task is not relevant for a particular Development Stage, then the next remediation task is considered and so on until the particular Development Stage has been fully remediated and validated. At this final time this area of land will be considered to be suitable for the proposed land use/s and a validation report will be prepared for that area, which will allow a Section A SAS / SAR to be issued followed by the commencement of above ground construction work.

c) Advise that the remediation of contamination in an area of the Site and the validation of its final condition as being suitable for the proposed land use/s can only be completed when final site levels have been reached and no further bulk earthworks are required. This is because of the need to ensure that:

- All soils used as backfill at the Site have been tracked from cradle-to-grave;
- Only treated soils that have been validated as meeting the remediation criteria listed in Section 6.2, and approved by the Site Auditor, are used as backfill in areas of the Site having a land use consistent with the remediation criteria;
- Any isolated fragment of asbestos found during the excavation of soil not requiring remediation has been removed and validated;
- Surface soils that form the final site level contain no visible asbestos, as required by the remediation acceptance criteria listed in Section 6.2; and
- Imported soils used in bulk earthworks meet the EPA criteria for VENM and ENM as outlined in Section 6.3; and
- Imported landscaping soils meet the remediation acceptance criteria in Section 6.3.

d) Advise that this means it is not feasible for:

- Remediation work across the entire Site to be completed prior to the commencement of bulk earthworks at the Site;
- Remediation work within a Development Stage or small part of the Site to be completed prior to the commencement of bulk earthworks at that area; and
- A single validation report to be prepared by the environmental consultant at the end of all remediation work required at the Site.

e) Advise that this means that:

- It is critical for the contractor to fully understand the requirements of this RAP and to manage the remediation and movement of soils at the Site in accordance with this RAP;
- Both remediation work and bulk earthworks will need to be undertaken in parallel at different parts of the Site and sequenced in a manner to facilitate the staging plan of the proposed development; and

- Validation reports will need to be prepared by the environmental consultant and site audit documentation will need to be prepared by the Site Auditor progressively as final site levels are achieved at a particular stage of the development.

f) Delete Section 10.4 in the existing RAP since it provides no useful information.

50. **New Section 10.2 Generic Task Breakdown Structure**: This section should describe the generic tasks breakdown structure that can be applied to any Development Stage. In my opinion, the generic task breakdown structure include the following 11 tasks:
    - Task 1: Early work and protection of existing trees;
    - Task 2: Investigation of LFG risk at southern boundary;
    - Task 3: Additional demolition work and testing of building footprint;
    - Task 4: Remediate existing soil stockpiles;
    - Task 5: Remove approved vegetation and deleterious surface materials;
    - Task 6: Excavate and remediate asbestos impacted fill;
    - Task 7: Excavate and remediate other types of contamination and unexpected finds;
    - Task 8: Excavate remaining soils to final excavation level;
    - Task 9: Backfill excavated / treated on-site soils in fill areas;
    - Task 10: Import VENM or ENM soils to fill areas; and
    - Task 11: Final surface soil inspection.
51. **New Section 10.3 Task 1 Early Work and Protection of Existing Trees**:
    a) In this section include paragraphs one and two from Section 10.3.1 of the existing RAP but delete paragraph 3 since the timing of the remediation work is not feasible for the reasons given in **Comment 49**.
    b) In this section also include the information in Section 10.3.2 of the existing RAP.
    c) Additional documentation that the Contractor needs to prepare includes:
        - A Construction Environmental Management Plan (CEMP); and
        - A materials tracking plan as required by the remediation work, which can form part of the CEMP.
    d) In this section include the text from Section 10.3.14 in the existing RAP "*Existing Trees*".
    e) Advise that a project inception meeting will need to be held between the Developer, Remediation / Civil Contractor, Environmental Consultant and Site Auditor. The inception meeting should cover, amongst other things, the requirements of this RAP and the roles and responsibilities of the relevant parties.
    f) The environmental consultant will need to inspect the Site and confirm that all environmental and WHS measures have been properly established.

g) Advise that no Task 3 work in any part of the Site is to occur until the environmental consultant has advised the Site Auditor in writing that all other Task 1 early work has been completed, and the Site Auditor has reviewed and approved the Task 1 documentation and issued a written approval for Task 3 work to proceed This requirement represents a HOLD POINT on the commencement of Task 3 work.

52. **New Section 10.4 Task 2 Investigation of LFG Risk at Southern Boundary**:

a) In my opinion, the only investigation that needs to be undertaken at the Site prior to the commencement of site works is the investigation of LFG risk along the southern property boundary. This is because:

- The investigation of soils under the building footprint at the child care centre can occur as part of the Task 3 demolition work. In this way, the LFG investigation may commence without waiting for the completion of the Task 3 demolition work, which is a restriction included in the existing RAP;
- The friable asbestos located at EBH1 within AEC01 needs to be remediated and validated as part of Task 6 rather than further investigated; and
- Extensive investigations have been undertaken at the Site that negate the need to undertake further investigations in thin, relatively small areas and under carpark areas, as shown by white cross-hatching in Figure 2 and the yellow hatching in Figure 3. The presence of asbestos contamination in any of these areas should be capable of being remediated as part of the chasing out of asbestos contamination at AEC03 in Task 6.

b) This section of the report needs to describe the scope of the proposed investigation of LFG along the southern property boundary and the proposed investigation methodology in detail.

c) This new section 10.4 should replace section 10.3.4 in the existing RAP.

d) Advise that no Task 3 work in any part of the Site is to occur until:

- The environmental consultant has issued a contamination assessment report prepared in accordance with EPA guidance documenting the LFG investigation and assessment. In the event that LFG concentrations exceed the site assessment criteria, the investigation will also need to determine the risk that LFG poses to the proposed development and detail any remedial measures required; and
- The Site Auditor has reviewed and issued a written approval of the LFG assessment report and issued a written approval for Task 3 work to proceed.

These requirements represent a HOLD POINT on the commencement of Task 3 work and is required because Stage 1 of the Development extends down close to the southern property boundary.

53. **New Section 10.5 Task 3 Additional Demolition Work & Testing of Building Footprint**:

    a) The purpose of this section is to specify:

    - The work practices and environmental requirements needing to be met by the contractor during demolition of the former childcare centre;
    - The demolition clearance reporting requirements that need to be met by the environmental consultant; and
    - The scope and methodology to be used by the environmental consultant to investigate the quality of soils across the building footprint, and in particular to check whether asbestos or heavy metal contamination exists that needs to be remediated as part of Task 6 or 7 work.

    b) This new section 10.5 should replace section 10.3.3 in the existing RAP since it provides zero guidance on the environmental requirements that need to be met by this work,

    c) EGA needs to describe the work practices and environmental requirements needing to be met by the contractor during demolition of the former childcare centre.

    d) EGA needs to describe the demolition clearance reporting requirements that need to be met by the environmental consultant.

    e) EGA needs to describe the scope and methodology to be used by the environmental consultant to investigate the quality of soils across the building footprint, and in particular to check whether asbestos or heavy metal contamination exists that needs to be remediated as part of Task 6 or 7 work.

    f) Advise that no Task 4 work in the Stage 3A and 3B Conservation Area of the Site is to occur until:

    - The environmental consultant has issued a Demolition and Contamination Assessment report prepared in accordance with EPA guidance documenting the demolition work and investigation of soil contamination under the building footprint of the former childcare centre. In the event that contamination is found to exceed the site assessment criteria, the report will need to detail any remedial measures required; and
    - The Site Auditor has reviewed and issued a written approval of the Demolition and Contamination Assessment report and issued a written approval for Task 4 work to proceed in the Stage 3A and 3B Conservation Area.

    These requirements represent a HOLD POINT on the commencement of Task 3 work in the Stage 3A and 3B Conservation Area.

54. **New Section 10.6 Task 4 Remediate Existing Soil Stockpiles**: The existing RAP provides no description of the stockpiled material and whether it needs to be remediated. The Demolition Clearance Report advises that soils were stripped from across Demolition Zones 1 to 4 and placed in stockpiles located across the Site. In my interim audit advice dated 9/10/25 on the EGA Demolition Clearance Report, I have recommended that an extensive amount of additional information needs to be provided on the soils that were stripped and stockpiled. I am still waiting for the revised

Demolition Clearance Report to be issued. In light of this data gap, I have assumed that the stockpiled soil is contaminated by asbestos and is geotechnically unsuitable in its present condition because of the presence of an excessive amount of vegetation, topsoil and/or demolition waste.

This new section of the RAP needs to provide a generic description of the protocols that will need to be implemented for any existing soil stockpiles located in a particular Development Stage of the Site and include the following information:

a) A brief description of the stockpiled soils and their contamination / geotechnical status.

b) Advise that the movement of all materials in existing soil stockpiles needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

c) A detailed methodology for removing visible asbestos from the stockpiled soil for the case where it is considered that either the stockpiled soil is geotechnical suitable or can be made geotechnically suitable. This needs to include, but not be limited to:

- The location where stockpiled soil will be treated to remove visible asbestos;
- Design requirements for the asbestos treatment area;
- The batch size to be used, the thickness and area to be occupied by each batch after it has been spread out;
- The qualification and experience of asbestos pickers;
- How soil will be spread out at the treatment area;
- How soil will be raked in passes perpendicularly aligned;
- How visible asbestos removed, weighed, its condition assessed and documented;
- When will all visible asbestos be considered to have been removed from a batch of treated soil;
- The frequency when a soil sample will be taken a lab tested to check for friable asbestos; and
- The temporary stockpiling of treated soil.

d) A protocol for removing friable asbestos contaminated soil from the treated soil stockpile in the event that a lab sample measures friable asbestos exceeding the Remediation Acceptance Criteria of 0.001 %w/w.

e) Protocols for stockpiling treated soil where the soil is geotechnically suitable. These soils will need to be stockpiled until Task 9 backfilling work is allowed to commence.

f) A detailed methodology for processing stockpiled treated soil that is geotechnically unsuitable in its present condition but can be made geotechnically suitable. This could include removing geotechnically unsuitable material at the same time that visible asbestos is being removed, or by using a power screen to remove geotechnically unsuitable material after all visible asbestos has been removed.

Details on the off-site disposal of geotechnically unsuitable material removed from the soil needs to be provided.

g) A detailed methodology for removing asbestos contaminated stockpiled soil from the site and disposing it as Asbestos Waste at a suitably licensed landfill where it is considered not practical and/or infeasible to treat the soil and make geotechnically suitable.

h) A detailed methodology for remediating and validating surface soils remaining across a soil treatment area following the completion of soil treatment.

i) The revised RAP needs to specify the frequency that the environmental consultant will inspect and verify soil treatment operations at the Site are being undertaken in accordance with the RAP, confirm that all environmental and WHS measures are being properly implemented, and the requirements for documenting all site inspections on a field record supported by photos. A copy of each field record needs to be provided in the validation report prepared for the particular Development Stage.

j) Advise that no Task 5 work is to occur in the particular Development Stage where the existing soil stockpiles are located until:

- All existing soil stockpiles in that Development Stage have been remediated and, if remaining on-site, have been validated as meeting the Remediation Acceptance Criteria;
- The surface soils remaining in the stockpile area have been validated as meeting the Remediation Acceptance Criteria;
- An interim report has been prepared by the Environmental Consultant on this remediation work, which concludes that all existing soil stockpiles and stockpile footprints in the particular Development Stage have been remediated and validated as meeting the Remediation Acceptance Criteria; and
- The Site Auditor has reviewed and approved the Task 5 interim report and issued a written approval for Task 4 work to proceed in the particular Development Stage where the existing soil stockpiles were located.

These requirements represent a HOLD POINT on the commencement of Task 5 work for the particular Development Stage where existing soil stockpiles are located.

55. **New Section 10.7 Task 5 Remove Approved Vegetation & Deleterious Surface Materials**:

a) Due to the ramifications that geotechnically unsuitable soil have on the remediation of asbestos contamination at the Site, the revised RAP needs to provide a detailed methodology for removing and disposing approved vegetation and deleterious surface materials from areas where excavation and remediation work is required.

b) Advise that the movement of all materials needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

c) Advise that no Task 6 work is to occur in the particular Development Stage until:

- All Task 5 work in the particular Development Stage has been completed;

- The Environmental Consultant advises the Site Auditor in writing that all Task 5 work in a particular Development Stage has been completed; and
- The Site Auditor has issued a written approval for Task 6 work to proceed in the particular Development Stage.

These requirements represent a HOLD POINT on the commencement of Task 6 work for the particular Development Stage.

56. **New Section 10.8 Task 6 Excavate & Remediate Asbestos Impacted Fill**: This new section needs to cover the excavation and remediation of both non-friable asbestos and friable asbestos and hence will need to be split up into two sub-sections.

57. **New Section 10.8.1 Friable Asbestos Impacted Fill**:

a) This new section replaces but can incorporate relevant parts from Sections 10.3.6, 10.3.8 and 10.3.12 in the existing RAP.

b) Advise that the movement of all asbestos impacted fill needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

c) Provide more detail on how areas of friable asbestos impacted fill are to be located and how the area to be remediated is to be defined and set-out.

d) Advise that excavated soils are to be loaded directly into trucks to minimise the risk of friable asbestos cross-contaminating other soils.

e) Advise that the LAA will need to inspect the excavation within 5 days following the removal of the friable asbestos impacted soil and prior to any disturbance of the excavation and the area surrounding the excavation out to a distance of 10m from the sides of the excavation.

f) Provide procedures for chasing out additional asbestos impacted fill if the LAA identifies visible asbestos remaining in the sides of the excavation or the lab tests measure asbestos in the soil validation samples. Incorporate information provided in Section 10.3.12 of the existing RAP.

g) Advise that all areas of friable asbestos impacted fill in a particular Development Stage need to be excavated and remediated prior to any other excavation work occurring in the particular Development Stage.

58. **New Section 10.8.2 Non-Friable Asbestos Impacted Fill**:

a) This new section replaces but can incorporate relevant parts from Sections 10.3.7, 10.3.9 to 10.3.12 in the existing RAP.

b) Advise that the movement of all asbestos impacted fill needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

c) Provide more detail on how areas of non-friable asbestos impacted fill are to be located and how the area to be remediated is to be defined and set-out.

d) Advise that excavated soils are to be loaded directly into trucks and transported to a treatment pad to minimise the risk of non-friable asbestos cross-contaminating other soils.

e) Provide details on the locations where soil treatment areas are to be located, the design of the treatment area, temporary stockpiles and treatment pads. What is their sizes? How is soil to be moved from temporary stockpiles to the treatment pad.

f) What is the required training / experience of the raker?

g) Provide more details on the raking process that will be used. What are the design requirements for the rake? Will raking occur systematically in perpendicular directions until all visible asbestos has been removed? How long is raking to occur for each 100mm treatment pad? Will the weight of asbestos recovered from each treatment pad be recorded so that the concentration of visible asbestos in the treatment pad soil can be determined?

h) Provide more details on where treated soil will be stockpiled.

i) Advise that the LAA will need to inspect the excavation within 5 days following the removal of the non-friable asbestos impacted soil and prior to any disturbance of the excavation and the area surrounding the excavation out to a distance of 10m from the sides of the excavation.

h) Provide procedures for chasing out additional asbestos impacted fill if the LAA identifies visible asbestos remaining in the sides of the excavation or the lab tests measure asbestos in the soil validation samples. Incorporate information provided in Section 10.3.12 of the existing RAP.

j) Advise that all areas of non-friable asbestos impacted fill in a particular Development Stage need to be excavated and remediated prior to commencing Task 7 work in the particular Development Stage.

k) Advise that no Task 8 work is to occur in the particular Development Stage until:

- All asbestos impacted fill in the particular Development Stage has been removed and the remaining soils validated as meeting the asbestos Remediation Acceptance Criteria. This work need to be documented by the Environmental Consultant in an interim report; and
- The Site Auditor has reviewed and approved the Task 6 interim report; and
- All Task 7 work in the particular Development Stage has been completed and the Site Auditor has issued a written approval for Task 8 work to proceed in the particular Development Stage where contaminated soil has been removed.

These requirements represent a HOLD POINT on the commencement of Task 8 work for the particular Development Stage.

59. **New Section 10.9 Task 7 Excavate & Remediate Other Types of Contamination & Unexpected Finds**: This new section replaces but can incorporate relevant parts from Sections 10.3.12.2 and 10.3.12.3 in the existing RAP. Divide this section into two sub-sections:

60. **New Section 10.9.1 Other Types of Contamination:**

a) Advise that the Task 3 investigation and the Task 6 excavation work may find other types of contamination that are known or suspected of being present at the Site but

whose presence and location could not be determined until site work commenced. Identify and describe these other types of potential contamination, which include:

- Contaminated soil across the former building footprint of the former childcare centre that was investigation as part of Task 3;
- Rubbish and dumped waste in the Stage 3a and 3b Conservation Area;
- Abandoned septic tanks associated with the past rural use of the Site that may contain pathogens, asbestos, chemical residues, other hazardous building materials and waste;
- Abandoned buried services that may contain asbestos, other hazardous building materials, and waste; and
- USTs that were not removed in the western part of the Site together with associated petroleum hydrocarbon contamination.

b) Provide procedures for the remediation and validation of each of the above types of contamination.

c) Advise that the movement of all contamination and waste needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

d) Advise that no Task 8 work is to occur in the particular Development Stage until all Task 6 and 7 work in the particular Development Stage has been completed and the Site Auditor has issued a written approval for Task 8 work to proceed in the particular Development Stage. This requirement represents a HOLD POINT on the commencement of Task 8 work for the particular Development Stage.

61. **New Section 10.9.2 Unexpected Finds:**

a) Advise that site work may find contamination and buried materials not anticipated and addressed by the Conceptual Site Model (CSM), which are referred to as Unexpected Finds. The types of contamination and materials considered to be Unexpected Finds at the Site are:

- Other USTs not recorded in the available historical information;
- Buried containers and drums; and
- Powders and other suspicious buried material.

b) Include the Unexpected Finds flowchart given in the existing RAP.

c) Advise that the movement of all contamination and waste needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

62. **New Section10.10 Task 8 Excavate Remaining Soils to Final Excavation Level**: Advise that there is a high likelihood that isolated asbestos fragments will be found in fill not located in designated remediation areas. To manage the safe removal of these fragments the RAP needs to provide the following procedures.

a) All site workers are to attend regular toolbox meeting where the likelihood of isolated fragments of bonded asbestos being found in fill outside designated remediation areas is discussed along with the procedures that need to be taken by workers to dealing with such fragments.

b) Workers are to notify the site manager when isolated asbestos fragments are found.

c) Fill found to contain visible asbestos is to be placed in a stockpile for examination by the environmental consultant.

d) The environmental consultant is to inspect the Site on a weekly basis during periods when Task 8 excavation work is occurring at the Site. During these inspections, the consultant is to:

- Inspect stockpiles where visible asbestos was found and either remove the asbestos fragments if few in number or direct that the soil stockpile be remediated using Task 6 procedures;
- Inspect excavated surfaces and remove any visible asbestos found;
- Identify any parts of an excavation area where asbestos impacted fill needs to be remediated using Task 6 procedures; and
- Document the findings made during each inspection on a field record that is supported by photos, with copies of all field records to be included in the validation report prepared for the particular Development Stage.

e) Advise that no Task 9 work is to occur in the particular Development Stage until:

- All Task 8 work has been completed in the particular Development Stage;
- The Environmental Consultant has prepared an interim report on the Task 8 work and concluded that no contamination remains in the particular Development Stage exceeding Remediation Acceptance Criteria; and
- The Site Auditor has inspected all final excavation surfaces in a particular Development Stage and issued a written approval for Task 9 work proceed in the particular Development Stage.

These requirements represent a HOLD POINT on the commencement of Task 9 work for the particular Development Stage.

63. **New Section 10.11 Task 9 Backfill Excavated / Treated On-site Soils in Fill Areas**:

a) The RAP needs to provide procedures for the backfilling of excavations with on-site soils that have been treated or otherwise excavated at the Site. This is because there remains a risk that visible asbestos remains in asbestos impacted fill that has been treated, in excavated fill that has not been treated, and in excavated natural soils that may have been inadvertently cross-contaminated.

b) For the reuse of asbestos impacted fill that has been treated to meet the Remediation Acceptance Criteria, preference should be given to using this soil as backfill in:

- Proposed road corridors because they have the least sensitive land use. The next preferred area is land to be used for public open space/parkland; and
- At the base of excavated areas at the locations where the fill is deepest.

c) No treated asbestos impacted fill is to be placed in a residential area unless prior written approval is issued by the Site Auditor.

d) The preference should be to use excavated natural soil and untreated fill in the upper part of any fill area but to the much lower risk of visible asbestos being present in these soils.

e) Advise that no further excavation or remediation work is to occur in a particular Development Stage following the completion of Task 8 work.

f) Advise that no vehicles containing excavated soils from other parts of the Site are to access the particular Designated Stage where Task 9 and later work is being undertaken.

g) Advise that prior to the commencement of Task 9 work in a particular Development Area, signage and barricades need to be erected at access points to the area to isolate it from other part of the Site where remediation and excavation work is still occurring.

h) Advise that the movement of all treated fill used in Task 9 needs to be tracked from cradle-to-grave in accordance with the approved materials tracking plan.

i) Require the geotechnical technician responsible for conducting in-situ soil density tests to:

   i. Notify the Site Manager of any evidence of visible asbestos or other suspected contamination found during soil density testing so that it can be checked out by the Environmental Consultant; and

   ii. Require the Compaction Test Certificates to advise whether or not any evidence of visible asbestos or other suspected contamination was found during soil density testing.

64. **<u>New Section 10.13 Task 10 Import VENM or ENM Soils to Fill Areas</u>**:

a) The RAP needs to provide protocols for the importation of fill to be used during bulk earthworks at the Site. Only VENM and ENM are to be imported to the Site for this work. These protocols need to include, but no be limited to:

- VENM / ENM soils are only to be imported from known locations where there is no history of contamination;
- VENM / ENM soil is to be tested, validated and documented in accordance with EPA guidance, with copies of this documented to be included in validation reports;
- Only VENM / ENM soil approved in writing by the environmental consultant is to be imported to the Site;
- All VENM / ENM imported to the Site is to be tracked from source to Site;
- The Contractor is to ensure that only approved trucks are used to import VENM / ENM soil to the Site;
- All VENM / ENM soil is to be inspected upon delivery to the Site by the Contractor. Any materials that are suspected of being contaminated or are inconsistent with EPA standards for VENM / ENM are to be rejected by the Contractor and are to be removed from the Site; and

- The Environmental Consultant is to validate VENM / ENM soil imported to the Site.

b) This new section replaces Section 10.4.2 in the existing RAP.

c) Include parts of Section 13.13 in the existing RAP in this Section.

65. **New Section 10.12 Task 11 Final Surface Soil Inspection**: The RAP needs to provide protocols for the environmental consultant to conduct a final inspection of surface soils at the Site to ensure that no visible asbestos or other forms of contamination are present across the particular Development Stage. The results of this inspection are to be documented in the validation report prepared for the particular Development Stage.

66. **Section 11 Remediation and Validation Data Quality Objectives**: Rename this section "*Validation & Waste Sampling and Testing Programs*", since documentation on the DQOs only provides a small part of the validation program. This section needs to provide information under the following sub-headings:

- Section 11.1 Classification of Waste to be Disposed Off-site (All tasks). Include relevant parts from Section 13.2 of the existing RAP.
- Section 11.2 Former Childcare Centre Building Footprint (Task 3)
- Section 11.3 Existing soil stockpiles (Task 4);
- Section 11.4 Excavations in Asbestos Remediated Areas (Task 6)
- Section 11.5 Treated Asbestos Impacted Soil (Task 6)
- Section 11.6 Stage 3A and 3B Conservation Area (Task 7);
- Section 11.7 Buried Asbestos Pipes (Task 7)
- Section 11.8 Excavations for Pits and USTs (Task 7)
- Section 11.9 Unexpected Finds (Task 7)
- Section 11.10 Quality Assurance Plan where summarised parts of Section 11 in the existing RAP can be included, where relevant.

67. **Section 12 Reporting:** Advise that the Environmental Consultant will be required to undertake various types of reporting throughout the remediation and bulk earthworks program. These types of reporting include:

- Site inspection reports;
- Interim reports at the end of specified remediation tasks completed for a particular Development Stage;
- Validation reports prepared at the completion of remediation and bulk earthworks for a particular Development Stage.

a) New Section 12.1 Site Inspection Reports: Describe the information that the Environmental Consultant needs to prepare for each inspection conducted at the Site, with copies of these reports to be provided in the validation reports.

b) New Section 12.2 Interim Reports: Describe the information that the Environmental Consultant needs to provide in each Interim Report prepared at the end of specified remediation tasks completed for a particular Development Stage.

c) Section 12.3 Validation Reports: Describe the information that the Environmental Consultant needs to provide in each validate report prepared at the completion of remediation and bulk earthworks for a particular Development Stage. Include relevant information from Section 12 in the existing RAP. In addition to this information, each validation reports needs to include detailed information on

   i. The remediation work completed for each of the 11 remediation tasks;

   ii. Material tracking document sufficient to allow the Site Auditor to determine whether contaminated materials at the Site were likely to have been tracked from cradle-to-grave;

   iii. Details of earthworks completed for the particular Development Stage;

   iv. Imported fill documentation;

   v. Final survey plans of the particular Development Stage;

   vi. The supervision work undertaken by the environmental consultant during the remediation work, supported by photos and copies of site inspection reports; and

   vii. Reference to interim reports provided by the Environmental Consultant that had already been issued during the remediation work.

68. **Section 13 Site Management Plan**:

    a) Delete Section 13.2 in the existing RAP since the information is to be provided in Section 11.1 of the revised RAP.

    b) Delete Section 13.13 in the existing RAP since the information is to be provided in Section 10.13 of the revised RAP.

    c) Include a new sub-section detailing the site supervision work to be undertaken by the Environmental Consultant / Occupational Hygienist.

    d) Up-date the Table 13.20.1 Register of Contacts by replacing SEG with EGA.

69. **Figures**: Revise the figures to address Site Auditor review comments provided in interim audit advices 25/09/25 (for the EGA DSI) and on 9/10/25 (for the EGA Demolition Clearance Report).

70. **Appendix A Previous Reporting**: Remove this appendix since the previous reports stand on their own and the RAP refers to them in Section 16.

IAN SWANE & ASSOCIATES P/L

Should further information need to be provided explaining any of the above review comments, please don't hesitate to contact me. In the interim, please advise me when a complete final copy of the RAP will be provided so I can complete the Section B SAS / SAR.

Yours sincerely



Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
Director, Ian Swane & Associates
Certified Site Contamination Specialist
Phone: 0418 867 112
Email: iswane@bigpond.com

Appendix D. Site Auditor Photographs

Site inspection 21/10/24



Photo 1: View from SW corner of Site looking east to south

Site inspection 6/02/25



Photo 2: Building demolition work



Photo 3: Cleared building footprint



Photo 4: Building demolition work



Photo 5: Building demolition work



Photo 6: Fallen tree on building



Photo 7: Close-up of fallen tree on building



Photo 8: Temporary stockpile of scrapped soil from building footprint

Site inspection 27/10/25



Photo 9: Cleared area in NW corner of Site



Photo 10: Surface drain and hydromulch along property boundary in NW corner of Site



Photo 11: Cleaning out surface drains in NW corner of Site



Photo 12: Stormwater basin in NW corner of Site



Photo 13: Cleared area along western Site boundary



Photo 14: Surface water drain along western boundary



Photo 15: Cleared area along western side of Site




Photo 16: Temporary stockpiles in SW corner of Site




Photo 17: Cleared areas in SW corner of Site



Photo 18: Stormwater basin in SW corner of Site



Photo 19: Temporary stockpiles in southern part of Site

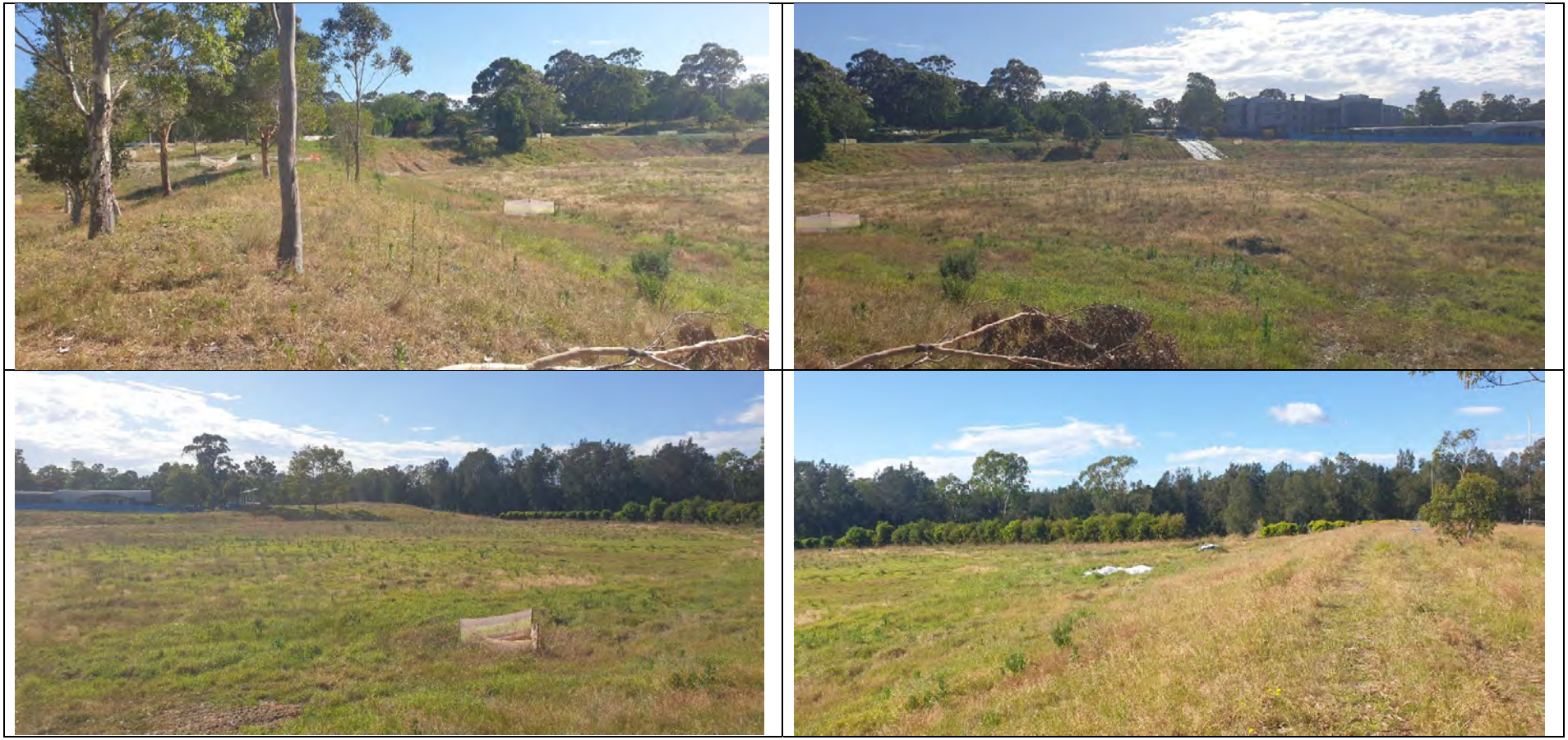


Photo 20: Former sports field in southern part of Site

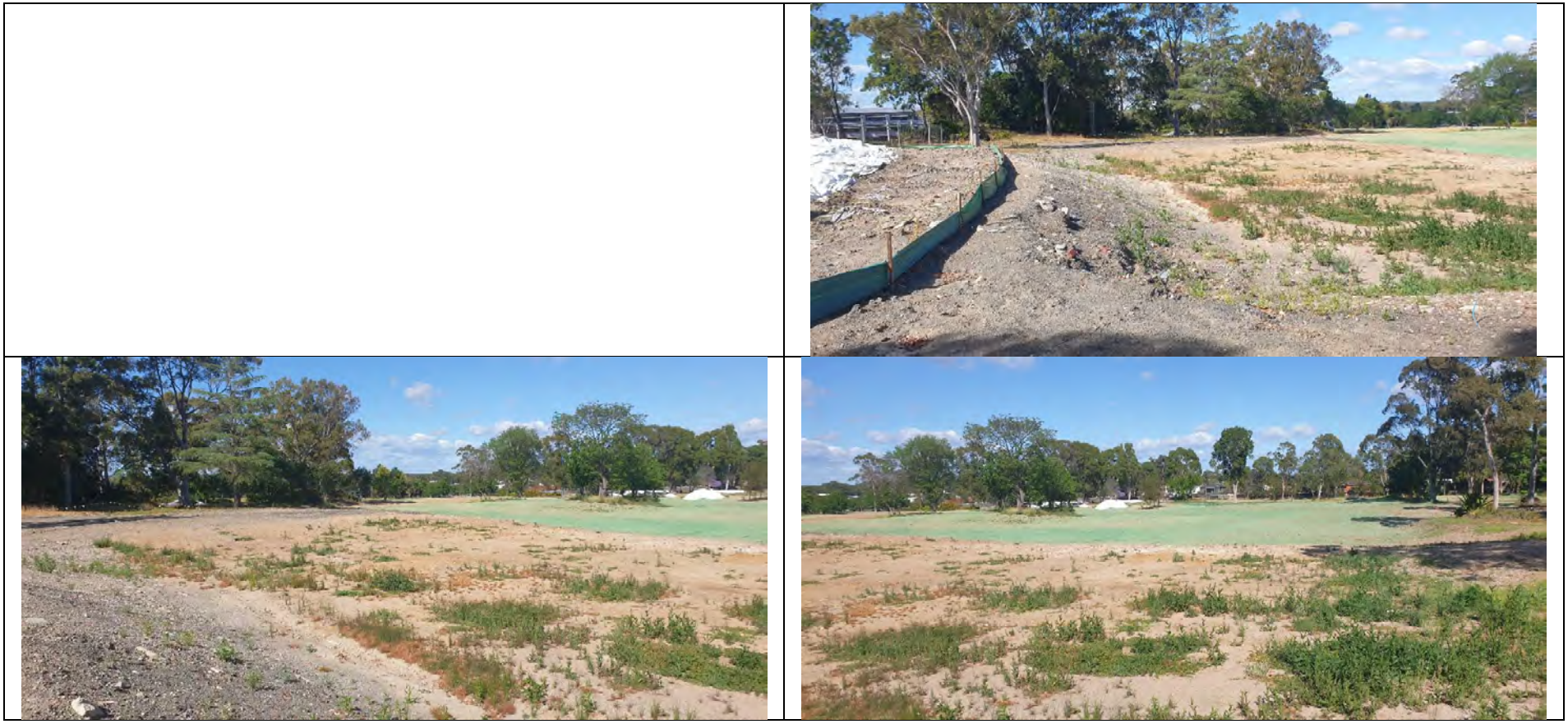


Photo 21: Cleared areas in central part of Site









Photo 22: Cleared areas in central part of Site







Photo 23: Cleared areas in central part of Site



Photo 24: Cleared areas beside former carparking area



Photo 25: Cleared areas beside former carparking area

Appendix E. Site Audit Statement & RAP

NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. **316**

This site audit is a:

☑ **statutory audit**

~~☐ non-statutory audit~~

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name **Dr Ian C Swane**

Company **Ian Swane & Associates**

Address **PO Box 359, Mortdale NSW** Postcode **2223**

Phone **0418 867 112**

Email **iswane@bigpond.com**

Site details

Address **Western Sydney University Milperra Campus, 271 Horsley Road & 2 Bullecourt Avenue, Milperra NSW (Figure 1)** Postcode **2214**

Property description

(Attach a separate list if several properties are included in the site audit.)

Lot 2 DP1291984

Local government area **City of Canterbury Bankstown**

Area of site (include units, e.g. hectares) **19.64 ha (196,400 m^2)**

Current zoning **R1 – General residential, RE1 – Public recreation, C2 – Environmental Conservation, E1 – Local Centre**

Regulation and notification

To the best of my knowledge:

☐ ~~**the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)~~

- ☐ ~~Declaration no.~~
- ☐ ~~Order no.~~
- ☐ ~~Proposal no.~~
- ☐ ~~Notice no.~~

☑ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ ~~the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*~~

☑ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name **Nibraas Ahmad, Development Manager**

Company **Mirvac Residential (NSW) Developments Pty Ltd**

Address **Level 28, 200 George Street, Sydney NSW** Postcode **2000**

Phone **(02) 88 300 400** Email **nibraas.ahmad@mirvac.com**

Contact details for contact person (if different from above)

Name **Not applicable**

Phone Email

Nature of statutory requirements (not applicable for non-statutory audits)

☐ ~~Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)~~

~~☐ Requirements imposed by an environmental planning instrument (please specify, including date of issue)~~

☑ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

To support a Development Application for a State Significant Project submitted by Mirvac to the DPHI for the proposed residential development

~~☐ Requirements under other legislation (please specify, including date of issue)~~

Purpose of site audit

~~☐ A1 To determine land use suitability~~

~~Intended uses of the land:~~

~~OR~~

~~A2 To determine land use suitability subject to compliance with either an active or passive environmental management plan~~

~~Intended uses of the land:~~

~~OR~~

(Tick all that apply)

☑ **B1 To determine the nature and extent of contamination**

☑ **B2 To determine the appropriateness of:**

~~☐ an investigation plan~~

☑ **a remediation plan**

~~☐ a management plan~~

~~☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

~~☐ **B4** To determine the compliance with an approved:~~

~~☐ **voluntary management proposal** or~~

~~☐ **management order** under the *Contaminated Land Management Act 1997*~~

☑ **B5 To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.**

Intended uses of the land: **Residential (NEPM Residential A), public parkland (NEPM Recreational C), and road corridors (NEPM Commercial / Industrial D)**

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Coffey Geotechnics, Noel Arnold & Associates, JBS&G, Alliance Geotechnical, Sydney Environmental Group (SEG), Environmental Group Australia (EGA)

Titles of reports reviewed:

1. Coffey Geotechnics (25 August 2011) '*Phase 2 Environmental Site Assessment, Student Residence Development, University of Western Sydney, Bankstown Campus".* Document No: GEOTLCOV24163AD-AB prepared for The University of Western Sydney

2. Noel Arnold & Associates (October 2011) '*Soil Contamination Investigation, University of Western Sydney – Bankstown Campus, Bullecourt Avenue, Milperra NSW*'. Document SJ0085:95458 prepared for JDH Architects

3. JBS&G (7 February 2018) '*Phase 1 Environmental Assessment Report, Bullecourt Ave, Milperra NSW*'. Document No: 54086-110124 (Rev 1) prepared for the Western Sydney University

4. Alliance Geotechnical Pty Ltd (30 January 2020) '*Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra, NSW 2214, Lot 103 DP874035'*. Document No. 9996-ER-1-1 prepared for Mirvac

5. Alliance Geotechnical Pty Ltd (15 September 2022) 'Remedial Action Plan, Western Sydney University – Milperra Campus, Horsely Rd & Bullecourt Ave, Milperra, NSW 2214'. Document No. 9996-ER-2-1_Rev03 prepared for Mirvac

6. Walkden L (27 September 2022) 'Site Audit Report, Remediation Action Plan, Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra'. Audit No: LW-030 prepared for Mirvac

7. Walkden L (27 September 2022) Section B Site Audit Statement for Western Sydney University Campus, 2 and 2A Bullecourt Avenue, Milperra. Audit No: LW-030 prepared for Mirvac

8. Sydney Environmental Group (22 February 2024) '*Supplementary Stage 2 Detailed Site Investigation, Western Sydney University, Milperra Campus, Milperra NSW*'. Document No: 2300-DSI-01-220224.v1f prepared for Mirvac Homes (NSW) Pty Ltd

9. Sydney Environmental Group (27 February 2024) '*Hazardous Building Materials Survey Report, Western Sydney University – Bankstown Campus, Milperra NSW*'. Document 2300-HBMS-071123.v2f prepared for Mirvac Pty Ltd

10. EGA (15 October 2025) '*Demolition Clearance Report – 2 Bullecourt Avenue, Milperra NSW*'. Document No: 2300-LTR-01-160725.v2f prepared for Mirvac

11. EGA (8 October 2025) '*Phase 2 Assessment – Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'. Document No: 2300-DSI-01-110325.v6f prepared for Mirvac Residential (NSW) Developments Pty Ltd

12. EGA (24 October 2025) '*Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW*'. Document No: 2300-RAP-01-300924.v41f prepared for Mirvac Residential (NSW) Developments Pty Ltd

Other information reviewed, including previous site audit reports and statements relating to the site:

50. City of Canterbury-Bankstown (2018) *'Deepwater Park and Kelso Parklands Plan of Management*'. Draft (https://www.cbcity.nsw.gov.au/planning-and-building/councils-strategies-and-masterplans/deepwater-park-and-kelso-parklands-plan-management)

51. Beveridge Williams (31 May 2024) Council DA Stamped Drawings '*WSU Milperra, Demolition DA, 2 Bullecourt Avenue, Milperra*'. Project number 2301879, Rev B, 22 sheets. Prepared for Mirvac

52. Beveridge Williams (24 July 2025) Drawing '*Master Staging Plan, WSU Milperra 2 Bullecourt Ave, Milperra, Canterbury-Bankstown Council*'. Drawing No. 2301879 302 010N prepared for Mirvac

53. City of Canterbury-Bankstown (31 May 2024) "*Notice of Determination of a Development Application, Application Number DA-1512/2023, Demolition of selected buildings and structures in four stages*". 19 pages

54. Beveridge Williams (28 August 2025) Bulk Earthworks Drawings for *"WSU Milperra, Lot 1 in DP101147 and Lot 2 in DP1291984, 2A Bullecourt Avenue, Milperra*". Dwg Nos: 2301879 320 070 C to 2301879 320 074 C

55. City of Canterbury Bankstown (22 August 2017) "*Contaminated Land Policy*"

Site audit report details

Title **Site Audit Report 316 by Dr Ian Swane, Review of ESA'S & RAP for Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW 2214**

Report no**. 316** Date **30 October 2025**

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
  - (B1) the nature and extent of contamination, and/or
  - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
  - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
  - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
  - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

~~Section A1~~

~~I certify that, in my opinion:~~

~~The **site is suitable** for the following uses:~~

~~(Tick all appropriate uses and strike out those not applicable.)~~

~~☐ Residential, including substantial vegetable garden and poultry~~

~~☐ Residential, including substantial vegetable garden, excluding poultry~~

~~☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

~~☐ Day care centre, preschool, primary school~~

~~☐ Residential with minimal opportunity for soil access, including units~~

~~☐ Secondary school~~

~~☐ Park, recreational open space, playing field~~

~~☐ Commercial/industrial~~

~~☐ Other (please specify):~~

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

OR

☐ I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.

Overall comments:

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

EMP details

Title

Author

Date No. of pages

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Section B

Purpose of the plan[4] which is the subject of this audit: **The main objectives are to:**

- **Prepare a RAP in line with the EPA guidelines for 'consultants reporting on contaminated land' in addition to local council contaminated land policy (Canterbury Bankstown 2017) to address the issues identified on the site and to provide a strategy to render the site suitable for the proposed development;**
- **Assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of ecologically sustainable development (ESD) principles;**
- **Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use;**
- **Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour and aesthetics);**
- **Ensure remediation was consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the RAP; and**
- **Provide a management framework that would give Council confidence that the remedial measures would be undertaken in accordance with the RAP, to make the site suitable for the proposed use.**

[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

I certify that, in my opinion:

(B1)

☑ **The nature and extent of the contamination has been appropriately determined**

~~☐ The nature and extent of the contamination has not been appropriately determined~~

AND~~/OR~~ **(B2)**

☑ **The** ~~investigation,~~ **remediation** ~~or management~~ **plan is appropriate for the purpose stated above**

~~☐ The investigation, remediation or management plan **is not** appropriate for the purpose stated above~~

~~AND/OR (B3)~~

~~☐ The site testing plan:~~

~~☐ **is** appropriate to determine~~

~~☐ **is not** appropriate to determine~~

~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

~~AND/OR (B4)~~

~~☐ The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):~~

~~☐ **have** been complied with~~

~~☐ **have not** been complied with.~~

~~*voluntary management proposal no.~~

~~**management order no.~~

AND~~/OR~~ **(B5)**

☑ **The site can be made suitable for the following uses:**

~~(Tick all appropriate uses and strike out those not applicable.)~~

~~☐ Residential, including substantial vegetable garden and poultry~~

~~☐ Residential, including substantial vegetable garden, excluding poultry~~

~~☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

~~☐ Day care centre, preschool, primary school~~

~~☐ Residential with minimal opportunity for soil access, including units~~

~~☐ Secondary school~~

~~☐ Park, recreational open space, playing field~~

~~☐ Commercial/industrial~~

☑ **Other (please specify): Low density residential land use, public open space and road corridors as approved by the DPHI State Significant Project approval for a Development Application to be made by Mirvac.**

IF the site is remediated~~/managed~~* in accordance with the following plan (attached):

*Strike out as appropriate

Plan title	**'*Remedial Action Plan, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW*'. Document No: 2300-RAP-01-300924.v1f prepared for Mirvac Residential (NSW) Developments Pty Ltd**
Plan author	**Environmental Group Australia (EGA)**
Plan date	**24 October 2025** No. of pages **120**

SUBJECT to compliance with the following condition(s):

1. **The remediation and validation of the Site is to be the subject of a statutory site audit, culminating in the issuing of one or more Section A SAS/SAR audit documents following the completion of remediation and validation work meeting NSW EPA and Council guidance.** ……..……..……
2. **There are data gaps in the Demolition Clearance Report (Ref [10]) that need to be addressed concerning the removal and disposal of 112 tonnes of asbestos contaminated building and demolition (B&D) waste for the period 13/05/25 to 10/07/25, and the disposal of 54 tonnes and 113 tonnes of fibrous asbestos contaminated soil reportedly excavated and disposed off-site on 4/10/24 and 13/12/24, respectively (refer Section 3.7, SAR). These data gaps need to be addressed to the satisfaction of the Site Auditor prior to the commencement of remediation work at the Site**. ……..……..
3. **Copies of the SEG (14/10/24 & 20/12/24) reports on early remediation work at fibrous asbestos hot-spots at AEC01 and AEC02 need to be provided to the Site Auditor so that the adequacy of this work and the need for additional remediation / validation work can be assessed prior to the commencement of remediation work at the Site**. ……..……..
4. **There is a risk that a significant portion of the 11,782 m^3 of stockpiled soil at the Site may be geotechnically unsuitable in its current condition for reuse as engineered fill. Such soil would need to be either processed by a power screen or similar to remove geotechnically unsuitable material after visible asbestos has been removed, or the geotechnically unsuitable soil was disposed off-site to a licensed waste facility. To address this issue, geotechnical assessments of existing stockpiled soils need to be undertaken and then a work plan prepared that documents a strategy to deal with geotechnically unsuitable asbestos contaminated fill. The work plan then needs to be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the site**. ……..…
5. **A set of geotechnical criteria need to be developed that would define those soils that could be reused on-site after asbestos had been removed, soils that could be reused after asbestos and unsuitable materials had been removed, and those soils that would need to be disposed off-site at a suitably licensed**

waste facility. The geotechnical criteria need to be developed by a competent geotechnical engineer, meet Council requirements, and be reviewed and approved by the Site Auditor prior to the commencement of remediation work at the Site. ……...

6. **No remediation work is to commence at the Site until the Site Auditor has received, reviewed and provided written approval all work plans prepared for the remediation work**. ……..……..
7. **The project environmental consultant needs to prepare remediation strategies for contamination within tree protection zones and the Northern Conservation Zone and provide them to the Site Auditor for review prior to the commencement of remediation work at the Site.** ……..….
8. **Remediation of contamination at the Site needs to be undertaken in accordance with the recommendations made by the Site Auditor in the site audit report accompanying this site audit statement.** ……..……..…….
9. **All soil stockpiled at the Site up to the date of this SAS needs to be considered as asbestos contaminated and to be remediated by either on-site treatment to remove all visible asbestos, or off-site disposal as asbestos waste to a suitably licensed landfill. No stockpiled soil is to be reused at the Site unless it has been treated and validated as containing no visible or fibrous asbestos**. ……
10. **The former southern sports field located adjacent to the Mount Saint Joseph's High School and land within 50m of the western boundary along Ashford Avenue are not to be used as an area where asbestos contaminated soil is treated or where mechanical screening is undertaken due to the risks posed by asbestos fibre and dust generation to the local community.** ……..
11. **Changes to the remediation strategy documented in the EGA (25 October 2025) RAP and the additional requirements specified by the Site Auditor in the site audit report are only to be made following written approval by the Site Auditor.**

Overall comments:

1. **This SAS should be read in conjunction with the SAR.** ……..…….

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. **9821**

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.



Signed Date **30 October 2025**

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997* (CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**: nswauditors@epa.nsw.gov.au or as specified by the EPA

  AND

- the **local council** for the land which is the subject of the audit.

Figure 1 Site Location Plan (Source: Figure 1, Ref [12])

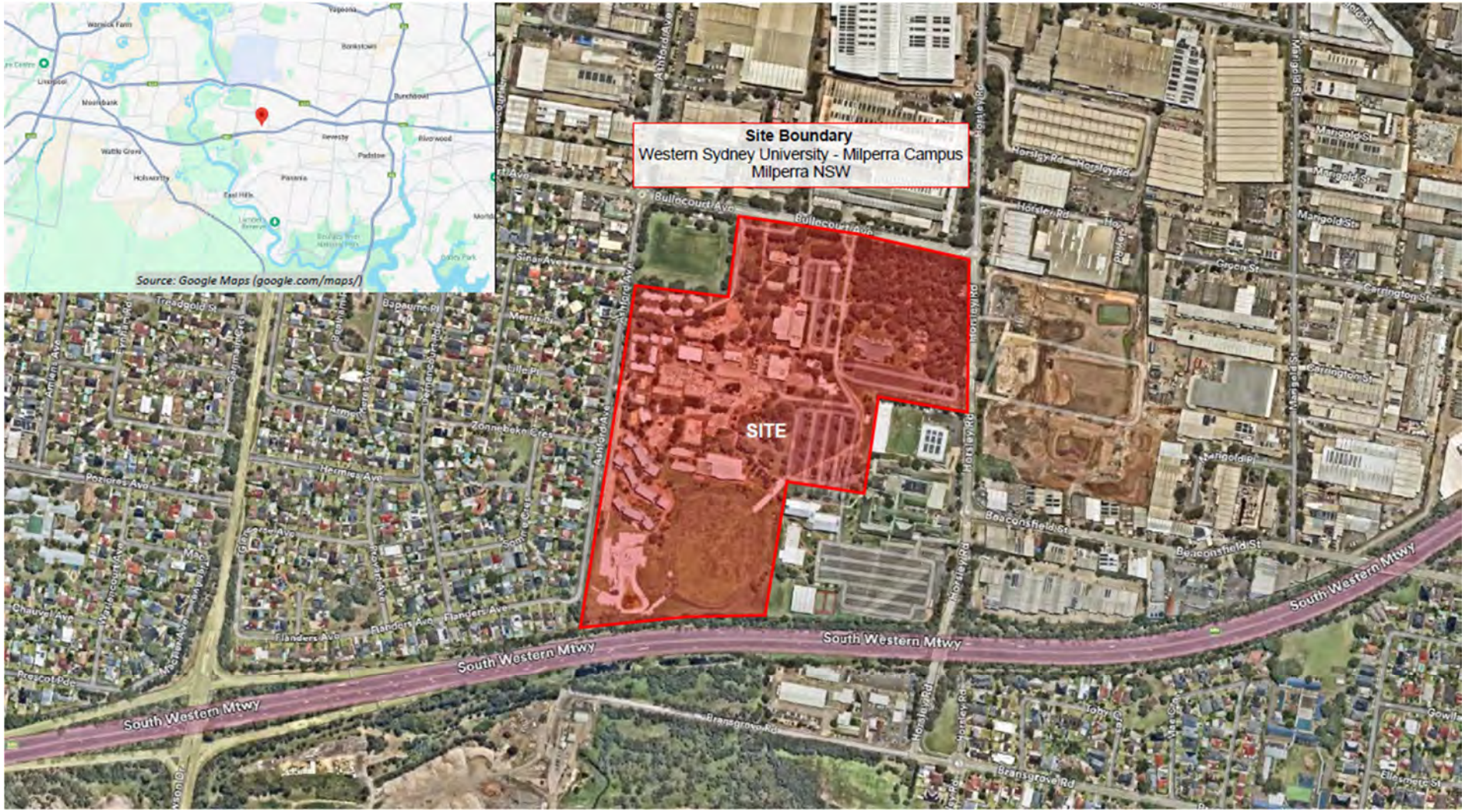


Figure 2 Proposed Layout and Staging of Residential Subdivision (Source: Ref [52])



Stage No.	No. of Superlots Lots	No. of Residential Lots	No. of Public/Drainage Reserve lots	Stage Area (m²)
Stage 1	2	22	0	8435
Stage 2	4	40	0	20526
Stage 3A & 3B	1	0	1	35408
Stage 4	8	107	2	44098
Stage 5	6	63	0	20734
Stage 6	9	92	1	35400
Stage 7	6	59	0	22247

KEY NOTES

THE DEVELOPMENT WILL BE CONSTRUCTED AND DELIVERED IN 7 DISTINCT STAGES, HOWEVER, THE SEQUENCING OF THESE STAGES IS IMMATERIAL AS THE STAGING IS INTENDED TO BE INTERCHANGEABLE, DUE TO VARYING CONSTRUCTION TIMEFRAMES AND POTENTIAL OBSTACLES ENCOUNTERED WHILST ON SITE. STAGING SEQUENCING WILL BE AS PER THE FOLLOWING:

1. STAGE 1 IS INTENDED TO COMMENCE FIRST.
2. STAGES 2 OR 3A WILL COMMENCE SECOND AND BE DELIVERED PRIOR, CONCURRENTLY OR AFTER EACH OTHER. FOR EXAMPLE, STAGE 3A CAN COMMENCE PRIOR, CONCURRENTLY OR AFTER STAGE 2 AS THEY ARE INDEPENDENT.
3. STAGE 3B CANNOT OCCUR PRIOR TO STAGE 3A, BUT DOES NOT HAVE TO BE DELIVERED BEFORE STAGES 2, 4, 5, 6 AND STAGE 7.
4. STAGE 4 CANNOT BE DELIVERED PRIOR TO STAGE 2, BUT CAN BE DELIVERED PRIOR TO STAGE 3A.
5. STAGE 5 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A AND STAGE 4.
6. STAGE 6 CANNOT BE DELIVERED PRIOR TO STAGE 2, 3A, 4 AND STAGE 5.
7. STAGE 7 CANNOT BE DELIVERED PRIOR TO STAGE 2, 4 AND STAGE 6.

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works
DIAL 1100 BEFORE YOU DIG
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Environmental Group Australia

Mirvac Residential (NSW) Developments Pty Ltd

Remedial Action Plan

Western Sydney University - Milperra Campus
Horsley Road & Bullecourt Avenue, Milperra NSW

Report No:
2300-RAP-01-300924.v1f

Report Date:
24/10/2025

Notice:

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Document Record

Revision	Date	Author	Reviewer
v1d	30 September 2024	Isabelle Figatowski	Steven Wallace
v2d	11 October 2024	Isabelle Figatowski	Steven Wallace
v3d	8 August 2025	Maxwell Cunningham	Steven Wallace
v4d	26 August 2025	Maxwell Cunningham	Steven Wallace
v5d	12 September 2025	Maxwell Cunningham	Steven Wallace
v1f	24 October 2025	Maxwell Cunningham	Steven Wallace

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Document Title:	Remediation Action Plan, Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW
Site Address:	Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW
Client Name:	Mirvac Residential (NSW) Developments Pty Ltd
Site Size:	19.4 ha
Reference Number:	2300-RAP-02-101024.v1f
Project Type:	Remedial Action Plan
Project Type Abbreviation:	RAP
Document Draft:	Final
Document Revision No.	v1f

Prepared by Environmental Group Australia Pty Ltd ABN: 83 671 599 143

Executive Summary

Environmental Group Australia (EGA) was engaged by Mirvac Residential (NSW) Developments Pty Ltd, to prepare a Remedial Action Plan (RAP) for the proposed residential development within the former Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW (refer **Figure 1**).

This RAP supersedes the existing RAP prepared for the site by Alliance Geotechnical (AG) prepared in 2022. An addendum to the AG RAP was required to reflect the contamination assessments undertaken at the site since 2022, in addition to capturing the changes to the site condition following demolition of on-site structures.

EGA has the following project appreciation:

- The entirety of the site covers an area of approximately 19.4 ha;
- The site was formerly utilised as a university campus with on-site accommodation, open space parkland, playing fields and associated infrastructure;
- The site is proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Phase 2 Environmental Site Assessment was undertaken within the student residence development area in 2011 by Coffey (Coffey 2011);
- A Soil Contamination Investigation was undertaken across the site by Noel Arnold and Associates in 2011 (NAA 2011);
- A Phase 1 Environmental Assessment Report was undertaken across the site in 2020 by JBS&G Australia (JBS&G 2020);
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four data gaps requiring further assessment;
- A Hazardous Building Material Survey was prepared for the onsite structures by EGA in 2024 which identified asbestos containing building materials, lead containing paints, SMFs, presumed PCB capacitors and ozone depleting refrigerants;
- A Phase 2 Assessment Detailed Site Investigation was completed by EGA in 2025 to address data gaps identified within AG 2022;
- The demolition of on-site structures as part of the redevelopment of site was completed across 2024 and 2025;
- A Demolition Clearance Report was prepared by EGA in 2025 documenting the removal of hazardous building materials before and during the demolition process;
- Non-friable asbestos impacted soils encountered within building footprints (AEC05) during completion of the demolition scope for site across 2024 and 2025 were partially remediated to facilitate continuation of the works in those areas. These partial remediation works generated approximately 7,626 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer;
- Non-friable asbestos impacted soils associated with AEC02 were partially excavated during construction of a sediment basin in the south of site. These partial remediation works generated approximately 4,156 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer; and
- An update to the Remedial Action Plan (RAP) is required to update and compliment the site's existing RAP (AG 2022) and address the remediation and validation of identified Areas of Environmental Concern (AEC) within the site.

The objectives of this RAP are to:

- Prepare a Remedial Action Plan (RAP) in line with the NSW EPA guidelines for 'consultants reporting on contaminated land' in addition to local council contaminated land policy (Canterbury Bankstown 2017) to address the issues that have been identified on the site and to provide a strategy to render the site suitable for the proposed development;
- Provide provision for supplementary contamination assessments to address data gaps identified in previous contamination assessments undertaken for the site;
- Achieve an acceptable outcome that is technically, logistically and financially feasible;
- Summarise the findings of site contamination investigation reports and present a refined conceptual site model;
- Document the identified contamination risks to human health and/or the environment;
- Define the extent of remediation required across the site;
- Assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of the principles of ecologically sustainable development;
- Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use;
- Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour and aesthetics);
- Address contingencies and unexpected finds protocols;
- Identify the necessary approvals and licences required by regulatory authorities including any items contained in development consent conditions;
- Clearly outline waste classification, handling and tracking requirements in accordance with the Guidelines for the NSW Site Auditor Scheme and Waste Classification Guidelines (EPA 2014);
- Ensure remediation is consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the remedial action plan;
- Identify how successful implementation of the remedial action plan will be demonstrated; and
- Provide a management framework that will give Council confidence that the remedial measures will be undertaken in accordance with the RAP, to make the site suitable for the proposed use.

The scope of the RAP has been established on the basis of findings from the previous contamination investigations completed, with the RAP aimed at providing:

- Provision to undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments;
- An appropriate remedial strategy to render the site suitable for the proposed urban residential land-use;
- Appropriate requirements for the validation and verification of the successful implementation of the remediation strategy and the remediation acceptance criteria to be adopted;
- Appropriate environmental safeguards required to conduct the remediation works in an environmentally acceptable manner; and
- OH&S procedures required to conduct the remediation works in a manner that will not pose a threat to the health of site workers or users.

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AECs) and contaminants of concern (COC) which have the potential to be present within and the site. The AECs identified are presented in attached **Figure 2** and associated contaminants of concern are presented in **Table 1.1.**

Table 1.1 Areas of Environmental Concern and Contaminants of Potential Concern

ID	Area of Environmental Concern	Contaminants of Concern	Affected mediums	Exposure risk	Proposed Remedial Strategy	Figure
AEC01	Friable Asbestos* Impacted Fill Soils	Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	3
	Non-Friable Asbestos Impacted Fill Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	3
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Lead, Cadmium and Zinc	Soil	Human Health and Ecological Health	Off-site disposal	2
AEC02	Friable Asbestos Impacted Fill Soils **	Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	4
	Non-Friable Asbestos Impacted Fill Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	4
	Stockpiled Non-Friable Asbestos Impacted Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	4
AEC03	Non-Friable Asbestos Impacted Fill Soils	Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	5
AEC05	Building Footprints (Assessed)	Asbestos	Soil	Human Health	Remediation and on-site reuse at depth	6

Notes: * Five of the six friable asbestos hotspots remediated, soils associated with sampling locations 'EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39' have been removed off-site and the excavations validated. ** Both friable asbestos hotspots remediated, soils associated with sampling locations 'EBH24' and 'EBH25' have been removed off-site and the excavations validated.

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified potential areas of environmental concern (PAECs) and contaminants of potential concern (COPC) which have the potential to be present within the broader property and the site and require further assessment. The PAECs identified are presented in attached **Figure 7** and associated contaminants of concern are presented in **Table 1.2.**

Discussion on the assessment of Potential Areas of Environmental Concern is presented in Section 8.

Table 1.2 PAECs and COPC

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk
PAEC04	Former Underground Storage or Petroleum-Based Product Onsite	Unleaded Petrol & Diesel Tanks	Heavy Metals, TRH, PAH, VOC/SVOC, Phenols	Soil & Groundwater	Human Health, Ecological Health & Aesthetics
PAEC05	Building Footprints (pending assessment)	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
	Stockpiled Non-Friable Asbestos Impacted Soils	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
PAEC06	Migration of Landfill Gas	Landfill Activities South of the Site	Methane, Carbon Dioxide, Carbon monoxide, Hydrogen sulphide	Ground Gas	Human Health
PAEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Industrial Activities North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP/OPP, PCB, PFAS, inorganic compounds	Groundwater	Human Health
PAEC08	Risk of redundant fibre cement conduits and septic tanks within the site footprint	Historical Agricultural Land-Use Activities	Metals, PAH, BTEX, TRH, Asbestos, OCPs, E.Coli and Thermotolerant Coliforms	Soil	Human Health and Ecological
PAEC09	Risk of asbestos contamination within the site footprint	Historical Agricultural Land-Use Activities	Asbestos	Soil	Human Health and Ecological

The remedial goal for this site is to remediate potential contamination (where identified) to a level that does not present an unacceptable human health exposure and environmental risks, making the suit suitable for the proposed development. EGA notes that the client, would prefer that the remedial works be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (EMP).

The extent of contamination within the site is presented within **Table 1.3** overleaf.

Table 1.3 Approximate Remedial Extents

ID	Area of Environmental Concern	Approximate Extent
AEC01	Friable Asbestos Impacted Fill Soils	25 m^2 x 0.5 m bgsl Total ≈ 12.5 m^3 / 22.5 tonnes
	Non-Friable Asbestos Impacted Fill Soils	3,950 m^2 x (0.2 to 0.7 m / average 0.5 m bgsl) 1,975 m^3 / 3,555 tonnes
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	1,000 m^2 x 0.25 m bgsl 250 m^3 / 450 tonnes *(Extent may vary following supplementary assessment)*
AEC02	Non-Friable Asbestos Impacted Fill Soils	10,425 m^2 x (0.1 to 1.2 m / average 0.5 m bgsl) 5,212.5 m^3 / 9,382.5 tonnes
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *4,156 m^3 / 7,480 tonnes*
AEC03	Non-Friable Asbestos Impacted Fill Soils	15,480 m^2 x (0.3 to 1.4 m / average 0.6 m bgsl) 9,288 m^3 / 16,718 tonnes
AEC05	Building Footprints (Assessed)	14,050 m^2 x (0.3 to 1.0 m / average 0.6 m bgsl) *8,430 m^3 / 15,174 tonnes*
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *7,626 m^3 / 13,726 tonnes*
AEC08	Risk of redundant fibre cement conduits and septic tanks within the site footprint	Site Footprint
AEC09	Risk of asbestos contamination within the site footprint	Site Footprint

Based on SE's assessment detailed above, the most suitable remedial strategy will comprise a combination of treatment options consistent the ultimate end land use of the site. **Table 1.4** below summarises the preferred remediation strategies with regards to the identified contamination within the site.

Table 1.4 Selected Remediation Strategies

AEC ID	Contamination Risk	Selected Remediation Strategy
AEC01	Friable Asbestos Impacted Fill Soils	Excavation and Off-Site Disposal
	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC02	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC03	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC05	Soil Materials Beneath Existing Building Footprints	On-Site Treatment and Beneficial Re-Use
-	Direct Contact Risks in Soil Materials (*if identified*)	Excavation and Off-Site Disposal
-	Ecological Risks in Soil Materials (only) (*if identified*)	Excavation and Beneficial Re-Use at depths > 2 m bgsl
-	Aesthetic Risks (*if identified*)	Excavation and On-Site Treatment to Remove Foreign Materials; or Off-Site Disposal

Areas subject to remediation are outlined in **Figure 2.**

Excavation and disposal off-site is considered as a contingency remedial strategy for all contamination risks.

Based on the information presented in the historical contamination assessment reports, EGA concludes that the remedial goal can be achieved, and the site made suitable for the proposed land use setting, subject to:

- Implementation of the strategies, methodologies and measures set out in this remedial action plan;
- Should newly identified unacceptable land contamination risks be identified during the supplementary assessment and remediation works, a revision to this RAP may be required. The revision should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, a waste classification for those soils should be prepared by a suitably experienced environmental consultant;
- Future remedial works should be monitored and validated by a suitably experienced environmental consultant; and
- Following the completion of the remediation and validation work, the environmental consultant needs to prepare a site remediation and validation report that documents both the remediation and validation work as required by the EPA (2020) reporting guidelines.

This report must be read in conjunction with the limitations set out in **Section 15.**

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APPENDIX A

Masterplan Civil DA Plan

List of Abbreviations

A list of the common abbreviations used throughout this report is provided below:

AHD	Australian Height Datum
AST	Aboveground storage tank
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
Btoc	Below top of casing
CoC	Chain of Custody
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
EC	Electrical conductivity
EIL	Ecological Investigation Level
EGA	Envrionmental Group Australia Pty Ltd
EPA	Environment Protection Authority
HIL	Health Investigation Levels
HSL	Health Screening Levels
LOR	[Laboratory] Limit of reporting
NATA	National Association of Testing Laboratories
N/A	Not applicable
ND	Not detected
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	NSW Environment Protection Authority
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photo-ionisation detector
PSI	Preliminary Site Investigation
QA/QC	Quality assurance/Quality control
RPD	Relative percentage difference
SAQP	Sampling Analysis and Quality Plan
SVOC	Semi-volatile organic compound
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UST	Underground storage tank

1 INTRODUCTION

1.1 Background

Environmental Group Australia (EGA) was engaged by Mirvac Residential (NSW) Developments Pty Ltd, to prepare a Remedial Action Plan (RAP) for the proposed residential development within the former Western Sydney University – Milperra Campus, Horsley Road & Bullecourt Avenue, Milperra NSW (refer **Figure 1**).

This RAP supersedes the existing RAP prepared for the site by Alliance Geotechnical (AG) prepared in 2022. An addendum to the AG RAP was required to reflect the contamination assessments undertaken at the site since 2022, in addition to capturing the changes to the site condition following demolition of on-site structures.

EGA has the following project appreciation:

- The entirety of the site covers an area of approximately 19.4 ha;
- The site was formerly utilised as a university campus with on-site accommodation, open space parkland, playing fields and associated infrastructure;
- The site is proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Phase 2 Environmental Site Assessment was undertaken within the student residence development area in 2011 by Coffey (Coffey 2011);
- A Soil Contamination Investigation was undertaken across the site by Noel Arnold and Associates in 2011 (NAA 2011);
- A Phase 1 Environmental Assessment Report was undertaken across the site in 2020 by JBS&G Australia (JBS&G 2020);
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four data gaps requiring further assessment;
- A hazardous Building Material Survey was prepared for the onsite structures by EGA in 2024 which identified asbestos containing building materials, lead containing paints, SMFs, presumed PCB capacitors and ozone depleting refrigerants;
- A Phase 2 Assessment Detailed Site Investigation was completed by EGA in 2025 to address data gaps identified within AG 2022;
- The demolition of on-site structures as part of the redevelopment of site was completed across 2024 and 2025;
- A Demolition Clearance Report was prepared by EGA in 2025 documenting the removal of hazardous building materials during the demolition process;
- Non-friable asbestos impacted soils encountered within building footprints (AEC05) during completion of the demolition scope for site across 2024 and 2025 were partially remediated to facilitate continuation of the works in those areas. These partial remediation works generated approximately 7,626 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer;
- Non-friable asbestos impacted soils associated with AEC02 were partially excavated during construction of a sediment basin in the south of site. These partial remediation works generated approximately 4,156 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer; and
- An update to the Remedial Action Plan (RAP) is required to update and compliment the site's existing RAP (AG 2022) and address the remediation and validation of identified Areas of Environmental Concern (AEC) within the site.

1.2 Proposed Development

EGA understands that the proposed development within the site will comprise construction of residential housing and associated infrastructure within a low-density residential land use setting. The proposed development will entail subdivision of the site into up to 430 residential lots, approximately 2 ha of conservation land in the north-east corner of site and three open space areas / public parks.

Residential lots will be sold off under Torrens tittle. The road corridors and parkland areas will be acquired by local council. The conversation area will be maintained through a community title scheme applicable to both E1 and C2 areas.

Table 1.2.1 Proposed Development Stages

Development Stage	Parks/ Conservation Area	Construction Timeframe
1	No	Q3 2026 to Q4 2026
2	Central park	Q3 2026 to Q1 2027
3	C2 Conservation Area	Q2 2027 to Q3 2027
4	Southern Park	Q2 2027 to Q2 2028
5	No	Q2 2028 to Q4 2028
6	Northern park	Q3 2028 to Q1 2029
7	No	Q1 2029 to Q3 2029

The proposed bulk earthworks plan for the site comprises approximately 55,502 m^3 of cut and 60,584 m^3 of fill (refer to Masterplan Civil DA Plas appendix A).

Currently under the *State Environmental Planning Policy (Resilience and Hazards 2021)* – a consent authority must not consent to the carrying out of any redevelopment unless it has considered whether the land is contaminated.

1.3 Objectives

The objectives of this RAP are to:

- Prepare a Remedial Action Plan (RAP) in line with the NSW EPA guidelines for 'consultants reporting on contaminated land' in addition to local council contaminated land policy (Canterbury Bankstown 2017) to address the issues that have been identified on the site and to provide a strategy to render the site suitable for the proposed development;
- Provide provision for supplementary contamination assessments to address data gaps identified in previous contamination assessments undertaken for the site;
- Achieve an acceptable outcome that is technically, logistically and financially feasible;
- Summarise the findings of site contamination investigation reports and present a refined conceptual site model;
- Document the identified contamination risks to human health and/or the environment;
- Define the extent of remediation required across the site;
- Assess options and remedial technologies to achieve the remediation objectives and select and justify a preferred approach, which must include the consideration of the principles of ecologically sustainable development;
- Document in detail all procedures and plans to reduce risks posed by contamination to acceptable levels for the proposed site use;
- Establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner, including consideration of the potential for off-site impacts (such as air quality, odour and aesthetics);
- Address contingencies and unexpected finds protocols;
- Identify the necessary approvals and licences required by regulatory authorities including any items contained in development consent conditions;

- Clearly outline waste classification, handling and tracking requirements in accordance with the Guidelines for the NSW Site Auditor Scheme and Waste Classification Guidelines (EPA 2014);
- Ensure remediation is consistent with relevant laws, policies (including planning instruments and policies) and guidelines and reference these in the remedial action plan;
- Identify how successful implementation of the remedial action plan will be demonstrated; and
- Provide a management framework that will give Council confidence that the remedial measures will be undertaken in accordance with the RAP, to make the site suitable for the proposed use.

1.4 Scope of Remedial Action Plan

The scope of the RAP has been established on the basis of findings from the previous contamination investigations completed, with the RAP aimed at providing:

- Provision to undertake a supplementary contamination assessment to address data gaps identified in previous contamination assessments;
- An appropriate remedial strategy to render the site suitable for the proposed urban residential land-use;
- Appropriate requirements for the validation and verification of the successful implementation of the remediation strategy and the remediation acceptance criteria to be adopted;
- Appropriate environmental safeguards required to conduct the remediation works in an environmentally acceptable manner; and
- OH&S procedures required to conduct the remediation works in a manner that will not pose a threat to the health of site workers or users.

1.5 Roles and Responsibilities

The main parties involved in carrying out the remediation works at the site are the Project Manager, Remediation Contractor and the Environmental Consultant. A table of role and responsibilities of all parties has been outlined below in **Table 1.5.1** overleaf.

Council's Contaminated Land Policy requires that "Prior to determining development applications, Council must be satisfied that remedial measures have been, or will be, undertaken in accordance with the submitted RAP, to make the site suitable for the proposed use." This RAP achieves this objective by specifying a management framework that aims to achieve this objective.

The adopted management framework for this RAP involves:

- All remediation work at the Site needs to be undertaken in accordance with the RAP and any interim audit advice approved by Council and referenced in a Development Application;
- Any changes to the remediation strategy are to be approved in writing by the Site Auditor and Council prior to the change being implemented; and
- A generic task breakdown structure has been designed with hold points at the end of critical tasks.

Table 1.5.1 Roles and Responsibilities for the Remediation Works

Roles	Responsibility
Property Owner or Site Developer	• Overall responsibility of site and key liaison for council. Appoints appropriate site contractors, including all other members of the Remediation Works Team.
Project Manager	• Responsible for overseeing the implementation of the RAP.
Remediation Contractor	• Responsible for conducting the remediation works and managing the site in accordance with the requirements of the RAP and associated Development Consent. • Site Preparation including establishment of management plan requirements, importation of suitable landscaping material (if required) waste classification and disposal, as well as ensuring the remediation is conducted in accordance with this plan. • Ensure consultant is up to date with work schedules and is engaged to complete key components of the work (i.e. waste classification assessments, etc) • Implementation of measures required to mitigate any adverse effects resulting from the remediation • Ensure all spoil removed from site is classified by the environmental consultant and is disposed of at a suitable facility • Tracking of waste between the site and deposition facility, including collection of all waste documentation to be provided to the environmental consultant. • Reporting any environmental issues, complaints or unexpected finds to the project manager and environmental consultant
Environmental Consultant	• Development of the remediation objectives and strategy • Support all other members of the Remediation Works Team in understanding the requirements of the RAP and the potential risk posed should measures not be implemented • Updating all other members of the Remediation Works Team following receipt of results from the supplementary contamination assessment • Monitoring of key remediation components, collection of all environmental samples, and provide guidance to ensure the remediation is understood, and effective • Complete site validation tasks and detail the works in a validation report concluding on site suitability
Canterbury Bankstown	• Responsible for granting all consents and ensuring the recommendations of environmental reports are implemented
Site Auditor	Responsibilities for addressing the following scope: • Has the contaminated land consultant complied with all EPA endorsed guidelines • What further investigations or remediation is required before the land is suitable for any specified use or range of uses? • Whether the auditor considers that the proposed remediation is adequate, and if undertaken, will render the site to be suitable for the proposed use

2 SITE IDENTIFICATION

The site identification details and associated information are presented in **Table 2.1.**

Table 2.1 Site Identification Information

Attribute	Description
Street Address	Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW
Lot and Deposited Plan (DP)	Lot 2 DP1291984 Lot 1 DP101147
Geographical Coordinates	33°56'25.876" S 150°59'26.563" E (Centre of site)
Site Area	19.4 ha
Local Government Area (LGA)	City of Canterbury-Bankstown
Parish	Bankstown
County	Cumberland
Zoning	SP2 - Infrastructure / Commercial Servies (Educational Establishment) RE1 - Public Recreation R1 - General Residential C2 - Environmental Conservation E1 - Local Centre *Canterbury-Bankstown Local Environmental Plan 2023*

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

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

3 GEOLOGY, ACID SULFATE SOILS, TOPOGRAPHY AND HYDROGEOLOGY

Regional geology, topography, soil landscape and hydrogeological information are presented in **Table 3.1**.

Table 3.1 Regional Setting Information

Attribute	Description
Geology	A review of the Environment NSW 'eSpade V2.1' web application (environment.nsw.gov.au/eSpade2WebApp, accessed 30 September 2024), indicated that the site is likely to be underlain by Wianamatta Group Ashfield Shale defined as laminite and dark grey siltstone, Bringelly Shale defined as shale with occasional calcareous claystone, laminite and infrequent coal, and Minchinbury Sandstone defined as fine to medium-grained quartz lithic sandstone.
Acid Sulfate Soils	A review of the acid sulfate soil risk mapping layer accessed on the Environment NSW 'eSpade V2.1' web application (accessed 30 September 2024), indicated that the site lies in an area mapped as ***'No Known Occurrence'*** with respect to acid sulfate soils. This infers that land management activities are not likely to be affected by acid sulfate soil materials. Further assessment of acid sulfate soils in the context of this investigation is considered by EGA as not warranted.
Topography	Generally, the local landscape consists of gently undulating rises on Wianamatta Group Shale with local relief 10 – 30 m and slopes generally >5% but occasionally up to 10%. The site topography slopes downwards from the north-east to south-west corner. EGA understands that the site is located at an elevation approximately 3 m to 22 m Australian Height Datum (AHD).
Hydrology and Hydrogeology	Surface water courses proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site. Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the subject area within the site is considered likely to be towards the south-west. A review of the NSW Office of Water groundwater database undertaken on 30 September 2024 indicated there are 7 registered groundwater features located within a 500 m radius of the north-eastern portion of the site; • GW113993 – groundwater monitoring bore, final drill depth 4.00 metres below ground level (mBGL), standing water level (SWL) not specified, located approximately 105 m east of the site; • GW113998 – groundwater monitoring bore, final drill depth 4.50 mBGL, SWL not specified, located approximately 150 m east of the site; • GW113994 – groundwater monitoring bore, final drill depth 5.20 mBGL, SWL not specified, located approximately 145 m east of the site; • GW113997 – groundwater monitoring bore, final drill depth 12.50 mBGL, SWL not specified, located approximately 240 m east of the site; • GW113999 – groundwater monitoring bore, final drill depth 7.00 mBGL, SWL not specified, located approximately 250 m east of the site; • GW113995 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 278 m east of the site; and • GW113996 – groundwater monitoring bore, final drill depth 4.00 mBGL, SWL not specified, located approximately 307 m east of the site.
Adjacent Sensitive Receptors	A review of the Bureau of Meteorology Groundwater Dependent Ecosystem Map was undertaken to determine the closest sensitive ecological receptors. The closest highly dependent groundwater ecosystem was the Georges River, located approximately 1.3 km south-west of the site. The closest sensitive human receptors are the residential properties surrounding the site's boundary and any future onsite construction workers / builders.

4 PREVIOUS CONTAMINATION ASSESSMENTS

The following reports were reviewed during the project:

- Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;
- Noel Arnold and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;
- Environmental Investigation Services (EIS 2016), 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016, no report ref provided;
- JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;
- Alliance Geotechnical (AG 2020), 'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;
- Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1;
- Environmental Group Australia (2025), 'Phase 2 Assessment Detailed Site Investigation, Western Sydney University – Milperra Campus, Milperra NSW', dated 26 August 2025, Ref: 2300-DSI-01-220224.v5f;
- Sydney Environmental Group (2023), 'Hazardous Building Material Survey, Western Sydney University – Milperra Campus, Milperra NSW', dated 27 February 2024, Ref: 2300-HBMS-01-081123.v1f; and
- Sydney Environmental Group (2025), 'Demolition Clearance Report, 2 Bullecourt Avenue, Milperra NSW', dated 15 October 2025, Ref: 2300-LTR-05-160725.v2f;

A summary of the previous contamination assessments is provided in **Sections 2** to **4.9.**

EGA notes that the site investigations were prepared in accordance with the hazardous and Resilience SEPP and reported in accordance with the NSW EPA (2020) Guidelines on 'Consultants Reporting on Contaminated Land'. As part of the Site Audit Statement issued for the previously prepared Remediation Action Plan (AG 2022), in which the previously prepared contamination reporting above is summarised, NSW site Auditor Louise Walkden stated that '*In the Auditors opinion, the nature and extent of contamination has been sufficiently determined for remediation planning purposes, noting data gaps can be adequately addressed under the RAP framework.*'

The assessment of fill materials within the site, with the exception of previously inaccessible areas beneath hardstand and structures is considered complete. Further characterisation of the lateral extent and nature of the identified asbestos impacts was outlined in the AG 2022 RAP to aid and inform remediation.

These characterisation works were undertaken across 2024 by SEG and 2025 by EGA, which are reported in the 2025 EGA Phase 2 Assessment DSI. Some portions of site remained inaccessible or where unable to be sampled at the time of that assessment. These data gap areas have been outlined within this RAP (refer to **Table 8.2** and **Figure 7**).

4.1 Phase 2 Environmental Site Assessment (Coffey 2011)

For the purposes of the Phase 2 Environmental Site Assessment (P2 ESA), Coffey assumed the assessment boundary comprised approximately 1.5 ha. At the time of reporting, it was subsequently understood that the proposed student residence development was to extend further to the east and cover an area of approximately 3 ha.

Coffey understood that UWS required a P2 ESA to support a development application (DA) to Bankstown City Council.

The objectives of the assessment were to:

- Assess the acid sulfate soil status of the site based on a review of risk map and field observations;
- Assess the contamination status of the site by undertaking sampling and testing of soil; and
- Provide recommendations for further investigation/remediation requirements (if any) for the site to be suitable for the proposed student accommodation development.

The scope of work undertaken included:

- Fieldwork including soil sampling;
- Laboratory testing; and
- Data assessment and reporting.

Based on the site history information and visual observations, a number of Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs) were identified. The identified AECs and associated CoPCs identified by Coffey 2021 are presented in Table 4.1.1 below.

Table 4.1.1 AECs and associated COPC

Potential Areas of Concern	Chemicals of Potential Concern	Extent of Contamination
Southern end of the site – building rubble burial	TPH, PAH, Metals, Asbestos	Building rubble was buried up to 3 m to 4 m below the site surface.
Former farm dam – potential contaminated fill	TPH, BTEX, PAH, OCP, Metals, Asbestos	Potentially contaminated fill could have been used to backfill the dam
Whole site – use of pesticides for pest/weed control	OCP, Metals	Chemical application (such as pesticides) was commonly used in historical farming activities. Contamination, if present, is likely to be localised near the surface and minor.
Whole site – hazardous building materials	Asbestos, Lead	Historical fam sheds/houses could contain asbestos and lead paint. Weathering, leaching and spreading (during demolition) of material would likely to be localised in the near surface.
Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

Twenty-five boreholes were cored across the site on 11 and 12 July 2011, and samples submitted to a NATA accredited laboratory for analysis of CoPC.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- Asbestos, which was detected at six locations across the site.

Coffey recommended additional assessment to be undertaken to further characterise the asbestos impact and to assist in the selection of remedial and management options.

4.2 Soil Contamination Investigation (NAA 2011)

NAA was commissioned by JDH Architects to undertake a Soil Contamination Investigation (SCI) in an area in the northeast of the Bankstown Campus at the University of Western Sydney - Bankstown Campus located at Bullecourt Avenue, Milperra NSW. The portion of the site investigated in NAA (2011) was approximately 2,500 m^2 in area and resided to the north of the existing P2 car park at the Bankstown Campus. The proposed redevelopment comprised construction of a single storey childcare facility with adjacent car parking facilities.

The objectives of the SCI were to provide information on the extent and nature of contamination (if any) within the fill/soil material at the site and to assess the suitability of the site for the proposed land-use as a childcare facility.

NAA undertook the following scope of works to achieve the project objectives:

- Prepare a safe work method statement for works to be conducted at the site;
- Complete a site inspection and a comprehensive site walkover;
- Conduct grid-based sampling pattern by the hand augering of eight locations within the boundaries of the site. Hand augering was undertaken to a maximum depth of approximately 1.2 m below ground surface with sampling conducted at varying depths through the fill/soil profile;
- Collect 17 soil samples;
- Conduct NATA-certified laboratory-based analysis of soil; and
- Prepare a SCI report.

Based on the findings of the investigation, NAA concluded the following:

- Hotspots of lead contamination at locations BH3 0.0-0.2 m and S2 0.0-0.1 m were identified during an intrusive investigation previously undertaken by Coffey (AG was not provided this report);
- Concentrations of cadmium (BH3 0.0-0.2 m) and zinc (BH3 0.0-0.2 m, S2 0.0-0.1 m and S7 0.0-0.1 m) have been found to exceed the adopted Provisional Phytotoxicity Investigation Levels (PPIL);
- The site was unsuitable for the proposed land use as a childcare facility due to the presence of hotspots of lead contamination which may present a risk to human health if not appropriately managed;
- Exceedances of PPILs have also been reported at these locations and can be addressed as part of the management of the lead hotspots; and
- A marginal exceedance of zinc concentrations when compared with the PPIL was recorded at S7 0.0-0.1 m. Given the marginal nature of this exceedance, it does not impact upon the suitability of the site for the proposal land use as a childcare facility.

Based on these conclusions, NAA 2011 made the following recommendations:

- Given the shallow nature of the impacted material, it was assumed that this material will be excavated and removed from site during the course of site preparation works (e.g. stripping back of topsoil material) for the purposes of redevelopment;
- Fill/soils to be removed offsite for disposal should be classified in accordance with NSW EPA Waste Classification Guidelines (2014) and should be disposed of at an appropriately licenced landfill facility;
- Following site preparation works, a suitably qualified and experienced Environmental Consultant should return to site to collect validation samples of the area of concern (in vicinity of BH3, S2 and S7) in order to confirm acceptable residual concentrations of heavy metals are present with respect to the adopted HIL and PPIL and that the site is suitable for the intended land use; and

- If it is determined that site preparation works will not result in the excavation and removal of the shallow material at BH3 0.0-0.2 m and S2 0.0-0.1 m, remediation works will be required. In this event, it is recommended that a Remedial Action Plan (RAP) be developed to address remediation of the hotspots of contamination identified.

4.3 Preliminary Contamination Screening and Waste Classification (EIS 2016)

Burtenshaw Scoufis Architecture + Interiors commissioned Environmental Investigation Services (EIS) to assign a waste classification to in-situ soil adjacent to the west of the athletics track located at 2 Bullecourt Avenue, Milperra NSW.

The aim of the investigation was to assess soil contamination issues at the site and to provide a waste classification for the material to be excavated for the proposed oval development.

The scope of work included the following:

- Review of available geological information;
- Soil sampling from three boreholes;
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC); and
- Preparation of a letter report presenting the results of the investigation.

All results were below the site assessment criteria (SAC) adopted for the site. Overlying fill soils were classified as General Solid Waste (Non-putrescible) and underlying natural soils were classified as Virgin Excavated Natural Material (VENM). Based on this data, EIS concluded that the risk of widespread significant soil contamination in the development area was relatively low. The fill and natural soil material assessed was considered by EIS to be suitable for re-use on the subject site, provided it meets geotechnical and earthwork requirements.

4.4 Phase 1 Environmental Assessment Report (JBS&G 2018)

JBS&G Australia Pty Ltd (JBS&G) was engaged by Western Sydney University (WSU) to prepare a Phase 1 Environmental Assessment Report for the WSU Milperra Campus located off Bullecourt Avenue, Milperra NSW. Based on current Master Plan concepts for the Milperra Campus, JBS&G understood WSU intended to create an integrated living and working precinct with a range of land uses including medium to high density residential, mixed use, retail, community, open space and conservation areas at the site.

The objective of the investigation was to assess the potential for contamination relating to historical and current land use activities at the site to constrain the intended development objectives, and to make recommendations for further investigations and or remediation to achieve intended land uses of the development.

To meet the project objectives, JBS&G carried out the following scope of works:

- Review of available council documentation, aerial photographs, legal title information, EPA records and heritage records to identify areas of environmental concern (AECs) and associated contaminants of potential concern (CoPC);
- Review of site setting including topography, hydrology, hydrogeology and geology;
- Review of records of environmental incidents or former environmental licenses held by the NSW EPA;
- A detailed site inspection of accessible areas to identify potential AECs and CoPC not identified in the historical record review;
- Development and documentation of a conceptual site model (CSM);
- Limited soil sampling and analysis of soil samples for a range of CoPC;
- Assessment of soil sampling and analysis results against EPA endorsed guideline criteria for residential land use; and
- Preparation of the Phase 1 Environmental Site Assessment report in general accordance with guidelines made or approved by the NSW EPA.

Surrounding land use at the time of JBS&Gs site walk over was comprised of the following:

- North: Bullecourt Avenue with commercial / industrial land-use beyond including a service station to the north-west;
- East: Mount Saint Joseph's High School and Horsley Road with commercial / industrial land-use beyond;
- South: The South Western Motorway (M5) with Kelso Landfill beyond; and
- West: Ashford Avenue with residential land-use beyond.

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested. Information provided by SafeWork NSW included details on a number of abandoned (2) underground storage tanks (USTs) formerly located in the central western section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500 L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

Based on site history review and observations during the site walkover, JBS&G identified the following AEC and associated CoPC presented in **Table 4.4.1** below.

Table 4.4.1 AECs and associated COPCs

Areas of Environmental Concern (AECs)	Contaminants of Potential Concern (CoPCs)
Demolition of historical site structure that may have contained hazardous building materials	Heavy metals, lead and asbestos
Surface soils impacted with herbicides/pesticides due to the maintenance of site from noxious weeds/pests	OCPs
Fill materials across the site, potential imported to site	Heavy metals, TRH, BTEX, PAH, OCPs, PCBs and asbestos
Burial area (fill material)	Heavy metals, TRH, BTEX, PAH, VOCs
Landfill gas along the southern boundary adjacent the Kelso Landfill	Methane and other landfill gases (LFG)

JBS&G presented the following outcomes of its phase 1 assessment.

Based on the unidentified sources of fill material potentially imported to the site to backfill/raise topographic features and the potential for fill material at the site to contain waste materials associated with demolition of historical buildings potentially containing asbestos and/or lead paint, fill materials must be considered a potential contaminated medium. Due to the age of some existing site structures, it is possible that they may contain hazardous building materials including asbestos and lead based paints. Soils immediately surrounding buildings are considered as potentially contaminated medium.

In addition, buildings containing asbestos and / or lead paint which may have been demolished without appropriate controls may have also impacted surface soils. Surface soils must also therefore be considered a potential contaminated medium.

Based on the suspected depth of groundwater > 8 m bgs, the likelihood of contamination of groundwater as a result of activities at the site is considered to be low. Based on the presence of the landfill site to the south and the nearby commercial/industrial properties to the north and east, there is potential for groundwater to be impacted as a result of offsite activities.

Given the relatively close proximity of the landfill to the south of the site, landfill gas has the potential to be a contaminated medium in the southern portion of the site.

JBS&G carried out a limited detailed site inspection and investigation. During the detailed site inspection JBS&G noted the observation of topography for potential adjustments in ground levels due to filling, presence of waste material such as asbestos containing material (ACM) on the ground surface and on external surfaces of structures and potential chemical/fuel storage, use or spillage.

On 23 August 2017, ten surface samples were collected from the site using a hand auger and forwarded to a NATA accredited laboratory for analysis of heavy metals, PAH, asbestos (NEPM 500 ml) and OCPs. During soil sampling, a geotechnical fabric layer was identified below the ground surface at sampling point SS10.

Analytical results indicated the contaminant concentrations were less than the adopted site criteria, with the exception of:

- SS10 – asbestos fibres/fibrous asbestos (AF/FA) detected at 0.02% w/w above the adopted HSL site criteria 0.001% w/w.

Based on the findings of this investigation, JBS&G made the following conclusions:

- The site has historically been used for a combination of agricultural and residential uses prior to development of the university;
- There is the potential for impacts to soil as a result of the demolition of former building structures potentially containing hazardous building materials, including asbestos and lead paint. This was confirmed by the identification of asbestos at sampling point SS10 and review of the Coffey 2011 Phase 2 Environmental Site Assessment Report, which also identified and recommended management of asbestos in soil;
- There is the potential for presence of imported fill material of unknown origin to have been used during historical construction activities at the site; and
- Based on the presence of the landfill site to the south and the nearby commercial industrial properties to the north, northwest and east, there is considered to be a potential for contaminated groundwater and landfill gas migration to have impacted the site.

Based on these conclusions, JBS&G recommended a detailed site investigation (DSI) is undertaken for the site in order to assess the extent and degree of contamination at the site and to provide an assessment of risk posed by site contaminants to human and environmental health. In addition to the DSI, JBS&G recommended a hazardous building material survey be completed prior to commencement of redevelopment works such that materials identified as comprising lead paint and or asbestos may be appropriately managed with regard to exposure risks to site workers and future building occupants.

4.5 Detailed Site Investigation (AG 2020)

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Residential (NSW) Developments Pty Ltd to conduct a Stage 2 Detailed Site Investigation (DSI) for the site located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The site was proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- A Detailed Site Investigation was required to accompany the development application.

The primary objectives of this investigation were;

- To assess the potential for contamination to be present on the site in available accessible areas as a result of past and current land use activities;

- To provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- To provide recommendations for further investigation, management and/or remediation (if warranted).

AG undertook the following activities to address the project objectives:

- A desktop review of relevant information pertaining to the site;
- A site walkover to understand current site conditions;
- Conduct an intrusive site investigation via hydraulic excavator, drill rig and hand auger to establish ground conditions, facilitate the collection of representative soil and groundwater samples and install groundwater monitoring wells;
- Laboratory analysis of selected soil and groundwater samples collected during the field investigation; and
- An assessment of the contamination status of the site and preparation of a DSI in accordance with the Guidelines for Consultants Reporting on Contaminated Sites, 2011.

Based on evidence assessed as part of the investigation, AG made the following conclusions;

- The detected concentrations of contaminants of potential concern in groundwater are considered unlikely to present a risk to surrounding aquatic environments;
- The detected concentrations of contaminants of potential concern in groundwater are considered unsuitable for discharge to municipal stormwater without further treatment / assessment;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of asbestos fines / friable asbestos and non-friable asbestos containing materials in the soil samples analysed are considered likely to present a risk an unacceptable direct contact human health exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable inhalation / vapour intrusion exposure risk;
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable TPH management limit exposure risk; and
- The detected concentrations of contaminants of potential concern in the soil samples analysed are considered unlikely to present a risk an unacceptable aesthetic risk.

The following areas of environmental concern were identified:

Table 4.5.1 Areas of Environmental Concern (AG 2020)

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Friable / Non-Friable Asbestos and Heavy Metal impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos, Lead, Cadmium and Zinc
AEC02	Friable Asbestos impacted Fill Soils	Uncontrolled Filling	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	Uncontrolled Filling	Asbestos

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC04	Potential Underground Storage of Petroleum Products Onsite (JBS&G 2018)	Uncontrolled Fuel / Oil Spillage	Metals, PAH, BTEX and TRH
AEC05	Existing Building Footprints (inaccessible)	Uncontrolled Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos

Based upon conclusions made, AG recommended the following;

- A further supplementary contamination assessment should be considered to further understanding of nature and extent of contamination identified onsite and address data gaps presented by building footprints, inaccessible areas and building footprints;
- Preparation of a Remedial Action Plan (RAP) is required to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination risk;
- If groundwater is expected to be encountered during the proposed development, a groundwater management plan would be required;
- The preparation of any supplementary contamination assessments, remedial action plans and/or groundwater management plans should be completed by an appropriately experienced environmental consultant;
- As per NSW WHS Regulations, any removal of friable asbestos requires the engagement of a Class A licensed asbestos removalist and a pre-notification to SafeWork NSW, with accompanying air monitoring during the works and clearances post completion to be conducted by a licensed asbestos assessor (LAA);
- Following remediation of the identified contamination, validation sampling and a site validation report will be required to confirm the effectiveness of the remedial works; and
- Any soil proposed for disposal should be classified and disposed of as per the NSW EPA Waste Classification Guidelines, 2014 with all disposal documentation retained by the client for inclusion within the site validation report.

4.6 Remedial Action Plan (AG 2022)

Alliance Geotechnical Pty Ltd (AG) was engaged by Mirvac Residential (NSW) Developments Pty Ltd to prepare a Remedial Action Plan (RAP) for the site located at Western Sydney University – Milperra Campus, Milperra NSW.

AG had the following project appreciation:

- The site was an active campus of Western Sydney University;
- The investigation was limited to areas outside of building structures and discretion was required in active areas of the site;
- The property was understood to be proposed for rezoning and subdivision to facilitate residential development. It was understood that this will comprise demolition of the existing university campus and construction of a low-density residential development; and
- A Detailed Site Investigation (DSI) was carried out for the site by AG in 2020, which recommended a supplementary contamination assessment to understand the nature and extent of contamination identified onsite and address data gaps presented by building footprints, previous contamination assessments and inaccessible areas of environmental concern; and
- The DSI also concluded that a RAP be prepared in order to detail the works needed to adequately delineate, remediate and validate the areas of concern that present an unacceptable contamination assessment.

The following Sampling Analysis Quality Plan (SAQP) was prepared for the data gap assessment required prior to remediation works.

Table 4.6.1 Data Gap Assessment SAQP (AG 2022)

ID	Area of Environmental Concern	Area (m^2)	Methodology	Analytes
Detailed Asbestos Gravimetric Assessment				
AEC01	Friable / Non-Friable Asbestos impacted Surficial and Fill Soils	12,800	Forty-six (46) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC02	Friable Asbestos impacted Fill Soils	17,100	Fifty-four (54) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
AEC03	Non-Friable Asbestos impacted Surficial and Fill Soils	18,240	Eighty-four (84) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Remaining areas of site	Potential Asbestos impacted Soils	80,000	Forty-seven (47) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Asbestos
Heavy Metal / Asbestos Gravimetric Assessment				
AEC01a	Heavy Metal impacted Surficial and Fill Soils	1,000	Six (6) sampling points, 10 L sample required every 1 m from surface, 500 ml sub-sample for quantitative asbestos analysis.	Lead, Cadmium, Zinc and Asbestos
Chemical Characterisation / Asbestos Gravimetric Assessment				
AEC05	Post Demolition Assessment	37,000		

Based on the data reviewed during the preparation of the RAP, AG concluded the land could be made suitable for the proposed future land use subject to completion of the following;

- Preparation of a SAQP prior to commencement of data gap assessment;
- Implementation of the strategies, methodologies and measures set out in this RAP;
- Should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, waste classification for those soils should be prepared by a suitably experienced environmental consultant. Residual impacted fill materials must also be appropriately characterised as per the strategy outlined in this RAP;
- AG recommended that any waste classifications, remediation monitoring and validation works be undertaken by a suitably experienced environmental consultant;
- It was recognised that contamination risks may remain on the site. In such a case, a LT-EMP would be required to document areas where residual contamination is present on the site, and information on management measures adopted. Provisions contained in the LT-EMP would need

to have a mechanism to be enforceable. A revised RAP would be prepared to document where and how management measures could be implemented.

4.7 Phase 2 Assessment Detailed Site Investigation (EGA 2024)

Environmental Group Australia (EGA) was engaged by Mirvac Residential (NSW) Developments Pty Ltd (the client), to undertake a Phase 2 Assessment Detailed Site Investigation for the site located at Western Sydney University – Milperra Campus, Milperra NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

EGA had the following project appreciation:

- The entirety of the site covers an area of approximately 19.64 ha;
- The site was formerly utilised as a university campus with on-site accommodation, open space parkland, playing fields and associated infrastructure;
- The demolition of on-site structures as part of the redevelopment of site was completed across 2024 and 2025;
- The site is proposed for redevelopment comprising a low-density residential land use setting;
- Historically the site has been utilised for agricultural activities with rural-residential structures;
- A Detailed Site Investigation (DSI) was carried out for the site in December 2019 and January 2020 by Alliance Geotechnical (AG), which identified five (5) areas of environmental concern;
- A Remedial Action Plan (RAP) was prepared for the site by AG in January 2020, which identified four (4) data gaps requiring further assessment;
- A Phase 2 Assessment Detailed Site Investigation was required to address data gaps identified within AG 2022;
- Non-friable asbestos impacted soils encountered structure footprints (AEC05) during completion of the demolition scope for site across 2024 and 2025 were partially remediated to facilitate continuation of the works in those areas. These partial remediation works generated approximately 7,626 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer;
- Non-friable asbestos impacted soils associated with AEC02 were partially excavated during construction of a sediment basin in the south of site. These partial remediation works generated approximately 4,156 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer;
- The Phase 2 Assessment Detailed Site Investigation was partially completed in January 2024 for AEC01, AEC02 and AEC03 with sampling of AEC05 in July 2025 following completion of the demolition scope for site.

The objective of the project was to:

- Determine the type, extent and level of contamination at the site as a result of past and current land use activities;
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting; and
- Provide recommendations for further investigation, management and/or remediation (if warranted).

EGA undertook the following scope of works to achieve the project objective:

- Review of the previous contamination assessment prepared for the site and identify data gaps that need to be addressed;
- The preparation of a Sampling and Analysis Quality Plan (SAQP);
- Laboratory analysis of selected samples collected during the field investigation; and
- An assessment of the contamination status of the fill materials within the site and the recommendation of any further remedial requirements associated with the redevelopment of the site (if necessary).

Based on EGA's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, EGA made the following conclusions:

- The detected concentrations of the contaminants of potential concern returned from the soils assessed within AEC05 are considered unlikely to present:
    - An unacceptable direct contact human health exposure risk;
    - An unacceptable vapour intrusion human health exposure risk;
    - A petroleum hydrocarbon management limit risk; or
    - An unacceptable ecological exposure risk.
- AEC01a was not accessible at the time of this data gap assessment and requires assessment within a future assessment prior to the start of remediation works;
- 6,500 m^2 of AEC05 associated with the footprints of the childcare centre and asphalt car parking within the north of site was not accessible at the time of the data gap assessment and requires assessment within a future assessment prior to the start of remediation works;
- Friable and Non-friable Asbestos Containing Materials (ACM) were identified within AEC01 during this assessment and previous contamination assessments undertaken;
- Friable and Non-Friable Asbestos Containing Materials (ACM) were identified within AEC02 during this assessment and previous contamination assessments undertaken;
- Non-Friable Asbestos Containing Materials (ACM) were identified within AEC03 during this assessment and previous contamination assessments undertaken;
- Non-Friable Asbestos Containing Materials (ACM) were identified within portions of AEC05 during this assessment and previous contamination assessments undertaken;
- Approximately 11,782 m^3 of stockpiled non-friable asbestos impacted spoil generated from partial remediation works within AEC02 and AEC05 requires further management/remediation;
- Stockpiled non-friable asbestos impacted soils associated with AEC05 require further characterisation to confirm their suitability chemically for treatment and re-use within site;
- Surficial asbestos identified within AEC01, AEC02 and AEC03 currently presents an unacceptable aesthetics risk and require further management / remediation;
- Based on the assessments undertaken as part of this investigation, EGA has concluded that the site has friable and non-friable asbestos impacted soil materials requiring remediation and further management;
- Non-friable asbestos impacted soil materials associated with AEC01, AEC02, AEC03 and AEC05 are suitable for treatment and re-use within site at depths unlikely to be disturbed as part of future site uses once the concentration of ACM has been reduced to below 0.01% w/w;
- Friable asbestos associated with AEC01 and AEC02 will require disposal off-site to a licensed waste receiving facility;
- An updated Remedial Action Plan is required to outline the remediation methodologies required to remediate the newly identified extents of contamination identified;
- Subject to remediation of the identified Areas of Environmental Concern and further assessment of data gap areas, the site can be made suitable for the proposed low-density residential development.

Based on the conclusions stated above and the background data gathered during the course of the investigation, EGA recommended:

- An updated site-wide Remedial Action Plan (RAP) is required to outline the remediation methodologies required to remediate the newly identified extents of asbestos contamination identified; and

- A supplementary contamination assessment is required within AEC01a, AEC04, AEC05, AEC06 and AEC07 prior to the start of remedial works in those areas.

4.8 Hazardous Building Material Survey (SE 2024)

Sydney Environmental Group Pty Ltd (SE) was engaged by Mirvac Residential (NSW) Developments Pty Ltd, to undertake a Hazardous Building Materials Survey of structures located within the Western Sydney University – Bankstown Campus, Milperra NSW prior to the commencement of demolition works.

SE had the following appreciation:

- The structures within the site are proposed for demolition; and
- A hazardous building material survey is required prior to demolition works to identify and document hazardous building materials within the structures situated within the site.

The objectives of the investigation were to:

- Identify hazardous building materials (HBM) within accessible areas of the structures on site;
- Provide a qualitative risk assessment of the hazardous building materials identified (if any);
- Provide recommendations on control measures and strategies for removal; and
- Prepare a Hazardous Materials Register for the site to ensure legislative compliance.

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

- Fieldwork, including investigation of subject areas;
- Collection of suspect hazardous building materials;
- Analysis of suspected hazardous building materials samples by a NATA accredited laboratory;
- Provide recommendations for the removal of hazardous building materials where identified; and
- Prepare a Hazardous Building Materials Register for the site, detailing location and type of HBMS present within the site.

For the report, HBM were limited to the following:

- Asbestos Containing Materials (ACM);
- Lead Containing Paint (LCP);
- Lead Containing Dust (LCD);
- Polychlorinated Biphenyls (PCBs);
- Synthetic Mineral Fibres (SMF); and
- Ozone Depleting Substances (ODS).

Table 4.8.1 Summary of Hazardous Building Materials Identified

Item	Areas Identified
Asbestos Containing Materials (ACM)	The following were inaccessible at the time of investigation for safety reasons and must be presumed to contain asbestos containing materials until further assessment is undertaken: • Building 05, exterior, white fibre cement panelling, asbestos containing fibre cement panelling; and • Buildings 01-05, 7-12, 20-24 interior, electrical distribution boxes, presumed non-friable asbestos containing fibre cement insulation board.
Lead Containing Paint (LCP)	LCP was identified, presumed, or suspected to be present on site withing the following locations: • Site-wide, exterior and interior, fire sprinkler system, lead based red paint system, 0.19 % w/w;

	• Building 01 - room G.157, interior, railing, lead based white paint system, 0.14 % w/w; • Building 01 - room G.157, interior, doorframes, lead based red paint system, 04 % w/w; and • Building 05, exterior, beams, lead based yellow paint system, 1.1 % w/w. All detected led was observed to be in good condition and low concentrations (< 2 % w/w) and can be disposed of as general solid waste with no management required.
Lead Containing Dust (LCD)	No LCD was identified, presumed, or suspected to be present within the site
Polychlorinated Biphenyls (PCB)	All fluorescent light fittings are presumed to contain PCB capacitors. Any refurbishment works are to be undertaken by trained and licensed electricians. Fluorescent capacitors should be disposed of separately.
Synthetic Mineral Fibres (SMF)	SMF was identified, presumed, or suspected to be present on site withing the following locations: • Buildings 01-05, 7-12, 14, 20-24, fire door inner core, SMF detected; • Buildings 01-05, 7-12, 14, 20-24, air conditioning units, presumed to contain SMF insultation; and • Buildings 01-05, 7-12, 14, 20-24, hot water system, presumed to contain SMF insulation.
Ozone Depleting Substances (ODS)	All air conditioning units are presumed to contain ODS. Any refurbishment or removal works are to be undertaken by trained refrigerant technicians.

4.9 Demolition Clearance Report (EGA 2025)

Environmental Group Australia Pty Ltd (EGA) was commissioned by Mirvac Pty Ltd (the client) to prepare a Demolition Clearance Report following the demolition of structures located within the site at 2 Bullecourt Avenue, Milperra NSW (hereafter referred to as 'the site').

In consultation with the client, EGA had the following appreciation of the site:

- The site occupies an area of approximately 19.6 hectares;
- The site is proposed for redevelopment, comprising demolition of existing structures, constructions of low-density residential housing and associated infrastructure;
- A Hazardous Building Materials Survey was carried out for the site by SE (2023) which identified asbestos containing building materials requiring removal prior to demolition works. Lead containing paints, potential PCB containing capacitors, synthetic mineral fibre insulation and potential ozone depleting refrigerant gases were also identified;
- A revision to the SE 2023 hazmat was prepare in February 2024, no changes were made to the recommendations in the earlier version;
- During the course of demolition works, unexpected finds in the form of asbestos containing building materials were encountered;
- Removal of hazardous building materials and demolition of the on-site structures was completed across October 2024 through to July 2025;
- All structures within demolition zones 1 to 4 have been demolished in accordance with the consent conditions;
- Structures within demolition zone 5 remain undisturbed; and

The client requires a Demolition Clearance Report to document the removal works undertaken, which has been prepared in line with condition 1.7 of the development consent (DA-1512/2023) by an appropriately qualified occupational hygienist.

The objective of the interim validation report was to:

- Prepare an interim site validation report to document the inspection and removal of hazardous building materials from structures within the site;
- Satisfy conditions 1.7 and 3.6 of the development consent (DA-1512/2023);
- To verify that the demolition areas are free from hazardous building materials like asbestos;
- To provide documentation to Council demonstrating that the demolition work was completed according to regulations;
- To certify that the land is stable and ready for subsequent remediation, excavation, construction, or other development activities; and
- To confirm there is no negative impact on the surrounding area for the completed demo0lition work, thereby preventing potential environmental risks.

The scope of works for EGA was to complete:

- Review of the previously prepared contamination reporting associated with the identification and removal of hazardous building materials within the site; and
- An assessment of the demolition works completed in the context of the demolition consent conditions (DA-1512/2023).

Removal of identified hazardous building materials and unexpected finds encountered during demolition was carried out from October 2024 to July 2025 as per requirements detailed SE (2023) and in line with the SafeWork NSW Code of Practice: How to Safely Remove Asbestos (2022).

Visual asbestos materials clearance inspections were completed by a licensed asbestos assessor or competent person at the completion of removal works. A systematic grid based visual inspection of the residual soil surface in the structure footprints was also undertaken at the completion of works.

Based on the information presented in the report, it was the opinion of EGA that:

- Hazardous building materials identified and recorded in the hazardous building materials register prepared for site (SE 2023) were removed (where required after further assessment);
- Previously unidentified suspected hazardous building materials encountered during demolition works were inspected by a suitably experienced occupational hygienist and removed by an appropriately licensed asbestos removalist, prior to the recommencement of works;
- Following the removal of hazardous building materials, and at the completion of demolition works, asbestos materials clearance inspections reports were prepared by a suitably qualified occupational hygienist;
- Conditions 1.7 and 3.6 of the development consent (DA-1512/2023) have been satisfied;
- Demolition zones 1 to 4 are free from hazardous building materials, stable and ready for the proposed remediation scope at the site;
- No negative environmental impacts on the surrounding area were noted as a result of the completed demolition scope; and
- Please remain diligent and adhere to the restrictions within the body of this report and the limitations stated below.

4.10 Previously Complete Remediation Works

4.10.1 AEC01 – Friable Asbestos Soil

Partial remediation works were completed within AEC01 during the demolition scope for site to reduce the risk of potential cross contamination resulting from plant traffic around site. Friable asbestos impacted soil materials associated with previous sampling locations 'EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39' were excavated and disposed off-site on 13 December 2024.

Soil materials within a 5 x 5 m vicinity of 'EBH2', 'EBH3', 'EBH5', 'BH39', and 'SS10' were excavated to 0.6 m BGL (below ground level). The soil materials were temporarily stockpiled atop geotextile and subjected to a waste classification prior to disposal off-site to a licensed receiving facility. Removal works were undertaken by ASP Pty Ltd, ASP Pty Ltd, a Class A Licensed Asbestos Removalist (AD210968), under the supervision of SE.

Following removal works, the residual soil surface within the subject areas were subject to a systematic grid based visual inspection. No asbestos containing materials were not observed on the residual soil surface within the subject area during or following the removal works. Validation samples (500 ml) were collected from the base and the walls of the excavation and submitted for laboratory analysis (WA DOH 0.001%). Asbestos (FA/AF or ACM) was not detected above the laboratory limit of reporting within any of the validation samples collected.

Boundary control airborne asbestos monitoring was undertaken for the duration of the removal works. Additionally, clearance airborne asbestos monitoring was undertaken within the subject area following the completion of removal works.

The friable asbestos hazard associated with the sampling locations EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39' is considered to be remediated and validated. An asbestos materials clearance inspection report was prepared on 20 December 2024, the details of these works will be required for inclusion within the site validation report.

EGA notes that the surrounding soils are known to be impacted by asbestos fibre cement fragments and require further remediation to manage the non-friable asbestos risk. One sampling location 'EHB1' previously identified as impacted by friable asbestos within AEC01 was not remediated due to a tree protection zone preventing disturbance of the underlying soils. These materials present a friable asbestos risk which will require further assessment and remediation.

4.10.2 AEC02 – Friable Asbestos Soil

Partial remediation works were completed within AEC02 during the construction of a sediment basin. Friable asbestos impacted soil materials associated with previous sampling locations 'EBH24' and 'EBH25' were excavated and disposed off-site on 4 October 2024.

Soil materials within a 5 x 5 m vicinity of 'EBH24' and 'EBH25' were excavated to 0.6 m BGL (below ground level). The soil materials were temporarily stockpiled atop geotextile and subjected to a waste classification prior to disposal off-site to a licensed receiving facility. Removal works were undertaken by ASP Pty Ltd, ASP Pty Ltd, a Class A Licensed Asbestos Removalist (AD210968), under the supervision of SE.

Following removal works, the residual soil surface within the subject areas were subject to a systematic grid based visual inspection. No asbestos containing materials were not observed on the residual soil surface within the subject area during or following the removal works. Validation samples (500 ml) were collected from the base and the walls of the excavation and submitted for laboratory analysis (WA DOH 0.001 %). Asbestos (FA/AF or ACM) was not detected above the laboratory limit of reporting within any of the validation samples collected.

Boundary control airborne asbestos monitoring was undertaken for the duration of the removal works. Additionally, clearance airborne asbestos monitoring was undertaken within the subject area following the completion of removal works.

The friable asbestos hazard associated with the sampling locations 'EBH24' and 'EBH25' is considered to be remediated and validated. An asbestos materials clearance inspection report was prepared on 14 October 2024, the details of these works will be required for inclusion within the site validation report.

EGA notes that the surrounding soils are known to be impacted by asbestos fibre cement fragments and require further remediation to management the non-friable asbestos risk.

4.11 Potential Sources of Contamination and Contaminants of Potential Concern

A review of the previously prepared contamination reporting identified the following sources of land contamination within the site:

- Shallow fill soils impacted with heavy metals;
- Asbestos contaminated fill materials;
- A former UST area;
- Redundant fibre cement services and septic tanks;
- Land fill gas migration from Kelso Landfill; and
- Groundwater migration onto site from neighbouring industrial land-uses.

4.11.1 Contaminated Fill Outside of Building Footprints

Three areas of asbestos impacted shallow fill soils were identified within the site from the previously prepared contamination reporting.

AEC01 (Friable asbestos impacted soils): Comprises one hotspot associated with sample 'EBH1' collected as part of the Coffey 2011 assessment. Delineation sampling was undertaken as part of the SEG 2024 assessment for five other sampling locations where friable asbestos was identified within AEC01, which were determined not to extend beyond the soils immediately adjacent the previous sampling locations. Sampling could not be undertaken in the vicinity of 'EBH1' at the time of that assessment, as such the asbestos impacts are yet to be fully characterised laterally, but presumed to follow a similar distribution.

The following delineation sampling works are required prior to remediation; test pitting immediately to the north, south, east, west of 'EBH1' with samples (500 ml soil samples submitted for NEPM WA DOH analysis) collected from the previously identified depth of impact which was 0.5 m bsgl (refer to section 8).

AEC01 (Non-friable asbestos impacted soils): Comprises approximately 3,950 m^2 of asbestos impacted shallow fill soils ranging in depth from 0.2 to 0.7 m bsgl. Friable asbestos in the form of poorly conditioned fibre cement fragments and debris was identified within AEC01 during the Coffey 2021, JBS&G 2018 and AG 2020 assessments. The impacts were subject to assessment as part of the EGA 2025 DSI where 20 test pits were advanced throughout the broader area in addition to delineation sampling targeting the soils immediately adjacent the previously identified impacts (with the exception of 'EBH1'). Asbestos was identified in three of the test pits advanced throughout the broader AEC01 area. The results of the delineation sampling indicated the previously identified friable asbestos impacts were limited to the soils immediately adjacent the previously sampled locations (5 m by 5 m).

The extent of non-friable asbestos within AEC01 is considered by EGA as sufficiently characterised. Remediation works should follow the completion of delineation sampling associated with 'EBH1'.

AEC02 (Non-friable asbestos impacted soils): Comprises approximately 10,425 m^2 of asbestos impacted shallow fill soils ranging in depth from 0.1 to 1.2 m bsgl. Friable asbestos in the form of poorly conditioned fibre cement fragments and debris were identified within AEC02 during the Coffey 2021 assessment. These materials were subject to remediation prior to the construction of the sediment basin in 2024 (refer to **section 4.10.2**). Surficial fibre cement fragments and trace FA detections below LOR were identified within AEC02 as part of the AG 2020 assessment. These impacts were subject to assessment as part of the EGA 2025 DSI where 52 test pits were advanced throughout the broader area, Non-friable ACM and FA < 0.001 % w/w asbestos was identified in twelve of the test pits.

As part of the construction of a temporary sediment basin within the AEC02 area, approximately 4,156 m^3 of non-friable asbestos impacted soil was excavated and stockpiled atop a geofabric layer adjacent to AEC02 pending further remediation and validation. The excavation of these materials did not involve the complete removal of asbestos impacts in the sediment basin area, as such further remediation and validation works are considered warranted in-line with the RAP.

The extent of non-friable asbestos within AEC02 is considered by EGA as sufficiently characterised. No further investigation works are required prior to the commencement of remediation works.

AEC03 (Non-friable asbestos impacted soils): Comprises approximately 15,480 m^2 of asbestos impacted shallow fill soils ranging in depth from 0.3 to 1.4 m bsgl. Non-friable asbestos fibre cement fragments were identified within AEC03 as part of the Coffey 2011 and AG 2020 assessments. These impacts were subject to assessment as part of the EGA 2025 DSI where 52 test pits were advanced throughout the broader area, Non-friable ACM and FA < 0.001 % w/w asbestos was identified in seven of the test pits.

Approximately 9,000 m^2 of AEC03 was inaccessible at the time of the assessment. Based off the wide spread nature of asbestos impacts in the vicinity of these data gap areas, EGA considers it reasonable to presume these soils will likely be impacted by asbestos. Further sampling is considered warranted to understand the nature and vertical extend of the impacts.

A supplementary assessment comprising of 19 test pits advanced to natural within the previously inaccessible portions of AEC03 is proposed prior to the commencement of remediation works (refer to **Table 8.7.1**).

4.11.2 Contaminated Fill Across Former Building Footprints

AEC05 (Non-friable asbestos impacted soils): Comprises approximately 14,050 m^2 of shallow fill soils presumed to be impacted with non-friable asbestos fibre cement fragments ranging in depth from 0.3 to 1.0 m bsgl. Non-friable asbestos fibre cement fragments were identified within structure footprints associated with building 1, build 5 and building 10. Partial remediation works were undertaken within these areas to make the area safe for continuation of demolition works (Refer to section 4.9), however the extent of the asbestos impacts were not chased out and validated in-line with the sites RAP and require further management.

Previously inaccessible soils within the structure footprints were subject to assessment following completion of the make safe and demolition works as part of the EGA 2025 DSI where 46 test pits were advanced within the accessible building footprints. Non-friable ACM was identified in one sampling location. The absence of broader asbestos impacts observed during this assessment is not considered by EGA to negate the need for further management and validation within the areas where asbestos was previously observed.

Approximately 4,750 m^2 of AEC05 was inaccessible at the time of the assessment. Based off the wide spread nature of asbestos impacts in the vicinity of these data gap areas, EGA considers it reasonable to presume these soils will likely be impacted by asbestos. Further sampling is considered warranted to understand the nature and vertical extend of the impacts.

As part of the make safe works completed within the structure footprints addressing asbestos impacts encountered during demolition, approximately 7,626 m^3 of spoil was generated and temporarily stockpiled atop a geofabric marker layer. The excavation of these materials did not involve the complete removal of asbestos impacts or validation sampling, as such further remediation and validation works are considered warranted within the affected structure footprints in-line with the RAP.

As the soils were stockpiled prior to the completion of the 2025 EGA assessment within AEC05, these materials are not considered characterised and will require assessment in line with **Table 8.7.1** prior to remediation.

4.11.3 Former UST Area

A SafeWork NSW search of the Stored Chemical Information Database (SCID) and the microfiche records held by SafeWork was requested as part of the AG 2020 investigation. Information provided by SafeWork NSW included details on two (2) underground storage tanks (USTs) formerly located in the central eastern section of the site. Review of the SafeWork NSW documentation indicated the 2 x 2,500L USTs were removed on Friday 19 December 1997 by Email Petroleum Systems.

Removal works were never subject to validation sampling to assess the potential for leaks and spills to have impacted the surrounding soils and groundwater. As such, further investigation is considered warranted to validate the suitability of the surrounding soils in the former location of the tanks for the proposed development.

4.11.4 Buried Services and Redundant Septic Tanks

The Site had a history of rural residential land use up to the 1970s. Consequently, there is a risk that abandoned septic tanks may remain at the site that could contain contaminated waste. The presence and condition of abandoned septic tanks or other unknown buried structure cannot be determined from discrete investigative methods, as such these risk will need to be managed during completion of remediation and bulk earthworks at the site.

Similarly for redundant asbestos containing fibre cement services, the risk posed by asbestos fibre cement conduits will need to be considered and managed during completion of remediation and bulk earthworks at the site. The presence and condition of known services will need to be identified as part of remedial works.

4.11.5 Land Fill Gas Migration from Kelso Land Fill

Putrescible waste accepted by the Kelso Landfill located to the south of site poses a potential source of Landfill gases within the southern portion of site. Landfill gases have the potential to migrate along pressure driven flows, as well as traveling in groundwater once dissolved. These pathways have not been investigated and require further assessment in the form of landfill ground gas monitoring within the south of site (refer to **Table 8.7.1**).

4.11.6 Groundwater Migration onto Site

Industrial land-uses to the north of site pose a potential source of groundwater contamination at the site.

The construction of eight groundwater sampling wells was undertaken as part of the AG 2020 investigation. Two wells installed along the northern boundary were found to be dry and were unable to be sampled. Groundwater samples were collected from the remaining six groundwater wells and analysed for the following analytes; TRH, BTEX, PAH, Phenols, Trace metals (As, Cd, Cr, Cr (VI), Cu, Ni, Pb, Zn), Nitrogen & phosphorus species and Anions and cations.

There were no exceedances of the site adopted criteria returned in the ground water results received as part of the AG 2020 assessment.

The following data gaps in the groundwater assessment were noted by the NSW EPA Accredited site auditor Lousie Walkden in her Site Audit Statement prepared for the AG 2022 RAP:

- Assessment for the presence of PFAS migrating from Bankstown Airport located 1km away was not undertaken and should be assessed; and

- Groundwater sampling density is insufficient for the size of the site to accurately characterise the groundwater beneath the site;

EGA agrees with this position and considered further assessment of the groundwater conditions to supplement the existing data within the site as warranted. The proposed assessment of groundwater is outlined within **Table 8.7.1**.

5. REFINED CONCEPTUAL SITE MODEL

5.1 Areas of Environmental Concern and Contaminants of Concern Requiring Remediation

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AECs) and contaminants of concern (COC) which have the potential to be present within and the site. The AECs identified are presented in attached **Figure 2** and associated contaminants of concern are presented in **Table 5.1.**

Table 5.1 Areas of Environmental Concern and Contaminants of Potential Concern

ID	Area of Environmental Concern	Contaminants of Concern	Affected mediums	Exposure risk	Proposed Remedial Strategy	Figure
AEC01	Friable Asbestos* Impacted Fill Soils	Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	3
	Non-Friable Asbestos Impacted Fill Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	3
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	Lead, Cadmium and Zinc	Soil	Human Health and Ecological Health	Off-site disposal	2
AEC02	Friable Asbestos Impacted Fill Soils **	Friable Asbestos	Soil	Human Health & Aesthetics	Off-site disposal	4
	Non-Friable Asbestos Impacted Fill Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	4
	Stockpiled Non-Friable Asbestos Impacted Soils	Non-Friable Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	4
AEC03	Non-Friable Asbestos Impacted Fill Soils	Asbestos	Soil	Human Health & Aesthetics	Remediation and on-site reuse at depth	5
AEC05	Building Footprints (Assessed)	Asbestos	Soil	Human Health	Remediation and on-site reuse at depth	6

Notes: * Five of the six friable asbestos hotspots remediated, soils associated with sampling locations 'EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39' have been removed off-site and the excavations validated. ** Both friable asbestos hotspots remediated, soils associated with sampling locations 'EBH24' and 'EBH25' have been removed off-site and the excavations validated.

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during future development by site workers; and
- Inhalation of contaminants during future use by site occupiers.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Future residents/end users;
- Flora and Fauna; and
- Neighbouring residential land users.

5.2 Potential Areas of Environmental Concern and Contaminants of Concern Requiring Investigation

The available site data was assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified potential areas of environmental concern (PAECs) and contaminants of potential concern (COPC) which have the potential to be present within the site and require further assessment. The PAECs identified are presented in attached **Figure 7** and associated contaminants of concern are presented in **Table 5.2.**

Discussion on the assessment of Potential Areas of Environmental Concern is presented in Section 8.

Table 5.2 PAECs and COPC

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk
PAEC04	Former Underground Storage or Petroleum-Based Product Onsite	Unleaded Petrol & Diesel Tanks	Heavy Metals, TRH, PAH, VOC/SVOC, Phenols	Soil & Groundwater	Human Health, Ecological Health & Aesthetics
PAEC05	Building Footprints (pending assessment)	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
	Stockpiled Non-Friable Asbestos Impacted Soils	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
PAEC06	Migration of Landfill Gas	Landfill Activities South of the Site	Methane, Carbon Dioxide, Carbon monoxide, Hydrogen sulphide	Ground Gas	Human Health
PAEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Industrial Activities North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP/OPP, PCB, PFAS, inorganic compounds	Groundwater	Human Health
PAEC08	Risk of redundant fibre cement conduits and septic tanks within the site footprint	Historical Agricultural Land-Use Activities	Metals, PAH, BTEX, TRH, Asbestos, OCPs, E.Coli and Thermotolerant Coliforms	Soil	Human Health and Ecological
PAEC09	Risk of asbestos contamination within the site footprint	Historical Agricultural Land-Use Activities	Asbestos	Soil	Human Health and Ecological

The potential contamination pathways are considered to be as follows:

- Inhalation/ingestion of contaminants released in dust during future development by site workers;
- Migration of landfill gases through pressure gradients or dissolved in groundwater; and
- Inhalation of contaminants during future use by site occupiers.

Relevant potential receptors are considered to include:

- Onsite construction and maintenance workers;
- Third parties during construction (adjacent site users and adjacent residents);
- Future residents/end users;
- Flora and Fauna; and
- Neighbouring residential land users.

5.3 Land Use Setting

EGA understands that the proposed development within the site will comprise construction of residential housing and associated infrastructure within a low-density residential land use setting. The proposed development will entail subdivision of the site into up to 430 residential lots, approximately 2 ha of conservation land in the north-east corner of site and three open space areas / public parks.

As the proposed future site use is redevelopment under a low-density residential land use setting, EGA considers it appropriate to adopt the 'HIL A – Low-Density Residential' criteria for residential lots. 'HIL C – Open Space / Parkland' criteria will be applied to the portions of site developed as public parkland and conservation areas. 'HIL D – Commercial / Industrial' criterial will be applied to the portions of site developed as roadways and road corridors.

Guidance on the adopted land-use scenarios is provided in Section 2.2 of Schedule B (1) of the National Environment Protection Measure (Assessment of Site Contamination) 2013 (NEPM ASC 2013), in order to assess the site for any future proposed land use as well as the current land use.

5.4 Direct Contact – Human Health

EGA understands that the site is proposed for development of low-density residential dwellings, associated roadways and infrastructure. EGA further notes that demolition of structures within the site and importation of filling materials may complete a direct contact exposure pathway for residential receptors.

Known direct contact human health exposure risks are present within AEC01a requiring further assessment prior to the start of remedial works within a future stage of the project. A small portion of the previously inaccessible areas within site identified as AEC05 remain covered by hard stand and will require further assessment. As such, further consideration of the direct contact risk is required during these works.

EGA recommends a pragmatic approach during the course of any required intrusive excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified and experienced and experienced environmental consultant.

5.5 Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) must be present onsite. The historical evidence reviewed indicated a very low likelihood for a potential primary source to be present on the site.

Potential sources of groundwater contamination were observed immediately south and north/north-east of the site, associated with landfill activities to the south and industrial land use activities to the north/north-east of the site. A supplementary groundwater assessment will be undertaken at the site to further assess these sources.

Potential sources of vapour intrusion were observed within the western portion of the site, associated with former petroleum and diesel underground storage tanks that are understood to have been removed from the site, landfill activities south of the site and industrial land uses to the north/north-east of the site. While the tank has been removed from site, further vapour intrusion assessment is considered necessary to confirm the surrounding residual soils do not pose a risk .

Asbestos containing materials are also understood to be present across the site footprint, requiring remediation and as such, further inhalation human health consideration is warranted during the remedial and validation works at the site.

EGA recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and

further investigation of the fill materials should be carried out by a suitably qualified and experienced environmental consultant.

5.6 Management Limits for Petroleum Hydrocarbon Compounds

NEPM ASC 2013 notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and

- Effects on buried infrastructure (e.g. penetration of or damage to, in-ground services by hydrocarbons).

Schedule B1 of NEPM ASC 2013 includes 'management limits' to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPM ASC 2013 also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

Further consideration of this value is warranted with respect to the former petroleum underground storage tank assessment and in the event any unexpected finds are encountered as part of this assessment.

5.7 Aesthetics

The aesthetic criteria adopted for the site comprises the following:

- Fill material remaining on-site to contain no demolition or other types of anthropogenic material greater than trace quantities (>5%);
- No odorous or stained materials remaining on-site; and
- No remains of dead animals remain on-site.

Redundant services, conduits, septic systems to be removed where encountered and any staining/odours associated with these are to also be removed.

During construction, the public and construction employees, may complete an aesthetics exposure pathway between potential contamination and receptors.

Due to the known presence of asbestos containing materials on-site within surficial and fill soils, further consideration of this value is warranted.

5.8 Terrestrial Ecosystems – Ecological Health

Section 3.4.2 of Schedule B1 NEPM ASC 2013, advises a pragmatic risk-based approach should be taken when assessing ecological risks in residential and commercial / industrial land use settings.

EGA understand that the proposed development would include a residential subdivision with comprising construction of low-density residential dwellings, associated roadways and infrastructure. The rest of the site would generally consist of open space and landscaped areas. In these areas, it is considered that an ecological exposure pathway may be present between potential contamination and onsite receptors.

EGA recommends a pragmatic approach during the course of any required intrusive / excavation works. If contamination is suspected, works should stop, an unexpected finds protocol should be followed and further investigation of the fill materials should be carried out by a suitably qualified and experienced environmental consultant.

5.9 Drinking Water Use

Expected poor regional water quality as a result of historical regional agricultural land use activities and disturbance, is considered likely to prevent groundwater from being a drinking water resource of value.

There are no groundwater bores onsite or down-gradient of the site, registered for drinking water use. It is noted that a reticulated mains potable water supply is available in the area. No further consideration of this value is deemed necessary as drinking water will not be sourced from the site as part of the future redevelopment plans.

5.10 Recreational Water Use

Surface water courses within and proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on observations, it is considered unlikely that surface water courses within close proximity to the site would be used recreationally for swimming, fishing, consumption, or water sports. Potential receptors of groundwater extraction and subsequent recreational use as part of irrigation systems may include future residents, maintenance workers, and ecological receptors.

There is a potential, albeit low, that the usage of groundwater within the site, would be utilised for irrigation across the site footprint following redevelopment and as such, further consideration of this value may be warranted pending the findings of the supplementary contamination assessment.

5.11 Aquatic Ecosystems

Surface water courses within and proximal to the site include an unnamed tributary of Kelso Creek, located approximately 300 m south of the site, Kelso Creek located approximately 600 m south of the site, and Georges River located approximately 1.3 km south-west of the site.

Based on the observations made by AG (2022) and SE (SE 2024), there is a moderate potential for groundwater contamination at the site, related to surrounding landfill and/or industrial activities. Further consideration of this value may be required pending the findings of a supplementary contamination to be undertaken.

6. SITE ASSESSMENT AND REMEDIATION ACCEPTANCE CRITERIA

6.1 Site Assessment Criteria

Previous contamination assessments prepared for the site identified the following:

- Asbestos contamination in soils at the Site at concentrations exceeding site assessment criteria for Residential A land use;
- Soils at some areas of the Site had an unknown contamination risk that needed to be investigated for the COPCs; and
- An unknown risk of LFG migrating into the Site across the southern boundary that needed to be investigated.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, a summary of the assessment criteria adopted for this project are presented in **Table 6.1.1** below.

Table 6.1.1 Site Assessment Criteria

AEC ID	Risk	Criteria	Reference
AEC01a **AEC04** **AEC05** **AEC07**	Human Health Direct Contact	HIL A – Residential	Table 1A(1) in NEPC (2013) HILs in Table 1A (1) in NEPM ASC 2013 and HSLs in Table A4 of CRC Care Technical Report no. 10 (2011) Table 2 in HEPA (2020)
AEC04 **AEC05** **AEC06** **AEC07**	Human Health Inhalation/Intrusion	HSL A – Residential	Table 1A(2) in NEPC (2013) Table 1A(3) in NEPC (2013) Table 1A(4) in NEPC (2013) Table 1A(5) in NEPC (2013)
AEC01 **AEC02** **AEC03** **AEC05**	Human Health (Asbestos)	HSL A – Residential	Table 7 in NEPC (2013)
AEC01 **AEC02** **AEC03** **AEC04** **AEC05**	Aesthetics	Residential	Characteristics and processes in Section 3.6.2 and 3.6.3 in NEPC (2013)
AEC01a **AEC04** **AEC05**	Soil – Ecological	Urban residential / public open space	Table 1B(1) in NEPC (2013) Table 1B(2) in NEPC (2013) Table 1B(3) in NEPC (2013) Table 1B(4) in NEPC (2013) Table 1B(5) in NEPC (2013) Table 1B(6) in NEPC (2013)
AEC04 **AEC05**	Management Limits (petroleum hydrocarbons)	Residential, parkland and public open space	Table 1B(7) in NEPC (2013)
AEC06 **AEC07**	Ground Gas	-	Section 4.3.4in NSW EPA (2020a)

6.2 Soil Criteria

The proposed future site use is redevelopment under a low-density residential land use setting, as such EGA considers it appropriate to adopt the 'HIL A – Low-Density Residential' criteria since this setting defines the soils that need to be remediated. Additionally, the proposed development comprises open space parkland areas where the 'HIL C – Open Space / Parkland' criteria will be applied as well as roadways and their associated corridors where the 'HIL D – Commercial / Industrial' criterial will be applied.

The criteria and their application are:

- Off-site disposal for soil contaminated above Commercial / industrial HIL D criteria;
- Re-use of treated soils as fill along road corridors if contaminated at or below Commercial / industrial HIL D criteria;
- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below Recreational EIL C criteria if placed at a depth of 0 to 2m below the final ground level5;
- Re-use of treated soils as fill in public open spaces / parkland if contaminated at or below Recreational HIL C and EIL C criteria if placed at a depth of more than 2m below the final ground level;
- Re-use of treated soils as fill on low-density residential land if contaminated at or below Residential EIL A criteria if placed at a depth of 0 to 2m below the final ground level; and
- Re-use of treated soils as fill on low-density residential land if contaminated at or below Residential HIL A and EIL A criteria if placed at a depth of more than 2m below the final ground level.

6.2.1 Human Health Based Investigation and Screening Levels

Table 6.2.1 Health-based Investigation Levels

	Health-based Investigation Level		
Analyte	**HIL A (mg/kg)**	**HIL C (mg/kg)**	**HIL D (mg/kg)**
Arsenic	100	300	3,000
Cadmium	20	90	900
Chromium (VI)	100	300	3,600
Copper	6000	17,00	240,000
Lead	300	600	1,500
Mercury (Inorganic)	40	80	730
Nickel	400	1,200	6,000
Zinc	7400	30,000	400,000
Carcinogenic PAHs (as B(a)P TEQ)	3	3	40
Total PAHs	300	300	4,000
DDT + DDE + DDD	240	400	3600
Aldrin + Dieldrin	6	10	45
Chlordane	50	70	530
Endosulfan	270	340	2,000
Endrin	10	20	100
Heptachlor	6	10	50
Methoxychlor	300	400	2,500
Chlorpyrifos	160	250	2,000
PCBs (Total)	1	1	7

Table 6.2.2 Health Screening Levels for Vapour Intrusion

	Health Screening Level (mg/kg) - HIL A / C / D			
Depth / Analyte	0 m to < 1 m	1 m to < 2 m	1m to < 4 m	4 m +
SAND – HIL A / C / D				
Toluene	160 / NL / NL	220 / NL / NL	310 / NL / NL	540 / NL / NL
Ethylbenzene	55 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Xylenes	40 / NL / 230	60 / NL / NL	95 / NL / NL	170 / NL / NL
Naphthalene	3 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Benzene	0.5 / NL / 3	0.5 / NL / 3	0.5 / NL / 3	0.5 / NL / 3
TRH F1	45 / NL / 260	70 / NL / 370	110 / NL / 630	200 / NL / NL
TRH F2	110 / NL / NL	240 / NL / NL	440 / NL / NL	NL / NL / NL
SILT – HIL A / C / D				
Toluene	390 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Ethylbenzene	NL / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Xylenes	95 / NL / NL	210 / NL / NL	NL / NL / NL	NL / NL / NL
Naphthalene	4 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Benzene	0.6 / NL / 4	0.7 / NL / 4	1 / NL / 6	2 / NL / 10
TRH F1	40 / NL / 250	65 / NL / 360	100 / NL / 590	190 / NL / NL
TRH F2	230 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
CLAY – HIL A / C / D				
Toluene	480 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Ethylbenzene	NL / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Xylenes	110 / NL / NL	310 / NL / NL	NL / NL / NL	NL / NL / NL
Naphthalene	5 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL
Benzene	0.7 / NL / 4	1 / NL / 6	2 / NL / 9	3 / NL / 20
TRH F1	50 / NL / 310	90 / NL / 480	150 / NL / NL	290 / NL / NL
TRH F2	280 / NL / NL	NL / NL / NL	NL / NL / NL	NL / NL / NL

Soil materials treated ex-situ for non-friable asbestos as part of the remedial scope for site will be assessed against the criteria most appropriate for the land-use where the materials are proposed for re-use within the site. Treated non-friable asbestos soils are not proposed for re-use within residential lots.

Table 6.2.3 Health Screening Levels for Asbestos

Analyte	Health Screening Level Residential A (Residential Lots)	Health Screening Level Residential C (Parkland)	Health Screening Level Residential D (Roadways)
Non-friable Asbestos	0.01 (% w/w)	0.02 (% w/w)	0.05 (% w/w)
Friable Asbestos (Asbestos Fines / Fibrous Asbestos)	0.001 (% w/w)		
All Forms of Asbestos	No visible asbestos on surface soils		

6.3 Ecological Investigation and Screening Levels

Ecological Investigation Levels (EIL) have been derived in accordance with NEPM (2013), Schedule B1, EILs for urban residential and public open spaces. Site specific EILs are derived for copper, nickel, chromium III and zinc, while generic EILs are applicable for arsenic, DDT and naphthalene.

In accordance with NEPC 2013, the EIL is calculated as the sum of the Added Contaminant Limit (ACL) and the Ambient Background Concentration (ABC) (i.e. EIL = ACL + ABC). ABCs have been based on the 25th percentile values for aged, urban settings, high traffic, NSW by Olszowy.

The derived EIL criteria for copper, nickel, chromium III, and zinc are based on high traffic volume and aged contamination (>2 years). Background concentrations and other input parameters were calculated from the background sample collected within AG 2020. EILs were calculated using the Ecological Investigation Level Calculation Spreadsheet provided on the National Environment Protection Council website (www.nepc.gov.au/nepms/assessment-site-contamination/toolbox).

Table 6.3.1 Ecological Screening Limits – Urban Residential / Public Open Space

Analyte	Ecological Screening Limit Urban Residential / Public Open Space (mg/kg)
FINE (SILT and CLAY)	
TRH F1 (C_6 - C_{10})	180
TRH F2 (C_{10} - C_{16})	120
TRH F3 (C_{16} - C_{34})	1300
TRH F4 (C_{34} - C_{40})	5600
Benzene	65
Toluene	105
Ethylbenzene	125
Xylenes	45
Benzo(a)pyrene	0.7

Table 6.3.2 Site Specific Ecological Investigation Limits – Urban Residential / Public Open Space

Analyte	Site Specific Ecological Investigation Limit Urban Residential / Public Open Space (mg/kg)
Arsenic	100
Copper	150
Chromium (III)	190
Lead	1100
Nickel	30
Zinc	320
DDT	180
Naphthalene	170

Anthropogenic Material/Aesthetics

The site adopted criteria for Anthropogenic Material and Aesthetic risks is based on the NEPM 2013 guidelines. Non-hazardous inert foreign materials are permitted within soil or fill materials subject to compliance within the site adopted criterial and aesthetic suitability (malodorous soils, discoloured chemical deposits, stained soil, large monolithic deposits/large inert foreign matter, putrescible refuse and animal remains). No specific trigger values are outlined within the guidelines, however, a criteria of 5% or less by weight has been adopted for acceptability.

In addition to the above criteria, consideration must be given to odour (e.g. hydrocarbon and solvents) where adoption of lower threshold criteria may be required if causes significant nuisance.

6.4 Groundwater Assessment

In-line with ANZECC (2000), results will be compared to Freshwater 95% criteria (ANZECC, 2000 / WQA 2018), stormwater reuse criteria (NSW DECC, 2006), irrigation trigger values (ANZECC, 2000), and recreational secondary contact trigger values (ANZECC, 2000).

For PFAS compounds (per-and polyfluoroalkyl substances):

'HEPA 2025, PFAS National Environmental Management Plan 3.0. National Chemicals Working Group of the Heads of EPA Australia and New Zealand 2025.'

Groundwater is not considered a resource for consumption at or adjacent to the site due to poor regional water quality resulting from industrial land-uses and salinity associated with Ashfield shales which underly the site. As such drinking water guidelines were not considered relevant for this project.

6.5 Landfill Gases

The interpretation of the landfill gas measurements will be based on the guidance in:

'NSW EPA 2020, *Assessment and management of hazardous ground gases Contaminated Land Guidelines'*

6.6 Soil Import

Imported soil materials to the site must meet the criteria for classification as VENM or ENM in-line with the *NSW EPA 2014 Waste Classification Guidelines* or *NSW EPA 2014 'The excavated Natural Material Order'.*

landscaping soils imported to the Site as part of development work must meet the following requirements:

- The Australian Standard AS4454 for compost, soil conditioners, and mulches;
- Contain no asbestos;
- Meet all NSW EPA and Council requirements; and
- Be managed under the NSW Resource Recovery Framework, which includes:
  1. Processing: Wastes must be processed appropriately before they can be reused.
  2. Testing: Products must be tested to ensure they are fit-for-purpose and free from harmful contaminants.
  3. Specifications: Processors and users must adhere to specifications outlined in Resource Recovery Orders and Exemptions regarding the end product and its use.

7. SUPPLEMENTARY CONTAMINATION ASSESSMENT

In light of data-gaps identified within AG (2022) and SE (2024), it has been concluded that a supplementary contamination assessment is required to sufficiently characterise the site and meet statutory requirements per relevant legislation and guidelines.

7.1 Objectives and Scope of Work

The objectives of the supplementary contamination assessment are to:

- Assess data-gaps identified in previous contamination assessments undertaken for the site (AG 2022 & SE 2024);
- Undertake an intrusive site investigation to facilitate the collection of representative soil samples;
- Undertake an intrusive site investigation to facilitate the installation of groundwater monitoring wells and collection of representative groundwater samples;
- Undertake an intrusive site investigation to facilitate the installation of ground gas monitoring wells and collection of representative ground gas samples;
- Engage a NATA accredited laboratory to analyse selected samples collected during the field investigation;
- Provide a thorough and conclusive assessment of the contamination status of the fill materials, ground gas (if present) and groundwater within the site;
- Provide updated advice to inform this RAP and detail any further investigation, management and/or remediation (if warranted);

7.2 Site Assessment Criteria

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section 5** of this project, the assessment criteria within **Section 6** have been adopted for this project.

7.3 Potential Areas of Environmental Concerns for Investigation

A review of the previously prepared contamination assessments prepared for the site identified potential areas of environmental concern (PAECs) and contaminants of potential concern (COPC) which require further assessment. The PAECs identified are presented in attached **Figure 7** and associated contaminants of concern are presented in **Table 7.3.1.**

Table 7.3.1 Potential Areas of Environmental Concern for Further Investigation

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk
PAEC04	Former Underground Storage or Petroleum-Based Product Onsite	Unleaded Petrol & Diesel Tanks	Heavy Metals, TRH, PAH, VOC/SVOC, Phenols	Soil & Groundwater	Human Health, Ecological Health & Aesthetics
PAEC05	Building Footprints (pending assessment)	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
	Stockpiled Non-Friable Asbestos Impacted Soils	Uncontrolled Demolition/Filling	Metals, PAH, BTEX, TRH, PCB, OCP/OPP, Phenols and Asbestos	Soil	Human Health & Aesthetics
PAEC06	Migration of Landfill Gas	Landfill Activities South of the Site	Methane, Carbon Dioxide, Carbon monoxide, Hydrogen sulphide	Ground Gas	Human Health

ID	Potential Area of Environmental Concern	Source	Contaminants of Concern	Affected mediums	Exposure risk
PAEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Industrial Activities North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP/OPP, PCB, PFAS, inorganic compounds	Groundwater	Human Health

8. SUPPLEMENTARY CONTAMINATION ASSESSMENT DATA QUALITY OBJECTIVES

Appendix B of NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 0** to **8.7** of this report.

8.1 Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The objective of this project is to assess whether the remedial goal has been achieved, and whether the site presents an unacceptable human health exposure risk, for the proposed land use setting.

This project is being undertaken because:

- The site is the subject of proposed redevelopment works;
- Historically identified areas of environmental concern on within site, have the potential to present an unacceptable human health and ecological exposure risk in the context of the proposed land use setting; and
- Previous investigations undertaken within the site were considered insufficient to characterise the site.

The project team identified for this project includes Sydney Environmental Group Pty Ltd, the client and the planning consent authority.

The regulatory authorities identified for this investigation include NSW EPA and the Local Council.

8.2 Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Do concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Have the contaminated soils been effectively isolated by the remedial strategy?
- Is the site suitable for the proposed land use setting, in the context of land contamination as a result of the chosen remedial strategy?

8.3 Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 8.2** for this investigation, will include:

- Data obtained in previous contamination assessments;
- The nature and extent of sampling at the site, including both density and distribution;
- Samples of relevant site media;
- The measured physical and/or chemical parameters of the site media samples (including field screening and laboratory analysis, where relevant); and
- Assessment criteria adopted for each of the media sampled.

8.4 Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- The project timeframes by EGA for this project, and subsequent remediation contractor works program;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of EGA field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the previously identified areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

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

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

8.5 Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

8.5.1 Rinsate Blank

One rinsate blank sample will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable equipment is used during the sampling works. Rinsate blank samples will be analysed for at least one of the analytes that the parent sample is being scheduled for analysis for (with the exception of asbestos).

8.5.2 Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C_6-C_{10}).

8.5.3 Intra-Laboratory and Inter-Laboratory Duplicates

Intra-laboratory and inter-laboratory field duplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate will be calculated.

8.5.4 Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

8.5.5 If/Then Decision Rules

EGA has adopted the following 'if/then' decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and

- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer **Section 8.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then EGA will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation (refer **Section 7.2**), EGA will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

8.6 Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and

- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

EGA will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern (excluding asbestos);

- Assignment of fieldwork tasks to suitably experienced EGA consulting staff, and suitably experienced contractors;

- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and

- Assignment of data interpretation tasks to suitably experienced EGA consulting staff, and outsourcing to technical experts where required.

EGA will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 8.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 8.4**	Critical samples analysed according to DQO	Refer **Section 8.7.1**
Critical samples collected	Refer **Section 8.4**	Analytes analysed according to DQO	Refer **Section 8.7.1**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 8.7.7**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
Sample Holding Times	Laboratory holding times provided by laboratory	Sample extraction and holding times complied with	Refer **Section 8.7.12**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 8.7.7**
Climatic conditions	Samples stored in 500ml zip-lock bags	Same LORs at primary laboratory	Refer **Section 8.7.7**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in 500ml zip-lock bags	Same laboratory for primary sample analysis	All primary samples to Eurofins | Environmental Testing
Analytical measurement units consistent	All measurement units the same between same analytes	Same analytical measurement units	Refer **Section 8.7.12**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer **Section 8.4**	Samples analysed according to SAQP	Refer **Section 8.7.12**
Media identified in SAQP sampled	Refer **Section 8.4**	Nil	Nil
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD (Metals & PAH only)	Minimum 5% duplicates No limit for results <10 times LOR 50% for results 10-20 times LOR 30% for results >20 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%	Nil	Nil
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Rinsate blanks	Analyte concern <LOR None collected for asbestos.	Nil	No exceedances of acceptance criteria

Field trip spikes (BTEX only)	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of acceptance criteria
Field trip blanks (BTEX only)	Analyte concentration <LOR None collected for asbestos.	Surrogate spike recovery	No exceedances of acceptance criteria

8.7 Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

8.7.1 Supplementary Contamination Assessment Sampling and Methodology

Table A in NSW EPA (2022) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots of defined diameter using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA (2022) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of NEPM ASC 2013 states that the number and location or sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

Table 4 in WA DOH (2021) indicates that where the 'likelihood of asbestos' is assessed as "possible" or "suspect", the investigation regimen should include a sampling density that is either judgemental or the same as that set out in Table A of NSW EPA (2022) for assessing asbestos.

As this project has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site) and taking into consideration Table 4 in WA DOH (2021), it is considered reasonable to adopt a judgemental sampling pattern. A preliminary sampling plan is provided in **Figure 7**.

The location of actual sampling points will be recorded by hand on a site plan.

The supplementary DSI assessment and hazardous building material survey sampling arrangements for this project are presented in **Table 8.7.1** below.

Table 8.7.1 Supplementary Contamination Assessment Methodology

AEC	Contamination Risk	Supplementary Contamination Assessment Methodology
AEC01a	Fill Materials impacted by lead, cadmium and zinc with the potential for asbestos containing materials to be present.	Six (6) test pits are to be advanced by an excavator to facilitate the collection of six (6) 10L samples screened for fragments of ACM >7mm and a subsequent 500 mL sample for quantitative asbestos. Sampling is to be undertaken every 1 m vertically, starting with the top 100 mm of soil and extending 0.3 m into natural materials. A grid-based walkover across the AEC footprint, to assess whether the top 100 mm of soil is visually free of asbestos is to be undertaken.

AEC	Contamination Risk	Supplementary Contamination Assessment Methodology
AEC03	Previously inaccessible non-friable asbestos impacted soils	Following completion of the outstanding demolition works at the site, a total of nineteen (19) test pits are to be advanced within the previously inaccessible portions of AEC03 via excavator. Test pits are to be advanced 0.3 m into natural materials and samples are to be collected from near surface and at ~0.5 m intervals within the soil profile or with changes in strata. To assess for asbestos, collection of one (1) 10L samples screened for fragments of ACM >7mm and a subsequent 500 mL sample for quantitative asbestos are to be collected from each test pit, totalling nineteen (19).
AEC04	Soil and groundwater potentially impacted by formerly decommissioned and removed underground storage tanks	Six (6) boreholes are to be advanced by a track-mounted drill rig to facilitate the collection of discrete soil samples, with two (2) boreholes to be advanced to groundwater to facilitate the installation of groundwater monitoring wells. Soil samples are to be collected from near surface and at ~0.5 m intervals within the soil profile or with changes in strata. Boreholes will be advanced to a maximum 4 m bgsl or 0.3 m into natural materials (whichever occurs first). Boreholes utilised for groundwater monitoring well installation are to be advanced to a target depth of 6 m bgsl, 2 m below inferred standing water level or practical refusal (whichever occurs first).
AEC05	Soil materials beneath building footprints that have not yet been assessed	Following completion of the outstanding demolition works at the site, a total of seventeen (17) test pits are to be advanced across existing hardstand areas within the site via excavator. Test pits are to be advanced 0.3 m into natural materials and samples are to be collected from near surface and at ~0.5 m intervals within the soil profile or with changes in strata. To assess for asbestos, collection of one (1) 10L samples screened for fragments of ACM >7mm and a subsequent 500 mL sample for quantitative asbestos are to be collected from each test pit, totalling seventeen (17).
	Stockpiled soils as part of make safe works during demolition	Prior to the remediation of stockpiled soils associated with AEC05, sampling to be completed in line with tables 3 and 4 of the sampling design guidelines (Part 1 - 2022) to chemically characterise the materials and confirm their suitability for re-use on-site at depth following treatment for non-friable asbestos.
AEC06	Hazardous ground gas migration from the adjacent Kelso landfill	Two (2) ground gas monitoring wells are to be installed along the southern boundary of the site via track-mounted drill rig. The wells are to be installed to depths ranging 3.5 – 6.0 m bgsl depending upon the gauged depth to groundwater, as detected in existing MW02 and MW03 prior to installation.
AEC07	Groundwater impacted by adjacent industrial land uses north and north-east of the site	Re-development and sampling of the existing groundwater monitoring wells at the site (MW01-MW08) will be undertaken. If groundwater wells MW06 and MW07 are observed to be dry during the sampling event, additional groundwater monitoring wells may need to be installed.

8.7.2 Sampling Methodology

Soil samples will be obtained by excavating test-pits with the use of a hydraulic excavator. Grab soil samples will be collected at each required sampling point directly from the base and walls of the excavation. Depending on the depth of the excavation footprint, an excavator may be required to obtain samples. In these instances, samples will be collected from soils in the centre of the excavator bucket, to avoid cross contamination from the excavator bucket.

Sampling will be guided by a combination of visual evidence (e.g. visible ACM, staining, etc), olfactory evidence (hydrocarbon odours) and field analytical instrumentation (e.g. portable PID soil headspace screening) where applicable.

Observations of the materials encountered during sampling will be recorded on the relevant field observation log with photographic record.

8.7.3 Groundwater Monitoring Well Installation Methodology

Groundwater monitoring wells are to be advanced to depths of groundwater where natural materials are not encountered prior. Groundwater monitoring wells are to be drilled at least two (2) metres below inferred standing water level (SWL), or practical refusal, whichever occurs first.

Monitoring wells will be constructed using 50 mm Class 18 PVC machine slotted screen and casing, gravel pack from the base to approximately 0.2 m above the top of the screen, followed by approximately 0.5 m of hydrated bentonite and grout to the surface.

8.7.4 Groundwater Monitoring Event Methodology

Depths to groundwater and the presence or absence of non-aqueous phase liquids are to be gauged using an interface probe prior to the monitoring event.

Low flow sampling will be adopted and groundwater will be extracted from the monitoring well at a rate so that the drawdown of water is minimised. Water quality meters will be used for stability to indicate the change from stagnant well water to representative formation water. The depth of sampling will be the middle of the water column within the screened interval, as determined prior to sampling.

Groundwater parameters will be monitored every 5 minutes for a minimum of three (3) rounds until concentrations have stabilised. If readings are still fluctuating, the concentrations will continue to be monitored for additional 5 minute intervals until conditions have stabilised. Field filtering of groundwater samples will be undertaken using 0.45 micron filters for metals analysis.

8.7.5 Ground Gas Monitoring Well Installation Methodology

Ground gas monitoring wells are to be advanced to depths approximately 1 m above the SWL at the site. The gauged SWL in surrounding groundwater monitoring wells will infer the depth of ground gas monitoring well installation.

Monitoring wells will be constructed using 50mm Class 18 PVC machine slotted screen and casing, gravel pack from the base to approximately 0.1 m above the top of screen, followed by approximately 0.3 m hydrated bentonite, grout to the surface and standpipe sticking above ground with gas cap tapped to take a quick-connect nipple.

Following installation, the monitoring wells will be developed using a landfill gas meter (or similar). Each well will be developed for a minimum of three (3) minutes.

8.7.6 Ground Gas Monitoring Event Methodology

Leak testing will be undertaken after 48 hours following installation of the ground gas monitoring wells. Ground gas monitoring will be undertaken during falling atmospheric pressure using a landfill gas analyser.

Prior to the sampling event, the ground gas meter will run for approximately 1 minute in ambient air and ambient air readings recorded. The ground gas meter will then be attached to the monitoring well and the relative and atmospheric pressure readings recorded.

The monitoring event will be undertaken by tapping a quick-connect nipple fitted with airtight tubes onto the gas cap at each well. Readings will be collected every 30 seconds for approximately 5 minutes at each gas well until the concentrations have stabilised. If readings are still fluctuating, the pump will continue to run and concentration readings recorded at one minute intervals until equilibrium is reached.

If high ground gas concentrations are recorded on the meter, then monitoring of the bore will be extended a further two (2) minutes to further assess the persistence of the gas detected within the bore. Ground gas parameters to be measured will include methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulphide, VOCs, differential pressure and borehole gas flowrate.

The ground gas meter will be purged between monitoring well sampling events to avoid cross contamination.

8.7.7 Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the AEC, the number of samples collected and the depth/interval the sample was collected from, e.g. a sample collected from AEC01 from the excavation footprint base, would be identified as AEC01-Base.

Project soil samples will be stored in laboratory prepared glass jars or zip-lock bags (if collected for asbestos). Project groundwater samples will be stored in laboratory prepared bottles.

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- EGA project identification number
- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)
- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

8.7.8 Soil Vapour Screening

Where the contaminants of potential concern include volatiles, project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on a field sampling point log and presented in test-pit logs.

8.7.9 Decontamination

In the unlikely event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

8.7.10 Laboratory Selection

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

8.7.11 Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available); and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on the site history, EGA has adopted the following laboratory analytical schedule for the supplementary contamination assessment. Project specific information is presented in **Table 8.7.2** below.

Table 8.7.2 Laboratory Analytical Schedule (Supplementary Contamination Assessment)

ID	Area of Environmental Concern	Analytical Schedule	No. of samples
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils with the potential for asbestos impacted soils to be present	Asbestos (0.001 %)	Minimum six (6) soil samples
AEC03	Previously inaccessible non-friable asbestos impacted soils	Asbestos (0.001 %)	Minimum nineteen (19) soil samples
AEC04	Underground Storage or Petroleum-Based Product Onsite	Heavy Metals, TRH, PAH, VOC, SVOC, Phenols	Minimum six (6) soil samples Two (2) groundwater samples
AEC05	Soil Materials Beneath Existing Building Footprints	Heavy Metals, TRH, BTEX, PAH, OCP and Asbestos (0.001 %)	Minimum seventeen (17) soil samples
	Stockpiled soils associated with AEC05	Heavy Metals, TRH, BTEX, PAH and OCP	Sampling in line with table 3 and table 4 of the sampling design guidelines part 1 (2022)
AEC06	Deep Uncontrolled Filling Adjacent to Southern Portion of Site	Nil (refer to **Section 8.7.6**)	N/A
AEC07	Adjacent Industrial Land Use to the North and North-East of the Site	Heavy Metals, TRH, BTEX, PAH, VOC, OCP, OPP, PCB, PFAS and inorganic compounds	Eight (8) groundwater samples

8.7.12 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 8.7.3** to **Table 8.7.6**.

Table 8.7.3 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Eurofins – Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos Bulk ID	No limit	AS4964:2004	0.01% w/w
Asbestos Quantitative	No limit	WA DOH 2021 / NEPM 2013	0.001% w/w
BTEX and TRH C_6-C_{10}	14 days	NEPM Schedule B3	0.1-20
Metals	6 months	USEPA 6010, 6020	0.1-5

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
TRH >C_{10}-C_{40}	14 days	NEPM Schedule B3	20-100
OCP	14 days	USEPA 8081	0.2
PAH	14 days	USEPA 8270	0.1-0.5
VOC	14 days	USEPA 8260	0.1-0.5

Table 8.7.4 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (ALS – Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	PLM/Disp. Stain.	Absence / presence
Asbestos	No limit	WA-DER	0.001% w/w
BTEX and TPH C_6-C_{10}	14 days	USEPA 8260	0.2-0.5
Metals	6 months	USEPA 200.8/3050/6010B	0.1-3
TPH >C_{10}-C_{40}	14 days	USEPA 8270	20-100
OCP/OPP	14 days	USEPA 8270	0.1-0.2/0.2-1
PAH	14 days	USEPA 8270	0.1
VOC	14 days	USEPA 8260	0.2-0.5
E.Coli	3 days	AS/NZS 4276.7	10 (cfu/g)
Faecal Coliforms	3 days	AS/NZS 4276.5	10 (cfu/g)

Table 8.7.5 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Eurofins – Water).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/L)
BTEX and TRH C_6-C_{10}	14 days	USEPA 5030, 8260B and 8020	0.001-0.02
TRH >C_{10}-C_{40}	7 days	USEPA 8015B & C	0.1
VOC	14 days	USEPA 8260	0.001-0.005
SVOC	14 days	USEPA 8260	0.001-0.005
PAH	7 days	USEPA 8270	0.001
OCP	7 days	USEPA 8081	0.0002-0.005
Metals	6 months	USEPA 8015B & C	0.0001-0.005
Cyanide	14 days	USEPASW 8469010	0.005
PCB	7 days	USEPA 8270	0.005
Phenols	7 days	USEPA 8260	0.001-0.005

Table 8.7.6 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (ALS – Water).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/L)
BTEX and TRH C_6-C_{10}	14 days	EP080	0.001-0.02
TRH >C_{10}-C_{40}	7 days	EP080 and EP071	0.05-0.1
VOC	14 days	EP074E	0.005-0.05
SVOC	14 days	EP074E	0.005-0.05
PAH	7 days	EP075(SIM)B	0.0005-0.001
OCP	7 days	EP068A	0.0005
Metals	6 months	EG020F and EG035F	0.0001-0.005
PCB	7 days	EP066	0.001
Phenols	7 days	EP074E	0.005-0.05

9. REMEDIATION STRATEGY OPTIONS DISCUSSION

The primary contaminant of concern at the Site is asbestos because of the potentially large quantity of soil likely to be impacted at the Site and the high cost of disposing asbestos waste to landfill in NSW.

The remediation of asbestos impacted soils is complex due to the practical constraints in locating and treating asbestos contamination. These practical constraints arise because of:

- The difficulty in predicting where asbestos fragments are located across the ground surface and in fill; and
- The difficulty in identifying the location and extent of asbestos contamination using discrete sampling methods.

Strategies have been adopted in this RAP to minimise, to the extent practicable, the potential impact of these constraints:

- Designing the preferred remediation strategy and preparing this RAP after comprehensive investigations have been conducted across the Site, which have identified the main areas of asbestos contaminated fill that require remediation. These investigations have also identified the areas of the Site where there is a low risk of significant asbestos contamination;
- Having practically all the above ground buildings demolished as permitted by the Development Consent, which has allowed hazardous buildings materials to be disposed off-site, the presence of visible asbestos cleared from building footprints, and the condition of the soils across the building footprints investigated;
- Developing a methodical sequencing of remediation tasks;
- Tracking excavated soils from cradle-to-grave;
- Adopting remediation criteria for treated soils based on managing risk in accordance with EPA guidance; and
- Following the removal and remediation of known asbestos contamination in an area, protocols are adopted by the bulk earthworks / civil works to manage and remove isolated, infrequent ACM fragments as they are found.

9.1 Remedial Goal

The remedial goal for this site is to remediate potential soil contamination (where identified) to a level that does not present an unacceptable human health exposure or environmental risks, making the site suitable for the proposed development. During remediation, consideration will be given to the following:

- Principles of ecologically sustainable development in line with Section 9 of the Contaminated Land Management Act 1997;
- Minimising waste generation under the Waste Avoidance and Resource Recovery Act 2001;
- Management of site contingencies; and
- Protection of worker health and safety, environmental management, and community relations.

9.2 Remediation Strategy Development Rationale

In general, the preferred hierarchy of options for site remediation and/or management specified by NSW EPA7 guidance is set out in s.6(16) Assessment of Site Contamination Policy Framework of Schedules A and B of the NEPM. This preferred hierarchy is:

- On-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and

- Off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,

if the above are not practicable:

- Consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material; or
- Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

When deciding which option to choose, the sustainability (environmental, economic and social) of each option should be considered, in terms of achieving an appropriate balance between the benefits and effects of undertaking the option.

These options were considered in light of the known conditions on the site and the practicality and cost associated with on-site treatment, off-site treatment and wholesale excavation. In the case of the latter removal of all materials would simply burden another site and comprise a waste of diminishing landfill resources and would in any event be contrary to the principals of waste minimisation and sustainability espoused by the NSW EPA. Moreover, the ability to reuse treated soils on-site complies with NSW EPA's waste hierarchy as follows:

- Waste Avoidance - including action to reduce the amount of waste generated by households, industry and all levels of government;
- Resource recovery - including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources; and
- Waste disposal - including management of all disposal options in the most environmentally responsible manner.

The RAP has evaluated remediation options for the main type of contaminated soil needing to be remediated, being non-friable asbestos impacted fill. For other types of soil contamination that may be found at the Site, appropriate remediation strategies will be developed, if required.

9.3 Remediation Options for Impacted Soil

The potential list of remediation options associated with impacted soil is extensive. Consequently, only relevant remediation strategies that have been considered which include the following:

- On-site Treatment and Beneficial Reuse; and
- Off-site landfill disposal – excavation / removal and disposal.

A summary of the advantages and disadvantages to these remediation options is provided overleaf in Table 9.4.1.

EGA notes that the client would prefer that the remedial works be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (EMP).

As such, the following remedial options were not considered for this project:

- Excavation and on-site containment; and
- Leave in-situ and cover with a clean soil cap.

9.4 Remediation Options for Impacted Groundwater and Ground Gas

As a supplementary contamination assessment for groundwater and ground gas at the site is required, remediation options relating to groundwater and landfill gas migration have not been assessed as the current contamination status and requirement of remediation is currently unknown. If the assessment of ground gas or groundwater risks indicates that remediation or management is required, preparation of a revised RAP setting out remedial and management options for those contamination risks will be undertaken.

Table 9.4.1 Remedial Options Summary

Treatment Option	Description	Advantages			Disadvantages		
		Technical	Financial	Logistical	Technical	Financial	Logistical
On-site Treatment	Soil raked and picked of physical contaminants. Treated and validated materials beneficially reused within the site.	Direct access to soil will be restricted by local roadways, foot paths and park areas with the appropriate mitigation measures	Potentially lower costs through with efficient / strategical methodology	Moderate excavation is required to remove all the AECs across the entire site Limited environmental management required during the works (e.g. dust, noise)	Treated and validated materials would remain on-site. Materials to be beneficially re-used within limited access areas (beneath roadways, parks, and footpaths)	Moderate to high labour costs during raking / picking of soils	Treated and validated material would remain on-site indefinitely.
Excavation and Offsite Disposal	Removal of contaminated soil to an EPA licensed facility. Validation sampling to demonstrate the conditions of the residual soil impact. Reinstatement of excavated areas with material validated as suitable for the intended land use.	Protective of human health including future tenants and construction workers. Facilitate future development of the entire site. No long-term EMP will be required.	No onsite operation and maintenance required.	No ongoing management required as the impacted soil will have been removed offsite.	Based on the soil investigation results, for off-site disposal purposes, the impacted soil to be excavated and removed offsite would require waste classification in accordance with the NSW EPA *Waste Classification Guidelines 2014.*	High remedial cost incurred to remediate the entire site.	Major excavation is potentially required. Odour, vapour and dust management required during the excavation works. May increase truck traffic in area to transport contaminated soil for a short period of time.

9.5 Summary of Preferred Remediation Options

Based on SE's assessment detailed above, the most suitable remedial strategy will comprise a combination of treatment options consistent the ultimate end land use of the site. **Table 9.5.1** below summarises the preferred remediation strategies with regards to the identified contamination within the site.

Table 9.5.1 Selected Remediation Strategies

AEC ID	Contamination Risk	Selected Remediation Strategy
AEC01	Friable Asbestos Impacted Fill Soils	Excavation and Off-Site Disposal
	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC02	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC03	Non-Friable Asbestos Impacted Fill Soils	On-Site Treatment and Beneficial Re-Use
AEC05	Soil Materials Beneath Existing Building Footprints	On-Site Treatment and Beneficial Re-Use
-	Direct Contact Risks in Soil Materials (*if identified*)	Excavation and Off-Site Disposal
-	Ecological Risks in Soil Materials (only) (*if identified*)	Excavation and Beneficial Re-Use at depths > 2 m bgsl
-	Aesthetic Risks (*if identified*)	Excavation and On-Site Treatment to Remove Foreign Materials; or Off-Site Disposal

Areas subject to remediation are provided in **Figure 2.**

Excavation and disposal off-site is considered as a contingency remedial strategy for all contamination risks as this is the most conservative option.

9.6 Overview of Remediation Options

The following method presents a guide for a qualified environmental consultant and specialised civil works and/or remediation contractor engaged to undertake the remediation works. All remediation works should be performed under the on-site guidance of a contaminated land consultant with sufficient experience in soil remediation activities.

Table 9.6.1 Proposed Remedial Works

AEC	Contamination Risk	Proposed Remedial Strategy
AEC01	Friable ACM in soil	Sampling targeting the depths of the previously identified impacts (0.5 m bsgl) to the north, south, east and west of 'EBH1' to delineate the lateral extent of friable asbestos. Excavation vertically to the base of impacted fill and laterally to the AEC edge or site boundary (whichever occurs first). Disposal offsite to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.
AEC01 **AEC02** **AEC03** **AEC05**	Non-friable ACM in soil	In-situ soils to be excavated vertically and laterally beyond the extent of asbestos impacts, spoil to be relocated to the designated asbestos treatment area. Previously stockpiled soils associated with AEC05 and AEC02 to be relocated to the designated asbestos treatment area. Ex-situ soils once at the treatment area to be spread out to a maximum thickness of 100 mm on a suitably prepared pad and subjected to mechanical raking, the licensed asbestos removalist will traverse the raked material in a systematic grid-based pattern removing fragments of bonded ACM by hand. At least two passes of raking and picking shall be undertaken, with a 90 ° direction change between each pass. Following successful validation, soil materials will be buried a minimum of 2 m below the finishing surface level (FSL). Alternatively, Excavation vertically to base of fill and laterally to the edge of fill or to the site boundary (whichever occurs first). Disposal off-site to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.
-	Direct Contact Risks in Soil (*if identified*)	Excavation vertically to the base of impacted fill and laterally to the AEC edge or site boundary (whichever occurs first). Disposal offsite to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.
-	Ecological Risks in Soil (only) (*if identified*)	Excavation vertically to the base of impacted fill and laterally to the AEC edge or site boundary (whichever occurs first). Soil materials will be buried a minimum of 2 m below the finishing surface level (FSL).
-	Aesthetic Risks (*if identified*)	Removal of aesthetic risks and disposal offsite to a licensed waste receiving facility as per NSW EPA Waste Classification Guidelines. The remediation contractor will retain transport and disposal records for all wastes removed off site.

10. REMEDIAL ACTION PLAN

10.1 Remediation Extents

The extent of contamination within the site is considered to is outlined within **Table 10.1.1** below.

Table 10.1.1 Approximate Remedial Extents

ID	Area of Environmental Concern	Approximate Extent
AEC01	Friable Asbestos Impacted Fill Soils	25 m^2 x 0.5 m bgsl Total ≈ 12.5 m^3 / 22.5 tonnes
	Non-Friable Asbestos Impacted Fill Soils	3,950 m^2 x (0.2 to 0.7 m / average 0.5 m bgsl) 1,975 m^3 / 3,555 tonnes
AEC01a	Lead, Cadmium and Zinc Impacted Fill Soils	1,000 m^2 x 0.25 m bgsl 250 m^3 / 450 tonnes *(Extent may vary following supplementary assessment)*
AEC02	Non-Friable Asbestos Impacted Fill Soils	10,425 m^2 x (0.1 to 1.2 m / average 0.5 m bgsl) 5,212.5 m^3 / 9,382.5 tonnes
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *4,156 m^3 / 7,480 tonnes*
AEC03	Non-Friable Asbestos Impacted Fill Soils	15,480 m^2 x (0.3 to 1.4 m / average 0.6 m bgsl) 9,288 m^3 / 16,718 tonnes
AEC05	Building Footprints (Assessed)	14,050 m^2 x (0.3 to 1.0 m / average 0.6 m bgsl) *8,430 m^3 / 15,174 tonnes*
	Stockpiled Non-Friable Asbestos Impacted Soils	Stockpiled: *7,626 m^3 / 13,726 tonnes*
AEC08	Risk of redundant fibre cement conduits and septic tanks within the site footprint	Site Footprint
AEC09	Risk of asbestos contamination within the site footprint	Site Footprint

Refer to **Figure 3, 4, 5** and **6** which indicates the areas which will be subject to remediation.

The extent of remediation identified in **Table 10.1.1** represents the known contamination at the site based on the previous contamination assessments undertaken at the site. There may be a risk of additional, presently unknown contamination being present at the site that may need to be remediated. Unknown contamination may be uncovered during the supplementary contamination assessment and bulk earthworks, requiring remediation.

It is noted that the lateral extent of remediation may be altered, during remedial works based on site observations and validation soil sample analytical laboratory results. EGA further notes that the extent of remediation required in AEC01a will be confirmed following the supplementary contamination assessment.

10.2 Overview

A methodical sequencing of remediation phases is an important strategy adopted by this RAP to minimise, to the extent practicable, the potential impact of the constraints associated with remediation of asbestos contamination listed in Sectio 9.

A generic sequencing of remediation phases have been developed so that each can be applied to any stage of the development. The sequencing of tasks has sought to provide a logical order that remediation work should be undertaken irrespective of the type and extent of contamination that may be present in a stage. Where a remediation phase is not relevant for a particular Development Stage, then the next remediation phase is considered and so on until the particular Development Stage has been fully remediated and validated. At this final time this area of land will be considered to be suitable for the proposed land use/s and a validation report will be prepared for that area, which will allow a Section A SAS / SAR to be issued followed by the commencement of above ground construction work.

The remediation of contamination in an area of the Site and the validation of its final condition as being suitable for the proposed land uses can only be completed when final site levels have been reached and no further bulk earthworks are required. This is because of the need to ensure that:

- All soils used as backfill at the Site have been tracked from cradle-to-grave;
- Only treated soils that have been validated as meeting the remediation criteria listed in Section 6 are used as backfill in areas of the Site having a land use consistent with the remediation criteria;
- Any isolated fragment of asbestos found during the excavation of soil not requiring remediation has been removed and validated;
- Surface soils that form the final site level contain no visible asbestos, as required by the remediation acceptance criteria listed in Section 6; and
- Imported soils used in bulk earthworks meet the EPA criteria for VENM and ENM as outlined in Section 6; and
- Imported landscaping soils meet the remediation acceptance criteria in Section 6.

It is critical for the contractor to fully understand the requirements of this RAP and to manage the remediation and movement of soils at the Site in accordance with this RAP.

Both remediation work and bulk earthworks will need to be undertaken in parallel at different parts of the Site and sequenced in a manner to facilitate the staging plan of the proposed development.

Validation reports will need to be prepared by the environmental consultant and site audit documentation will need to be prepared by the Site Auditor progressively as final site levels are achieved at a particular stage of the development.

10.3 Sequence of Remediation Works

The remediation works will be separated into phases to allow for the remediation contractor and the environmental consultants to plan the work. The staged remediation works will be as follows:

- Phase 1: Early Works and Protection of Trees
- Phase 2: Investigation of groundwater and LFG Risk (AEC06 and AEC07)
- Phase 3: Demolition Works and Supplementary Assessment within AEC01a, AEC03, AEC04, AEC05
- Phase 4: Remediation of Asbestos Contamination & Heavy Metal Contamination
- Phase 5: Management of contamination risks during bulk earthworks
    - 5.1 Excavate Remaining Soils to Final Excavation Level
    - 5.2 Backfill Excavated / Treated On-Site Soils in Fill Areas

5.3 Import VENM or ENM Soil to Fill Areas
5.4 Final Surface Soil Inspection

These phases are expanded in detailed below.

10.4 Phase 1 Early Works and Tree Protection

Prior to any works being undertaken at the site, a site-specific Safe Work Method Statement (SWMS) will need to be developed for the site tasks. A site-specific Work Health & Safety (WHS) Plan will need to be prepared for the site by the Principal Contractor. A Construction Environmental Management Plan (CEMP) will need to be developed for the site.

All environmental and WHS measures will need to be established and implemented at the site (e.g. erosion sediment control measures). The Principal Contractor will also need to establish a material tracking system to track all contaminated soil and sediment materials from cradle-to-grave.

Based on the extent and complexity of soil materials treatment, an estimated timeframe for remedial works is considered to be 12-18 months following the commencement of works. Referral to a remediation contractor should be made to better estimate remediation timeframes. It is expected that remediation timeframes will be further refined following appointment of the remediation contractor, and the staging of the remediation tasks in the contractor's works program.

The Civil contractor engaged to undertake the bulk earthworks scope at the site will need to prepare the following documentation prior to the commencement of works:

- A Construction Environmental Management Plan (CEMP); and
- A materials tracking plan as required by the remediation work.

Tree protection zones (TPZ) will be established around the drip line of existing trees within the site. Exclusion fencing will be utilised as a physical barrier demarcating TPZ's. No works will be undertaken within the tree protection zones as part of the Category 2 remedial scope.

Prior to the commencement of works, a project inception meeting will need to be held between the developer, Remediation / Civil Contractor, Environmental Consultant and Site Auditor. The inception meeting should cover, amongst other things, the requirements of this RAP and the roles and responsibilities of the relevant parties.

10.4.1 Notifications and Approvals

Notification of an intention to undertake remediation works on the site, will be submitted to the relevant planning consent authority, 30 days prior to remediation works commencing. The proposed remediation works are consistent with Category 2 under SEPP Resilience and Hazards 2021, which does not require consent from the planning authority. Approval for Category 1 works under the SEPP Resilience and Hazards 2021 is being sort for the client as part of the proposed future bulk earthworks scope for the site.

The following information will also be provided to the planning consent authority, 14 days prior to the commencement of remediation works:

- Copies of the contamination assessment report and this RAP; and
- Contact details of the contractor appointed to undertake the remediation works; and
- Contact details of the parties responsible (if not the remediation contractor) for ensuring remediation works comply with relevant regulatory requirements.

The Principal Contractor will need to obtain specific related approvals as necessary to implement the works. A notification will be submitted to SafeWork NSW at least 5 days in advance to undertaking any asbestos removal works. The removal works will be undertaken by a suitably licensed contractor.

It should be noted that:

- Removal of friable asbestos will require the contractor to hold a Class A licence; and
- Removal of non-friable asbestos will require the contractor to hold a Class B licence.

Within one month of completion of remediation and validation works, a notification will be submitted to the planning consent authority.

10.4.2 Existing Trees

Remedial works will be carried out, up to the boundary of tree protection zones, or where root systems are encountered, whichever occurs first. Where contamination is found to extend within the TPZ, further management will be required as part of future works completed under Category 1 approvals during the bulk earthwork stage for the project.

The north-east portion of site associated with the childcare centre is mapped as an environmental conservation zone (refer to **figure 2**), no works will be undertaken within this area as part of the Category 2 remedial works. The required investigatory and remedial scopes within the environmental conservation zone will be completed under the appropriate approvals as part of the future Category 1 works proposed during bulk earthworks. Land Identified on the Biodiversity Values Mapping will remain undisturbed as part of the Category 2 remedial works.

10.4.3 Phase 1 Hold Point

No Phase 3 work in any part of the Site is to occur until the environmental consultant has advised the Site Auditor in writing that all other Phase 1 early work has been completed, and the Site Auditor has reviewed and approved the Phase 1 documentation and issued a written approval for Phase 3 work to proceed.

10.5 Phase 2: Further Investigation of Groundwater and Land Fill Gas (AEC06 and AEC07)

AEC06: A supplementary contamination assessment will be undertaken within AEC06 to determine whether migration of off-site hazardous ground gases are migrating onsite requiring further management. Two ground gas monitoring wells will be installed within the southern portion of the site and will undergo a gas monitoring event to determine whether further management is required.

AEC07: A supplementary contamination assessment will be undertaken to address AEC07 and determine whether migration of contaminants associated with off-site industrial activities are migrating onsite requiring further management. The existing eight groundwater monitoring wells will undergo a groundwater monitoring event as part of the supplementary assessment.

Section 8.7.3 and **8.7.4** detail the requirements for investigation of ground water and land fill gas at the site.

10.5.1 Phase 2 Hold Point

Phase 3 works are not to commence until the following occur:

- The environmental consultant has issued a contamination assessment report prepared in accordance with EPA guidance documenting the LFG investigation and assessment;
- In the event that LFG concentrations exceed the site assessment criteria, the investigation will also need to determine the risk that LFG poses to the proposed development and detail any remedial measures required.

10.6 Phase 3: Demolition and Supplementary Contamination Assessment within AEC01a, AEC01, AEC03, AEC04 and AEC05.

10.6.1 Demolition Works

With the exception of the childcare centre in the north-east of site, the demolition scope for site is complete. A pre-demolition hazardous building materials survey was undertaken for the site by EGA (2024b). The identified asbestos containing materials were removed by a licensed asbestos removal contractor across 2024 and 2025. Following removal of identified asbestos containing building materials, the structures were inspected by an occupational hygienist to confirm the removal of hazardous building materials prior to demolition. A demolition completion letter was prepared by EGA in 2025 detailing the assessment, removal and clearance of asbestos containing building materials from on-site structures prior to demolition.

Portions of site remain covered by hard stand and asphalt, following completion of demolition works in these areas the underlying soils will be subject to assessment.

All demolition works to be completed in accordance with the site CEMP and the requirements set out in section 13 of the RAP. Structures to be visually assessed for hazardous building materials prior to demolition and following removal of hazardous building materials prior to demolition. Residual surface soils within the footprint of all structure and hardstand areas to be visually assessed following the completion of demolition works.

10.6.2 Supplementary Contamination Assessment

AEC01a: A supplementary contamination assessment will be undertaken within AEC01a, within the previously identified lead, cadmium and zinc area to determine whether asbestos is also a contaminant of concern associated with AEC01a requiring additional controls and assessment during the remediation and validation scope of works.

AEC01: Delineation of the friable asbestos soils previously identified at sampling point 'EBH1' within AEC01. Four test pits to be advance north, south, east and west of 'EBH1' with 500ml soil samples collected from 0.5 m bsgl and submitted for quantitative asbestos analysis (WA DOH 0.001%). In the event friable asbestos impacts are identified beyond the soils immediately adjacent 'EBH1' (5 m x 5 m) further sampling should be undertaken to fully characterise the lateral extents of the impacts.

AEC03: The assessment of previously inaccessible fill materials within AEC03 is largely complete. At the time of the previous assessments within AEC03 approximately 9,300 m^2 remained covered by hard stand and will require assessment prior to the commencement of remediation in these areas. Nineteen test pits will be advanced across the hardstand footprints as part of the supplementary assessment.

AEC04: A supplementary contamination assessment will be undertaken within AEC04, within the footprint of the previously decommissioned and removed underground storage tanks (UST). Six boreholes will be advanced within the vicinity of AEC04 with two extended to depth of groundwater as part of the supplementary assessment. Soil materials up to 4 m bgsl and groundwater will be assessed in the vicinity of the current extent of AEC04 to determine whether any residual contamination presides within the AEC as a result of the former UST.

AEC05: The assessment of previously inaccessible fill materials beneath on-site structures (AEC05) is largely complete. At the time of writing approximately 6,500 m^2 of AEC05 associated with asphalt carparking and the childcare centre remained covered by hard stand and will require assessment prior to the commencement of remediation in these areas. Seventeen test pits will be advanced across the hardstand footprints as part of the supplementary assessment.

Pending the results of the supplementary assessment, further remediation areas may be identified and remediated under an unexpected finds protocol or may be outlined within an additional addendum letter.

10.6.3 Phase 3 Hold Point

Phase 4 work in the conservation area surrounding the child care centre will not occur until:

- The environmental consultant has issued a Demolition and Contamination Assessment report prepared in accordance with EPA guidance documenting the demolition work and investigation of soil contamination under the building footprint of the former childcare centre. In the event that contamination is found to exceed the site assessment criteria, the report will need to detail any remedial measures required; and

- The Site Auditor has reviewed and issued a written approval of the Demolition and Contamination Assessment report and issued a written approval for Phase 4 work to proceed.

10.7 Phase 4: Remediation of Asbestos Contamination

Following the supplementary contamination assessment of AEC01a, AEC04, AEC05, AEC06 and AEC07, the remediation areas for known asbestos contamination identified within AEC01, AEC02, AEC03 and AEC05 will need to be marked out by the Environmental Consultant in conjunction with the Remediation Contractor.

10.7.1 Stockpile Non-Friable Asbestos Impacted Fill Materials

Non-friable asbestos impacted soils encountered within AEC05 during completion of the demolition scope for site across 2024 and 2025 were partially remediated to facilitate continuation of the works in those areas. These partial remediation works generated approximately 7,626 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer throughout the north and south of site. As these materials were excavated and stockpiled prior to the completion of supplementary assessment works within AEC05 they cannot be considered characterised, as such sampling will be required to confirm their suitability for treatment and re-use on-site.

Non-friable asbestos impacted soils associated with AEC02 were partially excavated during construction of a sediment basin in the south of site. These partial remediation works generated approximately 4,156 m^3 of non-friable asbestos impacted spoil which is stockpiled on site atop a geofabric layer.

Stockpiled soils are catalogued in **Table 10.7.1** and illustrated within **Figure 6**, movement of these materials must be tracked from cradle to grave in accordance with the materials tracking plan.

Table 10.7.1 Stockpiled Asbestos Soils Associated with AEC02 and AEC05

Stockpile ID	Figure	Approximate Estimated Volume (m^3)
AEC02		
AEC02-SP01	Figure 8	3,164
AEC02-SP02	Figure 8	992
AEC05		
AEC05-SP01	Figure 8	600
AEC05-SP02	Figure 8	98
AEC05-SP03	Figure 8	105
AEC05-SP04	Figure 8	275
AEC05-SP05	Figure 8	5,010
AEC05-SP06	Figure 10	70
AEC05-SP07	Figure 10	140
AEC05-SP08	Figure 10	70
AEC05-SP09	Figure 10	130
AEC05-SP10	Figure 10	25

Stockpile ID	Figure	Approximate Estimated Volume (m^3)
AEC05-SP11	Figure 10	40
AEC05-SP12	Figure 10	415
AEC05-SP13	Figure 10	265
AEC05-SP14	Figure 10	80
AEC05-SP15	Figure 10	3
AEC05-SP16	Figure 10	60
AEC05-SP17	Figure 10	215
AEC05-SP18	Figure 10	25

The stockpiled soil materials will be relocated to a designated treatment area for remediation ex-situ prior to re-use onsite at depth. Soils will be treated in batches of 10 to 30 m^3, soil materials will be spread out to a thickness of approximately 100 mm on a designated 'treatment pad'. The soil materials will then be raked, and any fragments of presumed asbestos picked by a suitably appropriate asbestos removalist. The licensed asbestos removalist will traverse the raked material in a systematic grid-based pattern removing fragments of bonded ACM by hand. At least two passes of raking and picking will be undertaken, with a 90° direction change between each pass.

The raked materials will be subject to a visual inspection by the supervising environmental consultant, only once all visible fibre cement fragments have been removed will soils be re-stockpiled for the purpose of validation sampling.

Following treatment and removal of all visible asbestos fibre cement fragments, the soil materials will then be stockpiled in 30 m^3 volumes and re-assessed against the adopted site assessment criteria. A visual inspection of the stockpiles and validation samples submitted for quantitative asbestos analysis (0.001 %) will need to be collected from the treated soil material stockpiles (one sample per 10-30 m^3 stockpile). If the materials meet the adopted site assessment criteria, the soil materials will be retained onsite. The soil materials will be buried beneath proposed roadways or within open space parkland areas planned for the site.

Until the receipt of validation results confirming suitability for re-use within the site, stockpiled treated materials are not to be mix or consolidated.

In the event that soil materials exceed the adopted site assessment criteria, a waste classification based on NSW EPA Waste Classification Guidelines 2014 must be prepared for disposal offsite to a licensed waste receiving facility.

Following removal/treatment of impacted materials, validation sampling (per **Section 11**) is to be undertaken.

10.7.2 Friable Asbestos Impacted Fill Materials

Friable asbestos was previously identified within two sampling locations within AEC02 identified as 'EBH24' and 'EBH25'. The soils associated with these locations were excavated and disposed off-site prior to validation sampling and require no further works in regards to the friable asbestos hazard (refer to **Section 4.9.2**).

Friable asbestos was previously identified within six sampling locations within AEC01 identified as 'EBH1', 'EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39'. Five of these locations 'EBH2', 'EBH3', 'EBH5', 'SS10' and 'BH39' were excavated and disposed off-site prior to validation sampling and require no further works in regards to the friable asbestos hazard (refer to **Section 4.9.1**).

Prior to remediation, the lateral extent of friable asbestos impacts associated with sampling location 'EBH1' should be delineated with sampling to the north, south, east and west.

The soil materials will be excavated and disposed off-site to a licensed waste receiving facility in line with the NSW EPA Waste Classification Guidelines 2014.

A SafeWork NSW Licensed Asbestos Assessor will need to inspect the residual soil surface of the excavation no later than 5 days following the completion of works and provide a visual clearance certificate of the excavation footprint. The soils within the surrounding area (10 m) are to remain undisturbed until the results of the validation sampling have been returned and the clearance report prepared.

Validation samples will need to be collected from the base of the excavation footprint and analysed for quantitative asbestos analysis (0.001 %) to confirm the removal of asbestos containing materials. If asbestos is observed or detected within the samples submitted, additional scraping of the ground surface and additional validation samples will need to be collected until no asbestos remains across the remediation area.

Following removal of impacted materials, validation sampling (per **Section 11**) is to be undertaken.

Should spoil generated during remediation of 'EBH1' need to be temporarily stockpiled within the site prior to load out, the following controls must be in place to mitigate the risk of cross contamination:

- Plant carrying out the transport must be underloaded and covered to avoid spills;
- Spoils to be temporarily stockpiled atop a geofabric layer and must not exceed a height of 2 m. Stockpiles will be covered with geofabric at all times, Geofabric to be suitably secured against strong winds and inspected regularly by the supervising environmental consultant;
- Following relocation or load out, stockpiled soils to be over excavated so that the soils within the footprint of the stockpile are removed 100 mm bsgl;
- Visual inspection of the stockpile footprint and transit routes following relocation or load out of stockpiled to be prepared by the supervising environmental consultant.

10.7.3 AEC01, AEC02, AEC03 and AEC05 – Non-Friable Asbestos Impacted Fill Materials

With the exception of soils surrounding 'EBH1' fill materials within AEC01, AEC02, AEC03 and AEC05 are impacted with non-friable asbestos and require remediation prior to re-use within site at depth. The fill materials should be excavated using an excavator, or similar, to the depth of impact outlined in **Table 10.1.1.**

EGA understands that the asbestos contamination is likely to be limited to fill clayey sand materials overlying fill CLAY materials.

In-situ fill materials will be excavated vertically to the depth of the previously identified asbestos impacts, or beyond the extend of observed fibre cement fragments if encountered passed this point. Spoil will be loaded directly into trucks and relocated to a designated treated area for remediation ex-situ prior to re-use onsite at depth. Soils will be treated in batches of 10 to 30 m^3, soil materials will be spread out to a thickness of approximately 100 mm on a designated 'treatment pad'. The soil materials will then be raked, and any fragments of presumed asbestos picked by a suitably appropriate asbestos removalist. The licensed asbestos removalist will traverse the raked material in a systematic grid-based pattern removing fragments of bonded ACM by hand. At least two passes of raking and picking will be undertaken, with a 90° direction change between each pass.

The raked materials will be subject to a visual inspection by the supervising environmental consultant, only once all visible fibre cement fragments have been removed will soils be re-stockpiled for the purpose of validation sampling.

Following treatment and removal of all visible asbestos fibre cement fragments, the soil materials will then be stockpiled in 30 m^3 volumes and re-assessed against the adopted site assessment criteria. A visual inspection of the stockpiles and validation samples submitted for quantitative asbestos analysis (0.001 %) will need to be collected from the treated soil material stockpiles (one sample per 10-30 m^3 stockpile). If the materials meet the adopted site assessment criteria, the soil materials will be retained

onsite. The soil materials will be buried beneath proposed roadways or within open space parkland areas planned for the site.

Until the receipt of validation results confirming suitability for re-use within the site, stockpiled treated materials are not to be mix or consolidated.

In the event that soil materials exceed the adopted site assessment criteria, a waste classification based on NSW EPA Waste Classification Guidelines 2014 must be prepared for disposal offsite to a licensed waste receiving facility.

Following removal/treatment of impacted materials, validation sampling (per **Section 12**) is to be undertaken. A competent person will need to inspect the residual soil surface of the excavation no later than 5 days following the completion of works and provide a visual clearance certificate of the excavation footprint. The soils within the surrounding area (10 m) are to remain undisturbed until the results of the validation sampling have been returned and the clearance report prepared

All materials must be tracked from cradle to grave in accordance with the materials tracking plan.

10.7.4 Other Types of Contamination and Unexpected Finds

Should results from the supplementary contamination assessment indicate the need for further assessment or remediation, the environmental consultant would decide if treatment under the unexpected finds protocol is sufficient or if there is a need to develop an addendum letter to report on site specific methodologies to remediate the newly identified AEC. The decision will be based on the extent of impact, access constraints, and any other observations.

During Phase 3 or Phase 4 works other types of contamination that are known or suspected of being present at the Site may be encountered, including but not limited to the following:

- Contaminated soil across the former hardstand areas or building footprints;
- Redundant septic tanks associated with the past rural use of the Site that may contain pathogens, asbestos, chemical residues, other hazardous building materials and waste;
- Asbestos fibre cement conduits associated with redundant services; and
- USTs that were not removed in the western part of the Site together with associated petroleum hydrocarbon contamination.

Table 9.6.1 outlines the preferred remedial options for addressing new contamination finds. Should a vapour intrusion risk associated with the former underground storage tanks in the south-west of site be identified an addendum to the Remedial Action Plan will be required detailing an assessment of the risks in addition a discussion on the most suitable management strategies.

Soils impacted by friable asbestos above the adopted site criteria or identified to present a human health risk will be excavated, subject to waste classification and disposed off site to a licensed waste receiving facility.

Soils identified to be ecologically unsuitable will be excavated and re-used on site beneath roadways or within residential lots at depths greater than 2m.

Redundant asbestos fibre cement conduits will be carefully exposed using a hydraulic excavator and removed in 2 m section by hand, separating section at the joins. Sections to be wrapped in two layers of polyethylene sheeting (200 µm thickness) prior to disposed off-site as asbestos waste. If the soils surrounding the conduit removal area are observed to be impacted with debris by the supervising environmental conduit, the impacted materials should be remediated in-line with **section 11.7.3**.

Redundant septic tanks if encountered will be removed in line with the following sequence of works:

- The tank will be exposed by careful excavation and examined for potential leaks and general condition by the supervising Environmental Consultant;
- Prior to the removal of the tank, any residual product (liquid or solids) will be removed from the tank and disposed of appropriately;
- The tank will be removed and the structures disposed of by a qualified contractor. Disposal records will be provided to an Environmental Consultant for inclusion in a validation report; and
- All associated infrastructure (i.e. the remnants including lines, respiration pits etc.) will be removed and disposed in a similar manner, if present.
- If evidence of leaks is observed in the tank and / or tank pit then excavate and stockpile impacted materials for waste classification prior to off-site disposal.

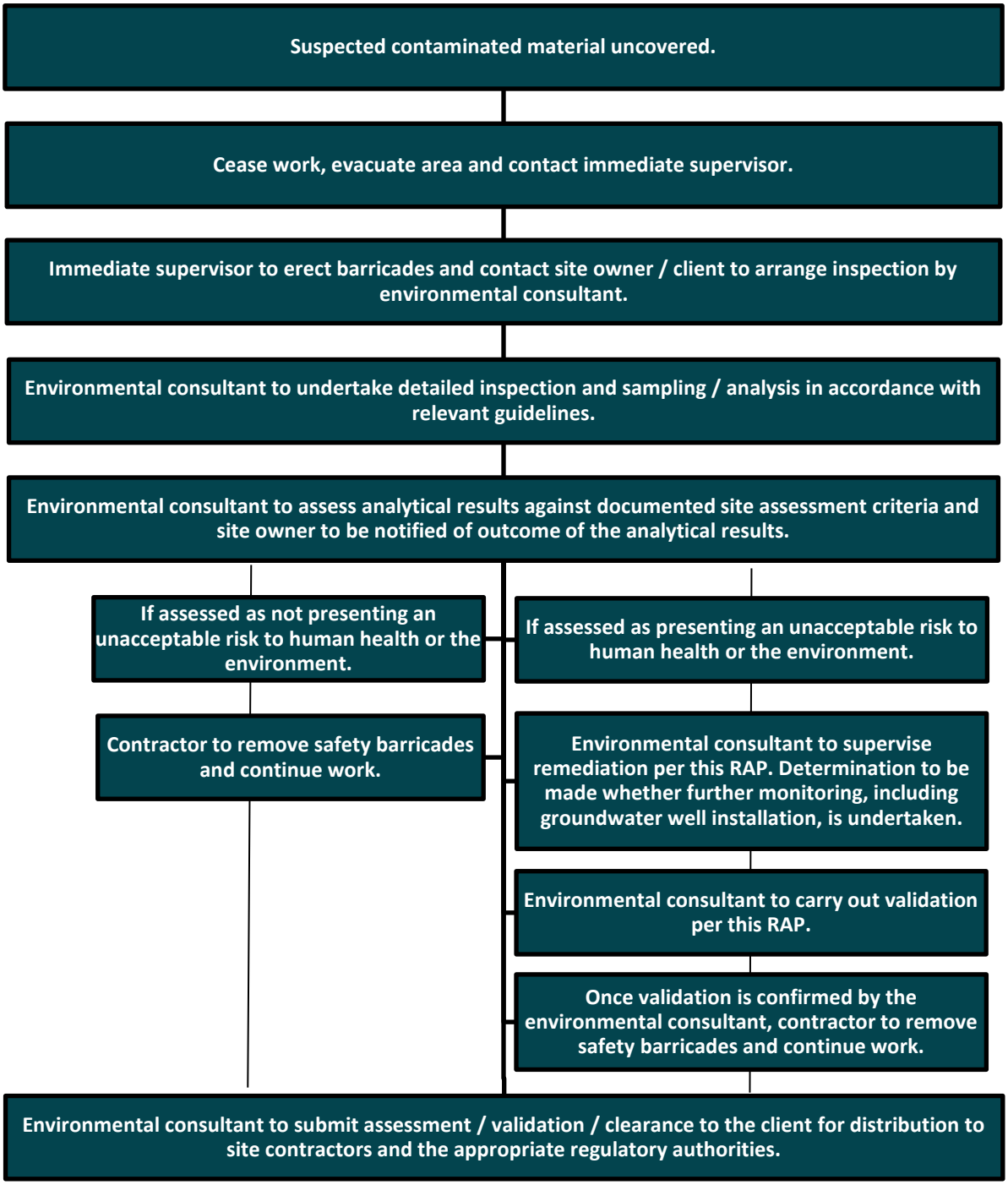
Movement of all materials within site must be tracked from cradle to grave in accordance with the materials tracking plan.

Site work may find contamination and buried materials not anticipated and addressed by the conceptual Site Model (CSM), which are referred to as Unexpected Finds. Prior to bulk earthworks starting at the site, all workers are to be advised of the potential presently unknown contamination which they may come across. Presently unknown contamination may include:

- Other USTs not recorded in the available historical information;
- Buried containers and drums; and
- Powders and other suspicious buried material.

In the event that any material suspected of containing potentially hazardous substances is found during remediation works, the following Unexpected Finds Protocol is to be followed:

Unexpected Finds Protocol



10.7.5 Decommissioning Asbestos Treatment Area

Following the completion of the treatment scope for the site, and after placement of temporarily stockpiled treated soils the designated area will require remediation to manage the residual asbestos risk from the treatment process.

Remediation of the treatment area will comprise of a scrape covering the entire treatment area footprint, extending vertically 100 mm bsgl. Spoil generated from the scrape will be stockpiled in 30 m^3 volumes within the treatment area footprint and re-assessed against the adopted site assessment criteria. Validation samples submitted for quantitative asbestos analysis (0.001 %) will need to be collected from the soil material stockpiles. If the materials meet the adopted site assessment criteria, the soil materials will be re-used on site at depth. The soil materials will be buried beneath proposed roadways or within open spaces planned for the site.

Stockpiles will be over excavated 100 mm into the underlying soils during relocation to ensure no residual soil remains within the treatment area.

The soil surface of the treatment area will be subject to a systematic grid based inspection and validation sampling in line with section 11.7.2.

10.7.6 Remediation Contingencies

Should validation samples / observations on-site indicate further contamination, additional remediation will be required. The additional vertical and lateral extents will be determined by the environmental consultant in attendance. Generally, a further 0.2-0.3 m of depth to be excavated vertically and 0.2-0.3 m of additional lateral excavation is considered reasonable prior to additional validation sampling. Following further removal of material, additional validation samples will be taken. This will be continued until validation samples meet the validation criteria.

Should spoil generated during remediation need to be temporarily stockpiled prior to disposal off site, the following controls must be in place to mitigate the risk of cross contamination:

- Plant carrying out the transport must be underloaded and covered to avoid spills;
- Spoils to be temporarily stockpiled atop a geofabric layer and must not exceed a height of 2 m. Stockpiles will be covered with geofabric at all times, Geofabric to be suitably secured against strong winds and inspected regularly by the supervising environmental consultant;
- Following relocation or load out, stockpiled soils to be over excavated so that the soils within the footprint of the stockpile are removed 100 mm bsgl; and
- Visual inspection of the stockpile footprint and transit routes following relocation or load out of stockpiled to be prepared with the supervising environmental consultant.

Following removal/treatment of impacted materials, validation sampling (per **Section 11**) is to be undertaken.

10.7.7 Phase 4 Hold Point

No phase 5 work is to occur in the particular Development Stage until:

- All asbestos impacted fill in the particular Development Stage has been removed and the remaining soils validated as meeting the asbestos Remediation Acceptance Criteria. This work need to be documented by the Environmental Consultant in an interim report; and

- The Site Auditor has reviewed and approved the Phase 4 interim report; and

- All phase 4 work in the particular Development Stage has been completed and the Site Auditor has issued a written approval for phase 5 work to proceed in the particular Development Stage where contaminated soil has been removed.

10.8 Phase 5: Management of contamination risks during bulk earthworks

There is a high likelihood that isolated asbestos fragments will be found in fill not located in designated remediation areas. To manage the safe removal of these fragments the procedures outlined below must be followed.

10.8.1 Phase 5.1 Excavate Remaining Soils to Final Excavation Level

All site workers are to attend regular toolbox meeting where the likelihood of isolated fragments of bonded asbestos being found in fill outside designated remediation areas is discussed along with the procedures that need to be taken by workers to dealing with such fragments.

In the event asbestos impacted fill materials are encountered, works are to stop and the unexpected finds protocol implemented.

Full time supervision of bulk earthworks will be required by an environmental consultant in order to maintain detailed records on the following:

- Condition of the soils encountered during bulk earthworks;
- Excavation procedures used during works;
- Types of machinery used to transport soils within site;
- Condition of stockpiled soils;
- Condition of geofabric layers and their fixtures;
- Document environmental procedures, their maintenance and efficacy;
- Copies of field records and photos for works completed;
- Documentation of the materials tracking procedures employed by the civil contractor;
- Documentation of the variation and thickness of fill types throughout the site;
- Monitor transport of materials by a contractor licensed to transport the waste; and
- Monitor transit routes and assessment of cross contamination risks.

Placement/re-use of treated soils at depth is not to occur in the particular Development Stage until:

- All Phase 5.1 work has been completed in the particular Development Stage;
- The Environmental Consultant has prepared an interim report on the Phase 4 works and concluded that no contamination remains in the particular Development Stage exceeding Remediation Acceptance Criteria; and
- The Site Auditor has inspected all final excavation surfaces in a particular Development Stage and issued a written approval for placement / re-use work to proceed in the particular Development Stage.

10.8.2 Phase 5.2 Placement / Re-use of Treated soils On-site at Depth

While the treated soils may be re-used within site based on the ACM concentration in the validation samples being less than the adopted land use criteria, ACM may still be present within the treated soil materials. As such, these soils must be re-used at depths within site which ensure they will not be disturbed and potentially left exposed as part of reasonable future land use scenarios. The following position has been adopted for these activities:

- Treated soils will not be re-used within residential lots;
- Treated soils will not be placed within the proposed alignment of services deeper than 2.5 m bsgl;
- No deep footings are proposed as part of the designs within open space parkland areas;
- EGA considers it reasonable to assume that any landscaping or tree removal activities within the future parkland areas is unlikely to disturb soils deeper than 1 m bsgl; and
- EGA considers it reasonable to assume that any disturbances to the soils within the proposed roadway corridors will be limited to maintenance of services.

EGA considers these assumptions to be sufficiently conservative, in the context of the potential risk that asbestos may remain within the soil materials following treatment. As such, the following conditions will be applied to the re-use of treated materials within the site:

- Treated soils will not be placed in the alignment of services deeper than 2.5 m bsgl;
- Re-use of treated materials within proposed road corridors will be limited to depths 0.5 m below the deepest expected service;
- Re-use of treated materials within open space parkland portions of the site will be limited to depths 0.5 m below the deepest expected service or 1.0 m bsgl whichever is greater; and
- No further excavation or bulk earthworks are to occur following the completion of placement works within a given development stage.

10.8.3 Phase 5.3 Import VENM or ENM Soil to Fill Areas

Material proposed to be imported to site as engineered fill, will be limited to materials certified as:

- Virgin Excavated Natural Material (VENM); or
- Excavated Natural Material (ENM).

VENM certification will be undertaken with reference to NSW EPA (2022). ENM certification will be undertaken with reference to NSW EPA Excavated Natural Material Exemption (2014).

All waste classification reports for proposed fill to be imported to the site are to be formally reviewed by the environmental consultant prior to importation to the site.

The remediation contractor will maintain detailed records of all fill imported to the site, including details of the supplier, the source of the fill, the quantities of the fill, vehicle registration numbers and the dates/times the fill was received on site.

The remediation contractor will inspect every load of material imported to site, to check the material is consistent with the material described in the VENM/ENM certification and each load is free of visual anthropogenic materials, staining or odours. The remediation contractor will maintain a documented record of each inspection.

The Protocol for import of VENM and ENM is to be as follows:

- VENM / ENM soil is to be tested, validated and documented in accordance with EPA guidance, with copies of this documented to be included in validation reports;
- Only VENM / ENM soil approved in writing by the environmental consultant is to be imported to the Site;
- All VENM / ENM imported to the Site is to be tracked from source to Site;
- The Contractor is to ensure that only approved trucks are used to import VENM / ENM soil to the Site;
- All VENM / ENM soil is to be inspected upon delivery to the Site by the Contractor. Any materials that are suspected of being contaminated or are inconsistent with EPA standards for VENM / ENM are to be rejected by the Contractor and are to be removed from the Site; and
- The Environmental Consultant is to validate VENM / ENM soil imported to the Site.

10.8.4 Phase 5.4 Final Surface Soil Inspection

Following the completion of bulk earthworks, the soil surface of the final finish level must be visually inspected by a competent person and an asbestos materials clearance inspection report prepared for inclusion in the validation reporting for that development stage.

The following methodology will be utilised for the visual clearance of residual soil surfaces:

- Subject area and immediate surroundings visually inspected for suspected asbestos containing materials, comprising systematic grid-based walkover with 2 m lane spacing; and
- Subject area photographed.

11 REMEDIATION AND VALIDATION DATA QUALITY OBJECTIVES

Appendix B of NEPM ASC 2013 provides guidance on the development of data quality objectives (DQO) using a seven-step process. In line with AG (2022), the following DQO for this project are set out in **Sections 11.1** to **11.7** of this report.

11.1 Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The objective of this project is to assess whether the remedial goal has been achieved, and whether the site presents an unacceptable human health exposure risk, for the proposed land use setting.

This project is being undertaken because:

- The site is the subject of redevelopment works comprising subdivision for residual land use; and
- Historically identified areas of environmental concern on the site, have the potential to present an unacceptable human health risk in the context of the proposed land use setting.

The project team identified for this project includes Environmental Group Australia Pty Ltd, and the client.

The regulatory authorities identified for this investigation include NSW EPA and the Local Council.

11.2 Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the sampling adequate to determine the risk of contamination at the site, including any potential offsite migration?
- If the data does not provide enough information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy.

11.3 Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 11.2** for this investigation, will include:

- Data obtained in previous contamination assessments and the proposed development plans;
- Understanding of the current site use and historic activities that have occurred;
- Geological and hydrogeological data relevant to the area, including physiochemical parameters for calculating ecological criteria;
- Site observations for the presence of visual/olfactory contamination indicators;
- Contaminant concentrations in soil at the site indicating the distribution of contaminants; and
- Further input to the decision will be sample collection and handling, field and laboratory QAQC and confirmation that data quality indicators (DQIs) were achieved.
- Survey dimensions of remediated areas and stockpiled quantities;
- Documentation tracking excavation of contaminated materials from cradle-to-grave (e.g. stockpile movements, trucking records, waste disposal records); and
- Assessment criteria are provided in **Section 6**.

11.4 Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- The results will be valid on the day samples are collected and will remain valid if no changes to site use occur, and contamination (if present) does not migrate on to site from off-site sources;
- The project timeframes by EGA for this project, and subsequent remediation contractor works program;
- Unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- Access availability of the site (to be defined by the site owner/representative); and
- Availability of EGA field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the previously identified areas of environmental concern (AEC) and may be altered based on the data collected during the supplementary contamination assessment.

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

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

11.5 Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

11.5.1 Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

For the purpose of waste classification assessment, collection / analysis of rinsate blank samples will not be required.

11.5.2 Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C_6-C_{10}).

For the purpose of waste classification assessment, collection / analysis of trip spike/blank samples will not be required.

11.5.3 Intra-Laboratory and Inter-Laboratory Duplicates

Intra-laboratory and inter-laboratory field duplicates will be collected at a rate of one per twenty (5 %) site samples collected. The duplicates collected will be analysed for the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate will be calculated.

11.5.4 Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

11.5.5 If/Then Decision Rules

EGA has adopted the following 'if/then' decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer **Section 11.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then EGA will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation (refer **Section 11.2**), EGA will undertake an assessment of the exceedance in the context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

11.6 Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

EGA will mitigate the risk of decision error by:

- Calculation of the 95 % upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern (excluding asbestos);
- Assignment of fieldwork tasks to suitably experienced EGA consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories; and
- Assignment of data interpretation tasks to suitably experienced EGA consulting staff, and outsourcing to technical experts where required.

EGA will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Table 11.6.1 Performance and Acceptance Criteria Summary

Completeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Critical locations sampled	Refer **Section 11.4**	Critical samples analysed according to DQO	Refer **Section 11.7.8**
Critical samples collected	Refer **Section 11.4**	Analytes analysed according to DQO	Refer **Section 11.7.8**
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer **Section 11.7.8**
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
Sample Holding Times	Laboratory holding times provided by laboratory	Sample extraction and holding times complied with	Refer **Section 11.7.8**
Comparability			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer **Section 11.7.8**
Climatic conditions	Samples stored in 500ml zip-lock bags	Same LORs at primary laboratory	Refer **Section 11.7.8**
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in 500ml zip-lock bags	Same laboratory for primary sample analysis	All primary samples to Eurofins | Environmental Testing
Analytical measurement units consistent	All measurement units the same between same analytes	Same analytical measurement units	Refer **Section 11.7.8**
Representativeness			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Appropriate media sampled according to SAQP	Refer **Section 11.4**	Samples analysed according to SAQP	Refer **Section 11.7.8**
Media identified in SAQP sampled	Refer **Section 11.4**	Nil	Nil
Precision			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Field duplicate / triplicate RPD (Metals & PAH only)	Minimum 5% duplicates and triplicates No limit for analytical results <10 times LOR 50% for analytical results 10-20 times LOR 30% for analytical results >20 times LOR	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%	Nil	Nil
Accuracy (bias)			
Field Considerations	**Assessment Criterion**	**Laboratory Considerations**	**Assessment Criterion**
Rinsate blanks	Analyte concentration <LOR. None collected for asbestos.		No exceedances of acceptance criteria

Field trip spikes (BTEX only)	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of acceptance criteria
Field trip blanks (BTEX only)	Analyte concentration <LOR None collected for asbestos.	Surrogate spike recovery	No exceedances of acceptance criteria

11.7 Step 7: Develop the Plan for Obtaining Data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

11.7.1 Remediation Monitoring Records

A daily record is to be maintained by the remediation contractor and supervising environmental consultant detailing daily remedial activities, estimated treatment quantities, and all bulk soil movements.

11.7.2 Validation Sampling

Validation should focus on collecting clear evidence to assess whether the key objectives have been met. Validation sampling programs should identify and delineate the lateral and vertical extent of contamination (if any) and arrive at a scientifically defensible and statistically valid data set which characterises the chemical concentrations and human health risk present at the site.

An appropriately experienced environmental consultant should be present onsite at all stages of the remediation works, to assess the extent of remediation required to render the site suitable for the proposed development. Site observations and field screening equipment can be used to assist in decision-making in relation to:

- The location and extent of any excavations to trace contamination or whether to remove additional soil;
- Create a more focused sample collection (number and location) and laboratory analysis; and
- The need to consider (or implement) any specific health and safety measures.

A systematic validation sampling pattern will be carried out, with one soil sample collected from the floor (per 25 m^2) and one soil sample collected from each wall (per 10 linear meters) of the remedial excavation footprints.

The validation sampling arrangements for this project are presented in **Table 11.7.1** overleaf.

Table 11.7.1 Validation Methodology

AEC ID	Contamination Risk	Validation Methodology
AEC01	Friable ACM in Fill Soils	1 x 500 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 500 mL soil sample per 25 m^2 of excavation footprint. Photographic record of excavation footprint.
AEC01 **AEC02** **AEC03** **AEC05**	Non-friable ACM in or on Fill Soils	<u>Treated soils:</u> Visual inspection of treated materials prior to stockpiling in < 30 m^3. 1 x 10L sample per 30 m^3 of treated material, screened for fragments of ACM > 7mm and a subsequent 500 mL sample for quantitative asbestos analysis. <u>Excavation footprints:</u> Visual inspection of excavation footprint to confirm removal of fill. Following removal: 1 x 500 mL soil sample per 10 linear metres of excavation wall, with a minimum of 1 per wall and one 500 mL soil sample per 25 m^2 of excavation footprint. Photographic record of excavation. A spatial survey must be undertaken by a certified surveyor following beneficial re-use of soil materials within the placement area to confirm suitable depth of cover has been achieved (> 2 m).
Potential New or Unexpected Finds		
-	Direct Contact Risks in Soil (*if Identified)*	1 x 250 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 25 m^2 of excavation footprint. Photographic record of excavation footprint.
-	Ecological Risks in Soil (only) (*if identified*)	1 x 250 mL soil sample per 10 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 100 m^2 of excavation footprint. Photographic record of excavation footprint. A spatial survey must be undertaken by a certified surveyor following beneficial re-use of soil materials within the placement area.
-	Aesthetic Risks (*if identified*)	Photographic record of former aesthetic risk footprint.
-	Imported Fill (VENM/ENM)	Formal review of the waste classification report to be undertaken by the environmental consultant engaged followed by visual inspection on receipt of material to site OR 1 soil sample per 500 tonnes of imported material (minimum 3 samples) submitted for analysis of Asbestos (Bulk ID), Metals (8), BTEX, TRH, PAH, OCP and PCB.

The quantity and movement of all waste materials excavated and removed offsite with be tracked by the remedial contractor. All waste disposal dockets issued by the suitably licensed waste receiving facility will be retained by the remedial contractor for reconciliation against the material tracking records, and for inclusion in the validation report. This will demonstrate that the waste was appropriately disposed to licensed facilities.

If visual or olfactory observations indicated a potential for soil contamination to be present, then collection of additional validation samples will be considered.

11.7.3 Validation Sampling Methodology

Grab soil samples will be collected at each required sampling point directly from the base and walls of the excavation. Depending on the depth of the excavation footprint, an excavator may be required to obtain samples. In these instances, samples will be collected from soils in the centre of the excavator bucket, to avoid cross contamination from the excavator bucket.

Sampling will be guided by a combination of visual evidence (e.g. visible ACM, staining, etc), olfactory evidence (hydrocarbon odours) and field analytical instrumentation (e.g. portable PID soil headspace screening) where applicable.

Observations of the materials encountered during sampling will be recorded on the relevant field observation log with photographic record.

11.7.4 Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the AEC, the number of samples collected and the depth/interval the sample was collected from, e.g. a sample collected from AEC01 from the excavation footprint base, would be identified as AEC01-Base.

Project samples will be stored in laboratory prepared glass jars or zip-lock bags (if collected for asbestos).

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

- EGA project identification number
- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)
- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

11.7.5 Soil Vapour Screening

Where the contaminants of potential concern include volatiles, project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on a field sampling point log and presented in test-pit logs.

11.7.6 Decontamination

In the unlikely event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

11.7.7 Laboratory Selection

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

11.7.8 Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;

- Headspace screening results (where available); and
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on the site history, EGA has adopted the laboratory analytical schedule for the supplementary contamination assessment and the validation sampling. Project specific information is presented in **Table 11.7.2.**

Table 11.7.2 Laboratory Analytical Schedule (Validation Sampling)

AEC ID	Area of Environmental Concern	Analytical Schedule	Sample Quantity
AEC01	Friable and Non-Friable Asbestos Impacted Fill Soils	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC02	Non-Friable Asbestos Impacted Fill Soils	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC03	Non-Friable Asbestos Impacted Fill Soils	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC04	Underground Storage or Petroleum-Based Product Onsite	*TBC Following receipt of the supplementary assessment*	Per **Section 11.7.2**
AEC05	Soil Materials Beneath Existing Building Footprints (unassessed)	*TBC Following receipt of the supplementary assessment*	Per **Section 11.7.2**
	Soil Materials Beneath Existing Building Footprints	Quantitative Asbestos (0.001%)	Per **Section 11.7.2**
AEC06	Deep Uncontrolled Filling Adjacent to Southern Portion of the Site	*TBC Following receipt of the supplementary assessment*	Per **Section 11.7.2**
AEC07	Adjacent Industrial Land Use to the North and North-East of the Site	*TBC Following receipt of the supplementary assessment*	Per **Section 11.7.2**
Imported Fill – VENM	Imported soils (if required)	In absence of a VENM validation report, each sample will be subjected to TRH, BTEX, PAH, 8 metals, OCP and asbestos.	Per **Section 11.7.2**
Imported Fill – ENM	Imported soils (if required)	In absence of an ENM validation report, each sample will be subjected to TRH, BTEX, PAH, 8 metals, EC, pH, foreign materials and asbestos.	Per **Section 11.7.2**

11.7.9 Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented below in **Table 11.7.3** and **Table 11.7.4**

Table 11.7.3 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (Eurofins - Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	AS4964:2004	Absence / presence
Asbestos	No limit	Inhouse Method	0.001% w/w
BTEX and TPH C_6-C_{10}	14 days	NEPM Schedule B3	0.1-20
Metals	6 months	USEPA 6010, 6020	0.1-5
TPH >C_{10}-C_{40}	14 days	NEPM Schedule B3	20-100
OCP/OPP	14 days	USEPA 8081	0.2
PAH	14 days	USEPA 8270	0.1-0.5
VOC	14 days	USEPA 8260	0.1-0.5

Table 11.7.4 Laboratory Holding Times, Analytical Methods, and Limits of Reporting (ALS - Soil).

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
Asbestos	No limit	PLM/Disp. Stain.	Absence / presence
Asbestos	No limit	WA-DER	0.001% w/w
BTEX and TPH C_6-C_{10}	14 days	USEPA 8260	0.2-0.5
Metals	6 months	USEPA 200.8/3050/6010B	0.1-3
TPH >C_{10}-C_{40}	14 days	USEPA 8270	20-100
OCP/OPP	14 days	USEPA 8270	0.1-0.2/0.2-1
PAH	14 days	USEPA 8270	0.1
VOC	14 days	USEPA 8260	0.2-0.5

11.8 Validation Sampling and Testing programs

11.8.1 Classification of Waste to be Disposed Off-site

Removal of materials from site for recycling and/or disposal, will be undertaken with reference to the relevant provisions of the Protection of the Environment Operations Act (1997) and NSW EPA Waste Classification Guidelines (2014).

If waste classification is required for site material, the following is required (as a minimum):

- Waste classification documentation;
- Material source and description;
- Sampling density, pattern, COPCs;
- Result summary, including appropriate table with comparison to acceptance criteria; and
- Waste classification.

If offsite disposal is required for site material, the following is required (as a minimum):

- Source location;
- Estimated volume (based on excavation size;
- Actual volume of disposal;
- Waste classification;
- Transporter;
- Final destination, POEO license;
- Reconciliation of waste dockets with actual disposal volume; and
- Reconciliation of actual disposal volume and the estimated volume of disposal (based on excavation size.

The remediation contractor will maintain detailed records of materials removed from the site, including date/time of removal, quantities of materials, transport company details and vehicle registration details.

The remediation contractor will retain records verifying lawful disposal of the materials, including date / time the waste left site, approximate volume per load, the classified of the waste contained in each individual load, transport vehicle registration details, weighbridge / tipping dockets with receipt dates / times and tipped waste classification from the waste receiving facility.

Material placed onsite (stockpiles or moved to other location) must be tracked so that the source of material can be identified should unexpected finds be encountered.

11.8.2 Former Building Footprints and Hardstand Areas

Following demolition of structures or hardstand areas the residual soil surface will be subject to a visual inspection by a suitable qualified and experienced environmental consultant for contamination indicators such as foreign materials, potential asbestos containing materials, staining or odours.

The following methodology will be utilised for the visual clearance of residual soil surfaces:

- Subject area and immediate surroundings visually inspected for suspected asbestos containing materials, comprising systematic grid-based walkover with 2 m lane spacing; and
- Subject area photographed.

11.8.3 Existing soil stockpiles

Following relocation of existing stockpiled soils to the designated asbestos treatment area, materials within the former stockpile footprint to be removed 100 mm bsgl. Visual asbestos clearance inspection reports of the stockpile footprint and transit routes following relocation or load out of stockpiles to be prepared by the supervising environmental consultant in line with the methodology below:

- Subject area and immediate surroundings visually inspected for suspected asbestos containing materials, comprising a systematic grid-based walkover with 2 m lane spacing;
- Subject area photographed; and
- Transit route visually inspected for suspected asbestos containing materials comprising systematic grid-based walkover with 2m lane spacing.

11.8.4 Excavations in Asbestos Remediated Areas

Following the completion of asbestos removal works, the following methodology will be utilised for the visual clearance of residual soil surfaces within the resultant excavation:

- Subject area and immediate surroundings visually inspected for suspected asbestos containing materials, comprising a systematic grid-based walkover with 2 m lane spacing;
- Subject area photographed; and
- Transit route visually inspected for suspected asbestos containing materials comprising a systematic grid-based walkover with 2m lane spacing.

A systematic validation sampling pattern will be carried out, with one soil sample (500ml) collected from the floor (per 25 m^2) and one soil sample (500ml) collected from each wall (per 10 linear meters) of the remedial excavation footprints. All samples submitted to a Nata Accredited laboratory for Quantitative Asbestos (0.001%) analysis.

11.8.5 Treated Asbestos Impacted Soil

Treated materials will be subject to a visual inspection by the supervising environmental consultant following completion of two passes of raking and picking, only once all visible fibre cement fragments have been removed will soils be re-stockpiled for the purpose of validation sampling.

Following treatment and removal of all visible asbestos fibre cement fragments, the soil materials will then be stockpiled in 30 m^3 volumes and re-assessed against the adopted site assessment criteria. One 10L soil sample per 30 m^3 of treated material will be collected and screened for fragments of ACM > 7mm in addition to a subsequent 500 mL sample submitted to a Nata Accredited laboratory for Quantitative Asbestos (0.001%) analysis.

Until the receipt of validation results confirming suitability for re-use within the site, stockpiled treated materials are not to be mix or consolidated.

In the event that soil materials exceed the adopted site assessment criteria, a waste classification based on NSW EPA Waste Classification Guidelines 2014 must be prepared for disposal offsite to a licensed waste receiving facility in line with **section 12.7.4**.

11.8.6 Buried Asbestos Conduits

Following the removal of redundant asbestos fibre cement conduits, the residual soil surface in the former location of the pipes will be subject to a systematic visual inspection by a competent person. Visual clearance inspections will follow the below protocol:

- Subject area and immediate surroundings visually inspected for suspected asbestos containing materials, comprising a systematic grid-based walkover with 2 m lane spacing;
- Subject area photographed; and

- Transit route visually inspected for suspected asbestos containing materials comprising a systematic grid-based walkover with 2m lane spacing.

11.8.7 Excavations for Pits and USTs

Redundant septic tanks if encountered will be exposed by careful excavation and examined for potential leaks and general condition. Following removal validation samples will be collected from the residual soil surfaces of the resultant excavation, one 250 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 25 m^2 of excavation footprint. Sample submitted to a Nata Accredited laboratory for analysis of Metals, PAH, BTEX, TRH, Asbestos, OCPs, E.Coli and Thermotolerant Coliforms.

Photographic record of excavation footprint must be maintained.

Underground storage tanks if encountered will be exposed by careful excavation and examined for potential leaks and general condition. Following excavation surrounding the UST to expose the tank structure, visual inspection for leaks and assessment of the tank integrity. Following removal of the tank, visual inspection of excavation footprint for leaks, staining or odours.

Following removal of impacted soil materials surrounding the tank, one 250 mL soil sample per 5 linear metres of excavation wall, with a minimum of 1 per wall and one 250 mL soil sample per 25 m^2 of excavation footprint. Following removal of fuel lines (if identified), one 250 mL jar sample per 5 lineal meters. Sample submitted to a Nata Accredited laboratory for analysis of Heavy Metals, TRH, PAH, VOC/SVOC, Phenols.

Photographic record of excavation.

If visual or analytical evidence of leaks is observed in the tank and / or tank pit then further groundwater monitoring may be required as advised by an Environmental Consultant.

11.8.8 Unexpected Finds

Site work may find contamination and buried materials not anticipated and addressed by the conceptual Site Model (CSM), which are referred to as Unexpected Finds. In the event that unexpected finds are encountered and remediated, validation sampling will be guided by the seven-step data quality objectives laid out in section **11.1** to **11.7** above.

12 REPORTING

12.1 Interim Reporting

The Environmental Consultant will be required to undertake various types of reporting throughout the remediation and bulk earthworks program. These types of reporting include:

- Site inspection reports;
- Interim Completion Reports at the end of specified remediation tasks completed for a particular Development Stage; and
- Interim validation reports prepared at the completion of remediation and bulk earthworks for a particular Development Stage.

12.1.1 Site Inspection Report

Site inspection reports will be prepared during remediation and bulk earthworks to document details on the following:

- Condition of the soils encountered during bulk earthworks;
- Excavation procedures used during works;
- Types of machinery used to transport soils within site;
- Condition of stockpiled soils;
- Condition of geofabric layers and their fixtures;
- Document environmental procedures, their maintenance and efficacy;
- Copies of field records and photos for works completed;
- Documentation of the materials tracking procedures employed by the civil contractor;
- Documentation of the variation and thickness of fill types throughout the site;
- Monitor transport of materials by a contractor licensed to transport the waste; and
- Monitor transit routes and assessment of cross contamination risks.

12.1.2 Interim Completion Report

Interim completion reports will be prepared at the completion of remediation task to document details on the following:

- Condition of the soils encountered during remediation;
- Excavation procedures used during works;
- The depth and laterally extent of the excavations completed;
- Volumes of soil generated during remediation;
- Types of machinery used to transport soils within site;
- Condition of stockpiled soils;
- Condition of geofabric layers and their fixtures;
- Document environmental procedures, their maintenance and efficacy;
- Copies of field records and photos for works completed;
- Documentation of the materials tracking procedures employed by the civil contractor;
- Documentation of the variation and thickness of fill types throughout the site;
- Transport of materials by a contractor licensed to transport the waste;
- Transit routes and assessment of cross contamination risks;
- Results of airborne asbestos monitoring completed during the works undertaken;
- Detailed description of the procedures used for clearance inspections;
- Detailed description of the procedures used during validation sampling;
- Comparison of validation results against the remediation acceptance criteria;
- An assessment of field and laboratory quality assurance / quality control data; and
- Information on any ongoing management or investigation requirements.

12.1.3 Interim Validation Report

At the completion of remediation works for a given development stage, an interim validation report will be prepared with reference to the relevant sections of NSW EPA 2020, 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'.

The site validation report must include:

- Document control;
- An executive summary;
- The scope of reporting work undertaken;
- Site identification details;
- A summary of site history;
- A summary of site condition and the surrounding environment;
- A summary of geology and hydrogeology;
- Conceptual site model;
- Validation criteria;
- Information on the remediation works undertaken for the 5 remedial phases outlined in section 10;
- Summary of the details provided as part of the interim completion and site inspection reporting;
- Import documentation;
- The results of field and laboratory work;
- An assessment of field and laboratory quality assurance / quality control data;
- Waste management (waste classification reports, tipping dockets, and review of import fill (if applicable);
- A discussion on site validation;
- Materials tracking documentation;
- Details of earthworks completed for the particular development stage;
- Final survey plans of the particular development stage;
- Information on ongoing site monitoring requirements (if any); and
- Conclusions and recommendations.

12.2 Final Site Validation Report

At the completion of remediation works for the site and following the final site surface inspection, a validation report will be prepared for the project. This report will bring together the information included as part of the Interim validation reporting prepared for the individual development stages with the addition of the details on the final site surface inspection.

13 SITE MANAGEMENT PLAN

The following site management plan will apply during undertaking of the remediation tasks.

13.1 Soil and Stormwater Management

13.1.1 Site Access/Egress

Vehicle access and egress to the site will be stabilised to prevent tracking of sediment onto roads and footpaths. Soil, mud and other similar materials will be removed from the roadway adjacent the access/egress point by sweeping, shovelling or a means other than washing, on a daily basis, or as required.

Trucks will be loaded adjacent to the remediation excavation (where practical). Spills of excavated soil will be scraped / swept up and combined with the soil being disposed offsite.

Soil and sediment will be broomed or washed off vehicle/plant tyres and tracks, prior to vehicles/plant leaving the remediation works zone. This soil and sediment will be scraped / swept up and managed onsite or disposed of, depending on its contamination status.

A site-specific sediment and erosion control plan will be prepared and maintained by the remediation contractor, to suit staging of the remediation works. Erosion and sediment control measures will be maintained in a functional condition. Sediment laden stormwater runoff will be controlled using measures outlined in Landcom 2004, '*Managing Urban Stormwater - Soils and Construction*' (the Blue Book).

13.1.2 Stockpiles

Stockpiles of soil or other materials:

- Will not be placed on footpaths or nature strips, unless approved by Council;
- Will be placed away from gutters, stormwater pits and other drainage lines;
- Will be stored in a secure area and be covered if remaining on site for more than 24 hours; and
- Will generally be constructed as low elongated mounds on level surfaces.

13.1.3 Excavation Pump Out

Should excavations require pumping out, water will be analysed for total suspended solids, pH, metals and petroleum hydrocarbons. Should analytical results be less than relevant marine ecosystem groundwater investigation levels in ANZ (2018), excavation water may be discharged to stormwater. Further assessment would be required should these levels be exceeded.

EGA note that the principal contractor may have additional obligations (i.e. permitting) to fulfill prior to discharge. EGA recommend consultation with the relevant authority (local council) prior to any discharge occurring.

Should analytical results exceed ANZ (2018) criteria, other options for disposal will be considered, including:

- Discharge to sewer (with prior approval from Sydney Water with a Trade Waste Agreement); and
- Removal and offsite disposal by a liquid waste contractor.

13.1.4 Rehabilitation and Landscaping

Stabilisation of exposed areas on the site, where required, will be undertaken in a progressive manner, as stages of remediation works are completed. Stabilisation will be maintained until such time as site redevelopment works commence.

As site redevelopment works are expected to be undertaken in conjunction with remediation works, revegetation of the site is considered unlikely to be required.

13.2 Asbestos Management

For non-friable asbestos removal works, a SafeWork NSW Class A or B licensed asbestos removalist contractor must be engaged to undertake the works. Works should be supervised by a suitably qualified and experienced and experienced occupational hygienist.

For friable asbestos removal works, a SafeWork NSW Class A licensed asbestos removalist contractor must be engaged to undertake the works. Works must be supervised by a SafeWork NSW licensed asbestos assessor.

EGA note that based on the current conditions at the site, at the time of this RAP, both friable and non-friable asbestos has been identified within the site.

13.3 Regulatory Notification

A notification of intent to remove asbestos containing materials must be submitted to the regulator (SafeWork NSW) at least 5 days prior to commencing asbestos removal works.

An Asbestos Removal Control Plan is to be prepared by the asbestos removalist contractor engaged for the works.

13.4 Airborne Asbestos Monitoring

For non-friable asbestos removal works, airborne asbestos monitoring is to be undertaken by a suitably experienced occupational hygienist.

For friable asbestos removal works, airborne asbestos monitoring must be undertaken by a SafeWork NSW licensed asbestos assessor.

Airborne fibre monitoring will be implemented during all remedial works involving friable asbestos at the site, and will be carried out in accordance with SafeWork NSW (2022) *Code of Practice – How to Safely Remove Asbestos*. EGA recommend that airborne fibre monitoring be implemented during works involving non-friable asbestos within the site, this however is not explicitly required but is highly recommended by SafeWork NSW.

Portable battery-operated air monitors are to be placed within static positions approximately 1.5m above the ground surrounding the work/removal area. The air sample analysis shall be carried out by a NATA-accredited laboratory. The results of asbestos air monitoring should be provided to the Site Project Management Representative the day following the removal or handling works. Project management will display results of air monitoring on the site's safety notice board for a period of 24hr.

The following actions are to be undertaken based on the results of daily air monitoring.

Table 13.1 Airborne Asbestos Fibre Concentration Action Levels

Action Level (airborne asbestos fibres/ml)	Action
< 0.01 fibres/ml	Continue with control measures
≥ 0.01 fibres/ml **< 0.02 fibres/ml**	Review control measures, Investigate the cause, Implement new controls to prevent further release.
≥ 0.02 fibres/mL	Stop removal works,

	Notify the relevant regulator that work has ceased, Investigate the cause, Extend the isolation area and implement controls to minimise further exposure, Do not recommence work until fibre levels are at or below 0.01 fibres/ml.

13.5 Clearance Inspection and Certificates

Following the successful removal of asbestos impacted soils, the occupational hygienist or licensed asbestos assessor (as must be the case for any friable asbestos removal works) will undertake a visual inspection of the works area and provide an asbestos materials clearance report detailing that the asbestos has been successfully removed. Further in the case of friable asbestos, validation samples will be taken and analysed for quantitative asbestos per NEPM/WA DoH and will form part of the clearance report.

Clearance reports are to be included in the site validation report.

13.6 Groundwater Management

Should dewatering of the site be required, development consent may be required from the planning consent authority. Dewatering may also require approvals from the NSW Department of Planning and Infrastructure, and the NSW Department of Primary Industry – Water.

Further, should unexpected significant contamination be encountered during remediation that may affect groundwater (e.g. the presence of unknown underground storage tanks), additional groundwater assessment will be required.

13.7 Noise Control

Noise levels from the site during the project will not exceed the limits indicated in AS2436-1981.

No 'offensive noise' as defined under the Protection of the Environment Operations Act 1997 will be created during remediation works/activities.

Plant and equipment will be fitted with noise attenuation devices (e.g. mufflers on exhausts). Consideration will be given to use of reversing alarms other than the standard pulsed tonal alarms.

Vehicle access roads will be designed in such a way to minimise the need for plant and vehicles to reverse (e.g. provision of a turning circle adjacent to the remediation works zone).

13.8 Dust Control

Dust may be generated during remediation works and associated tasks. To mitigate risk of dust emissions migrating beyond the site boundary, consideration will be given to implementing the following procedures:

- Erection of dust screens around the perimeter of the site (e.g. fencing with shade cloth attached);
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering stockpiles of contaminated soil remaining on site for more than 24 hours;
- Keeping excavation surfaces moist;
- Wetting down of placed fill material during spreading;
- Sweeping of hardstand surfaces;
- Minimising soil disturbance works during windy days; and

- Retaining stabilised site access/egress points for vehicles.

13.9 Odour Control

Generation of significant odours during the remediation works is considered to be unlikely.

If odours are generated, odours will be monitored at the site boundary. Should unacceptable odours be detected at the site boundary, consideration will be given to implementing the following procedures:

- Use of appropriate covering techniques such as plastic sheeting to cover excavation faces or stockpiles;
- Use of fine mist sprays (which may incorporate deodorizing agents);
- Use of hydrocarbon mitigating agents on impacted areas/materials; and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

A record of unacceptable odours and corrective/preventative action taken, will be maintained by the remediation contractor.

13.10 Traffic Management

Haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site will be selected by the remediation contractor and will meet the following objectives:

- Compliance with all traffic road rules;
- Minimisation of noise, vibration and odour to adjacent premises; and
- Utilisation of state roads and minimisation of use of local roads.

The remediation contractor will ensure that site vehicles:

- Conduct deliveries of soil, materials, equipment or machinery during the hours of remediation work identified in **Section 13.15**;
- Securely cover all loads to prevent dust or odour emissions during transportation;
- Exit the site in a forward direction; and
- Do not track soil, mud or sediment onto the road.

13.11 Vibration Management

Vibration emissions during remediation works will be controlled to mitigate risk of potential damage to assets on adjacent properties, and to mitigate unreasonable loss of amenity to nearby residents.

13.12 Work Health and Safety

13.12.1 Safe Work Method Statement

Each contractor and sub-contractor undertaking remediation works, or working within a remediation works zone, will prepare a project specific safe work method statement (SWMS), which will include, but not be limited to:

- The tasks to be undertaken;
- Hazards identified for each of the tasks to be undertaken;
- An assessment of risk for each hazard, considering likelihood and consequence; and
- Control measures to eliminate or mitigate risks associated with each identified hazard.

13.12.2 Personal Protective Equipment

The following minimum personal protective equipment (PPE) should be worn by all persons working in or visiting the remediation works zone:

- Long sleeves and long pants;
- High visibility vests (or clothing);
- Safety boots;
- Hard hats;
- Gloves; and
- Eye protection (e.g. safety glasses).

Additional PPE may be required in accordance with task specific control measures in SWMS (refer **Section 13.12.1**) for asbestos handling and removal works.

The following minimum personal protective equipment (PPE) are be worn by any persons entering a non-friable asbestos impacted remediation works zone:

- Disposable coveralls;
- Minimum P2 respirator;
- Disposable boot covers; and
- Disposable gloves.

Should friable asbestos be identified during the works, the following minimum PPE are to be worn by any persons entering a friable asbestos impacted remediation works zone:

- Disposable coveralls;
- Minimum P3 half-face respirator (Higher protection may be required during works. Refer to the licensed asbestos assessor on-site for further details);
- Disposable boot covers; and
- Disposable gloves.

Additionally, a 3 stage (minimum) decontamination unit must be present at the egress point to the friable asbestos works area and used by all personnel entering and exiting the area.

13.12.3 Decontamination of Personnel, Plant and Equipment

Personnel undertaking remediation tasks, or entering the remediation works zone, will be required to decontaminate upon exiting the remediation works zone. Decontamination of plant and equipment used to remediate will also need to be decontaminated upon exiting the remediation work zones. Decontamination procedures will include:

- Removal of all disposable PPE;
- Cleaning down of protective footwear (including removal of soil from the soles);
- Washing of hands and exposed dermal areas; and
- Decontamination of plant and equipment (as applicable).

13.13 Site Signage

A sign will be posted on the boundary of the site, adjacent to the site access point, which will include 24-hour contact details of the remediation contractor and appropriate notification of asbestos contamination/remediation works (in progress).

13.14 Site Security

Site security will be maintained throughout the duration of the remediation works, with appropriate boundary fencing and gate locks. Other security measures may be implemented, if the need arises.

13.15 Site Hours of Operation

Remediation works will be undertaken on Monday to Friday between the hours of 7:00am to 5:00pm, and Saturday between the hours of 8:00am and 1:00pm.

Remediation works will not be undertaken outside the hours stated above, or on Sundays or public holidays.

13.16 Community Relations and Complaints

Owners, occupants and tenants of properties adjoining the site and across the road from the site, will be provided with notification of remediation works, at least two days prior to those works commencing.

Personnel undertaking remediation works on the site, will direct all third-party communications and/or complaints to the Project Manager. The Project Manager will arrange for the communication/complaint to be assessed, a response prepared, corrective/preventative actions implemented (if necessary).

A register will be maintained on site for the recording of communications / complaints from third parties, including but not limited to, local residents and local businesses.

13.17 Emergency Preparedness

An emergency assembly point will be established at the site egress point. This point will be communicated to all site workers and visitors, during relevant site induction processes.

In the event of an emergency, site workers and visitors will assemble here and await further instructions from the site supervisor, project manager or emergency services.

Spill control kits and fire extinguishers will be located on site, as and where required.

Contact details to be used in the event of an emergency, are presented in **Section 13.18**.

13.18 Register of Contacts

A register of contacts for the project is presented in **Table 13.18.1** below.

Table 13.18.1 Register of Contacts

Project Role	Person	Organisation	Contact
Emergency Services	-	Fire / Police / Ambulance	000
Site Owner	TBC	Mirvac Residential (NSW) Developments Pty Ltd	TBC
Project Manager	Nibraas Ahmad	Mirvac Residential (NSW) Developments Pty Ltd	0406 006 792
Planning Consent Authority	-	City of Canterbury-Bankstown	9707 9000
WHS Regulatory Authority	-	SafeWork NSW	131 050
Environmental Regulatory Authority	-	NSW EPA	131 500
Remediation Contractor	TBC	TBC	TBC
Environmental Consultant	Steven Wallace	Environmental Group Australia	0434 215 998

13.19 Environmental Consultant Site Supervision

Full time supervision of bulk earthworks will be required in order to maintain detailed records on the following:

- Condition of the soils encountered during bulk earthworks;
- Excavation procedures used during works;
- Types of machinery used to transport soils within site;
- Condition of stockpiled soils;
- Condition of geofabric layers and their fixtures;
- Document environmental procedures, their maintenance and efficacy;
- Copies of field records and photos for works completed;
- Documentation of the materials tracking procedures employed by the civil contractor;
- Documentation of the variation and thickness of fill types throughout the site;
- Monitor transport of materials by a contractor licensed to transport the waste; and
- Monitor transit routes and assessment of cross contamination risks.

13.20 Interim Site Management Plan

Prior to the implementation of the remedial action plan, the following site management activities will be enforced to reduce the contamination risk to human health and the environment:

- Site Isolation:
  - Site access and egress will be limited to essential works to prevent the tracking of contaminants outside of the site boundaries.
  - Appropriate boundary fencing with locked gates will be installed (if not already present), regularly maintained and remained locked when site is not in use.
  - Signage will be posted on the boundary of the site, adjacent to the site access point, which will include 'keep out, asbestos contamination' (or similar).
- Safe Work Method Statement:
  - Each contractor and sub-contractor gaining access to the site, will prepare a project specific safe work method statement (SWMS), which will include, but not be limited to:
    - The tasks to be undertaken;
    - Hazards identified for each of the tasks to be undertaken;
    - An assessment of risk for each hazard, considering likelihood and consequence; and
    - Control measures to eliminate or mitigate risks associated with each identified hazard.
- Personal Protective Equipment:
  - The following minimum personal protective equipment (PPE) should be worn by all persons working in or visiting the remediation works zone:
    - Hard hat;
    - Long sleeves and long pants;
    - High visibility vest (clothing);
    - Safety boots;
    - Gloves;
    - Eye protection (safety glasses); and
    - Respiratory protection (Only within asbestos impacted remediation areas).
- Decontamination of Personnel equipment:
  - Cleaning down of protective footwear (including removal of soil from the soles); and
  - Washing of hands.

14 CONCLUSIONS

Based on the information presented in the historical contamination assessment reports, EGA concludes that the remedial goal can be achieved, and the site made suitable for the proposed land use setting, subject to:

- Implementation of the strategies, methodologies and measures set out in this remedial action plan;
- Should newly identified unacceptable land contamination risks be identified during the supplementary assessment and remediation works, a revision to this RAP may be required. The revision should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, a waste classification for those soils should be prepared by a suitably experienced environmental consultant;
- Future remedial works should be monitored and validated by a suitably experienced environmental consultant; and
- Following the completion of the remediation and validation work, the environmental consultant needs to prepare a site remediation and validation report that documents both the remediation and validation work as required by the EPA (2020) reporting guidelines.

This report must be read in conjunction with the limitations set out in **Section 15**.

15 STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Sydney Environmental Group Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, EGA reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to EGA's engagement. The report must not be used for any purpose other than the purpose specified at the time EGA was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual EGA consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, EGA reserves the right to review and amend this report.

16 REFERENCES

Coffey (Coffey 2011), 'Phase 2 Environmental Site Assessment – Student Residence Development University of Western Sydney, Bankstown Campus', dated 25 August 2011, Ref: GEOTLCOV24163AG-AB;

Noel Arnold and Associates (NAA 2011), 'Soil Contamination Investigation, University of Western Sydney – Bankstown Campus Bullecourt Avenue, Milperra NSW', dated October 2011, Ref: SJ0085:95458;

Environmental Investigation Services (EIS 2016), 'Preliminary Contamination Screening and Waste Classification, Proposed Oval Facilities, UWS Bankstown Campus, 2 Bullecourt Avenue, Milperra' dated 7 April 2016, no report ref provided;

JBS&G (JBS&G 2018), 'Phase 1 Environmental Assessment Report, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;

Alliance Geotechnical (AG 2020), 'Detailed Site Investigation, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-1-1;

Alliance Geotechnical (AG 2022), 'Remedial Action Plan, Western Sydney University – Milperra Campus, Bullecourt Avenue, Milperra NSW', dated 30 January 2020, Ref: 9996-ER-2-1; and

Sydney Environmental Group (2024), 'Supplementary Detailed Site Investigation, Western Sydney University – Milperra Campus, Milperra NSW', dated 22 February 2024, Ref: 2300-DSI-01-220224.v1f.

ANZG 2018, '*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*', 2018;

Landcom 2004, '*Managing Urban Stormwater - Soils and Construction*' (the Blue Book).

National Environment Protection Council (NEPC), '*Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013*';

National Environment Protection Council (NEPC), '*Schedule B(2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013*';

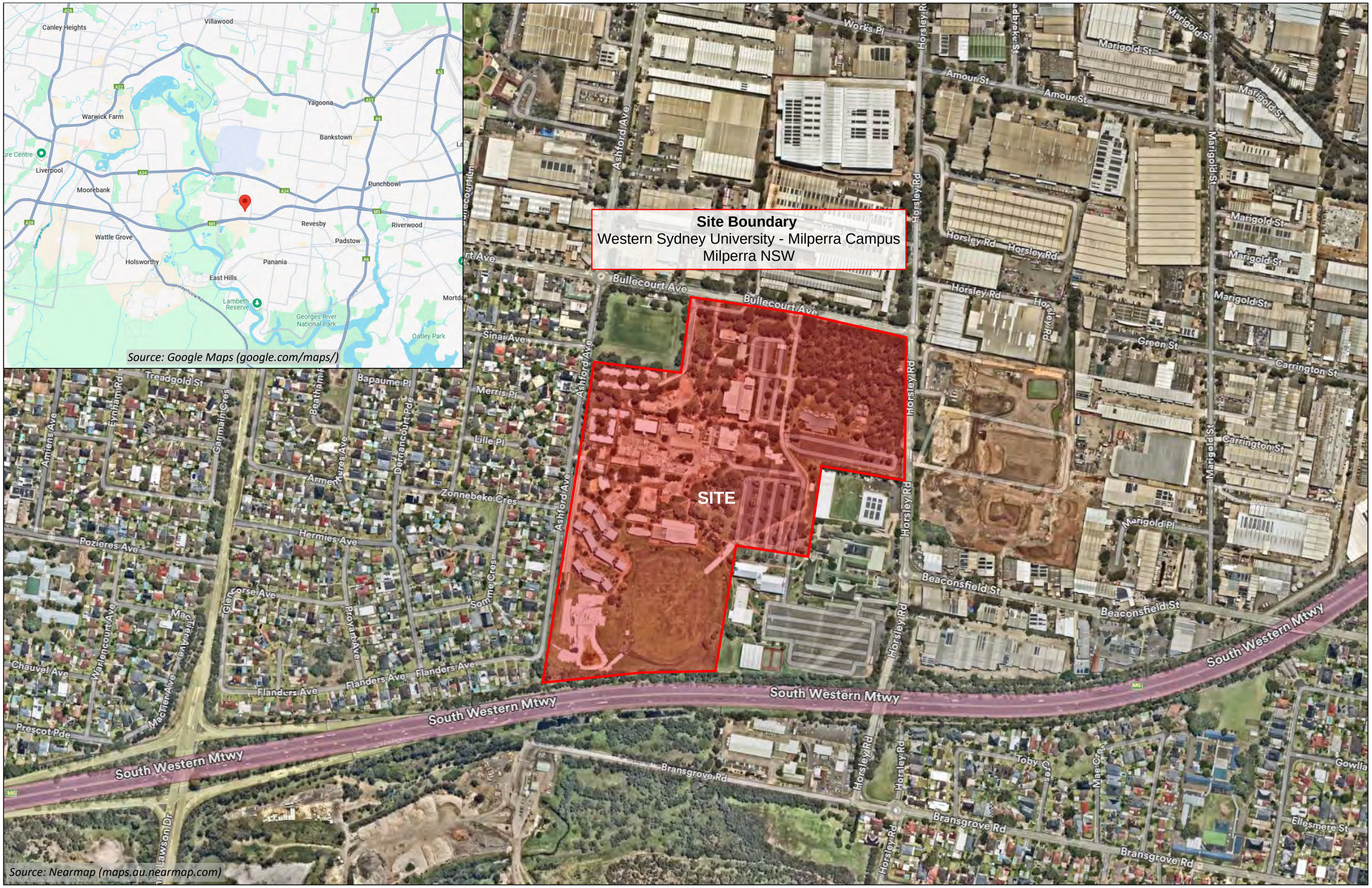
NSW EPA 2022, '*Sampling Design Guidelines for Contaminated Land*';

NSW EPA 2017, '*Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd edition)*';

NSW EPA 2020, '*Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*'; and

WA DOH 2021, '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'

FIGURES



Scale :	150 m	Site Locality		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	1
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f

LEGEND

- Site Boundary
- **AEC01** - Friable Asbestos Impacted Soils (EBH1)
- **AEC01 -** Non-friable Asbestos Impacted Soils
- **AEC01a** - Lead, Cadmium and Zinc Impacted Soils
- **AEC02** - Non-Friable Asbestos Impacted Soils
- **AEC03** - Asbestos Impacted Soils and Potential Asbestos Impacted Soil
- **PAEC04** - Former Underground Storage Tank
- **AEC05** - Non-friable asbestos impacted shallow fill soils
- Further Sampling Required in-line with updated RAP
- Environmental Conservation Zone

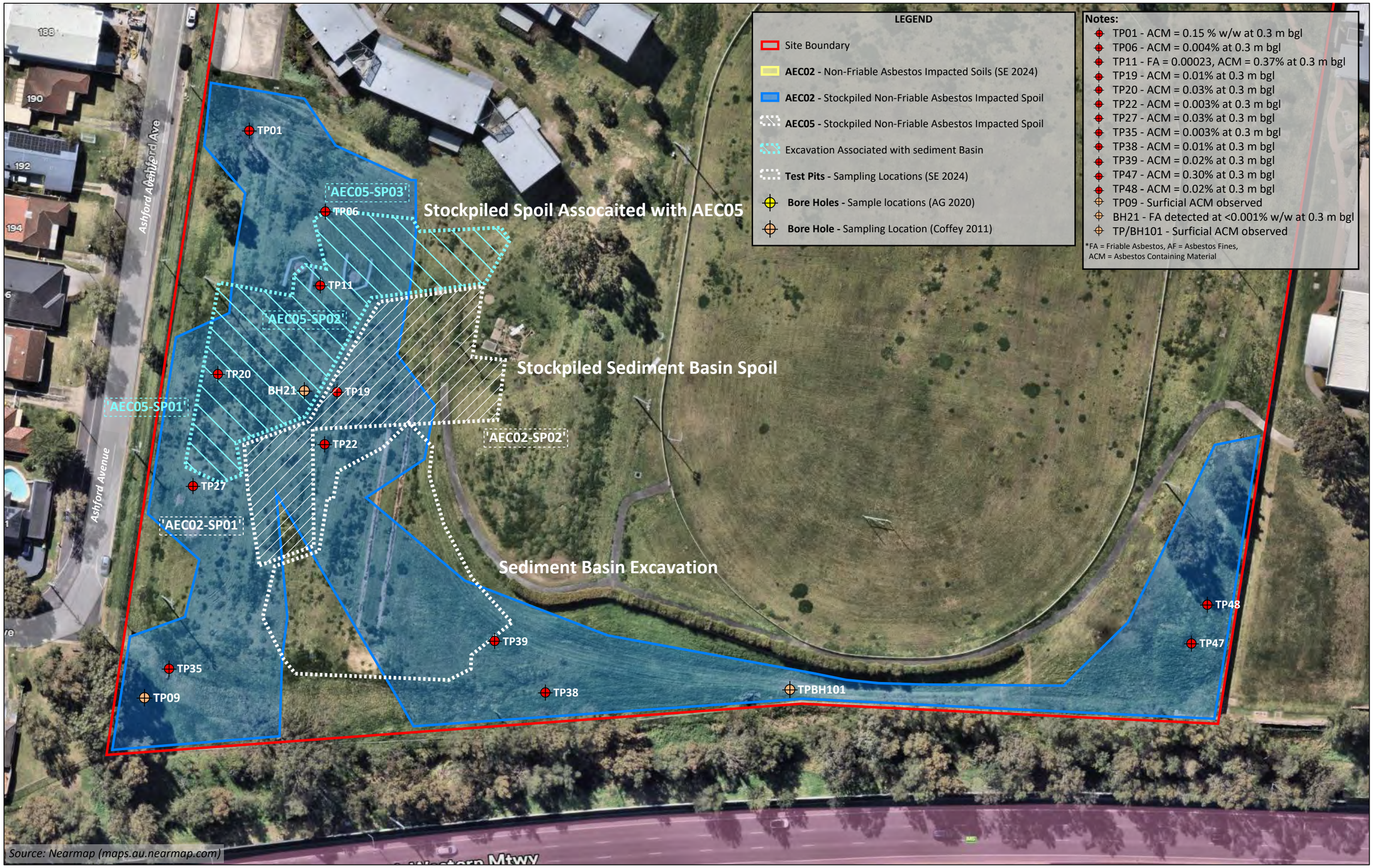
Horsley Rd
Mount St Joseph Catholic College, Horsley Rd
Horsley Rd After Beaconsfield St
South Western Mtwy
Brransgrove Rd
Bullecourt Ave
Western Sydney University, Bullecourt Av
Ashford Village And Bp Service Station
Ashford Ave

Source: Nearmap (maps.au.nearmap.com)

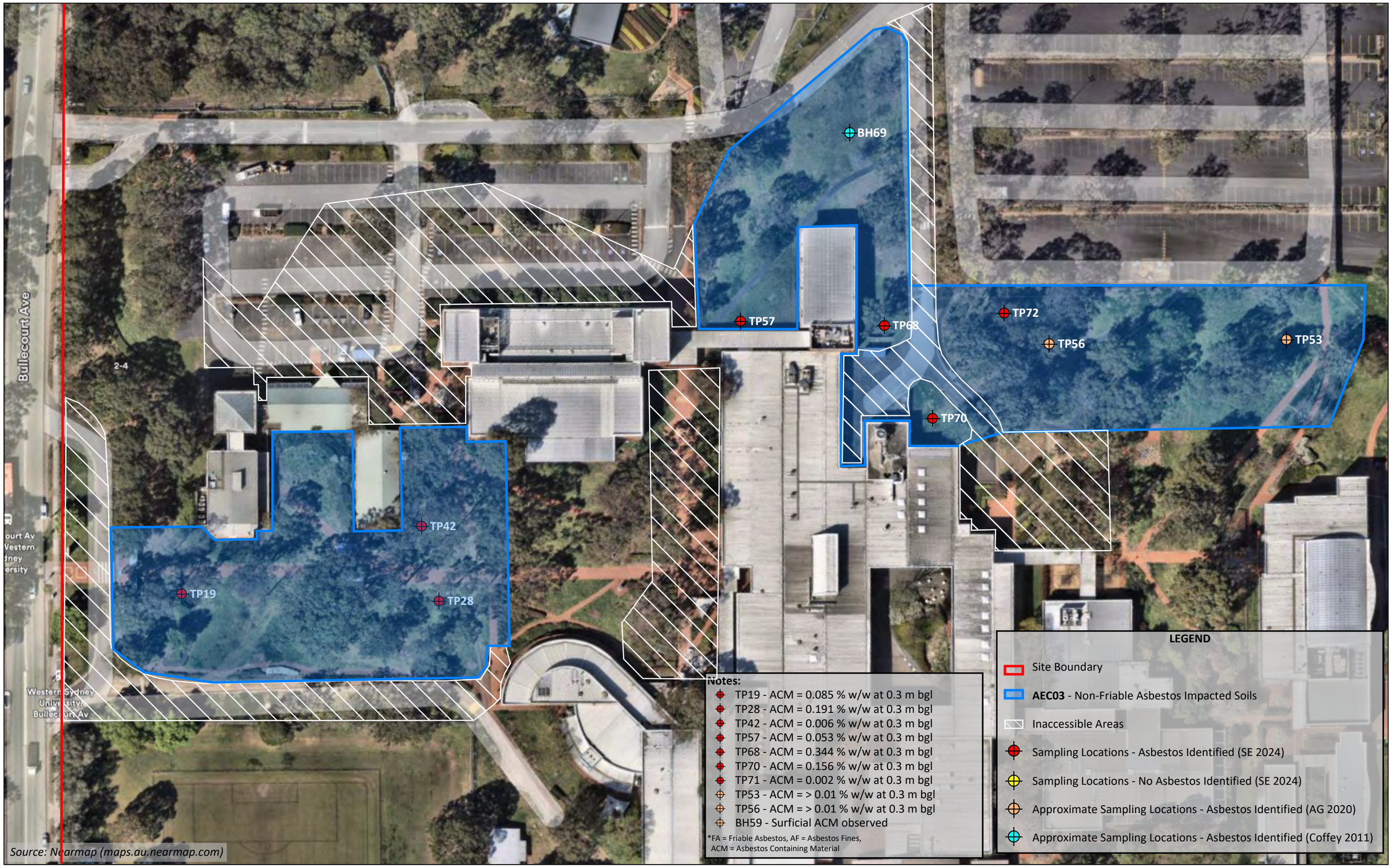
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Client Name:	Mirvac Pty Ltd	N	Figure Number:	2
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-ARAP-01-300924.v1f



Scale :	15 m	Approximate Remedial Extents - AEC01	
Client Name:	Mirvac Pty Ltd	Figure Number:	3
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



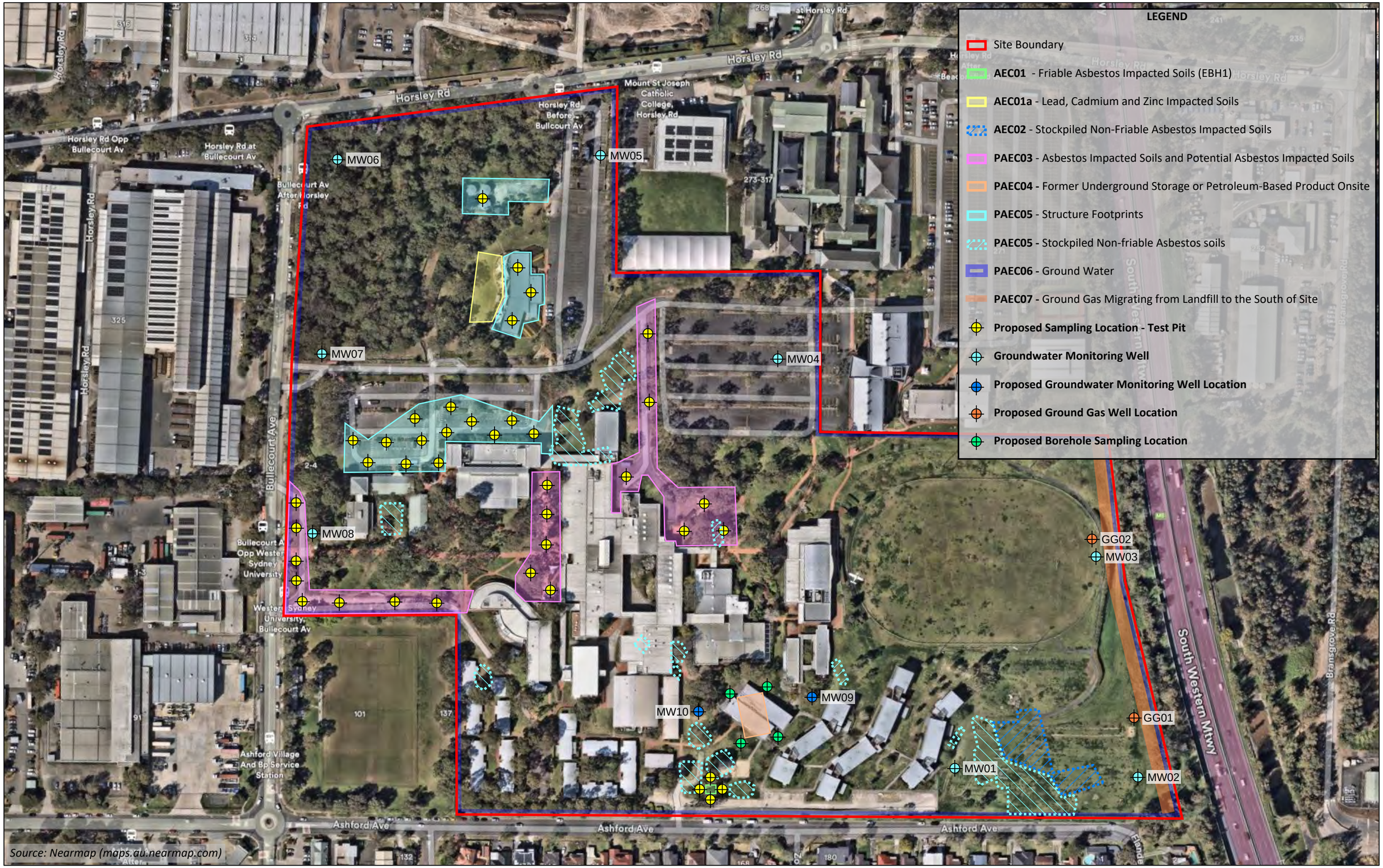
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Client Name:	Mirvac Pty Ltd	N	Figure Number:	4
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f



Scale :	25 m	Approximate Remedial Extents - AEC03	
Client Name:	Mirvac Pty Ltd	Figure Number:	5
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f

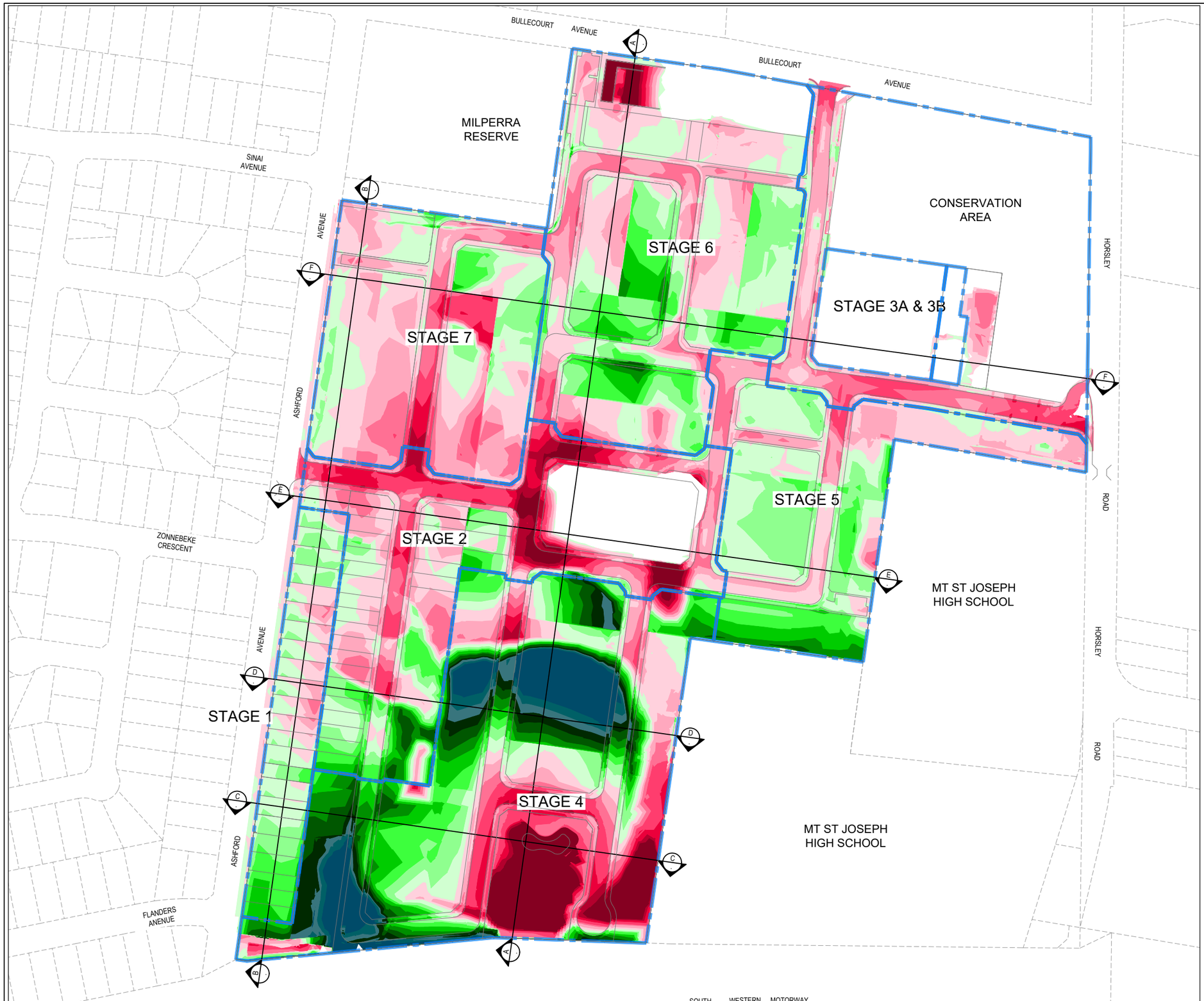


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Client Name:	Mirvac Pty Ltd	Figure Number:	6
Project Name:	Remedial Action Plan	Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW	Report Number:	2300-RAP-01-300924.v1f



Scale :	65 m	Proposed Supplementary Sampling Locations		
Client Name:	Mirvac Pty Ltd	N	Figure Number:	7
Project Name:	Remedial Action Plan		Figure Date:	7 August 2025
Project Location:	Western Sydney University – Milperra Campus, Milperra NSW		Report Number:	2300-RAP-01-300924.v1f

APPENDIX A



CUT AND FILL LEGEND		
DEPTH RANGE (m)		COLOUR
>1.8m CUT		
-1.8	-1.5	
-1.5	-1.2	
-1.2	-0.9	
-0.9	-0.6	
-0.6	-0.3	
-0.3	0.0	
0.0	0.3	
0.3	0.6	
0.6	0.9	
0.9	1.2	
1.2	1.5	
1.5	1.8	
1.8	2.1	
2.1	2.4	
2.4	2.7	
>2.7m FILL		

APPROXIMATE EARTHWORKS VOLUMES:

CUT - 55,502m³
FILL - 60,584m³

BALANCE - 5,082m³ OF FILL

* THIS ESTIMATE IS BASED ON POST DEMOLITION EXISTING SURFACE TO BOXING DESIGN SURFACE

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works

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Drawn	G.N.
Checked	-
Date	-
Approved	-
Reg. No.	-
Date	-
DA Number	DA1000

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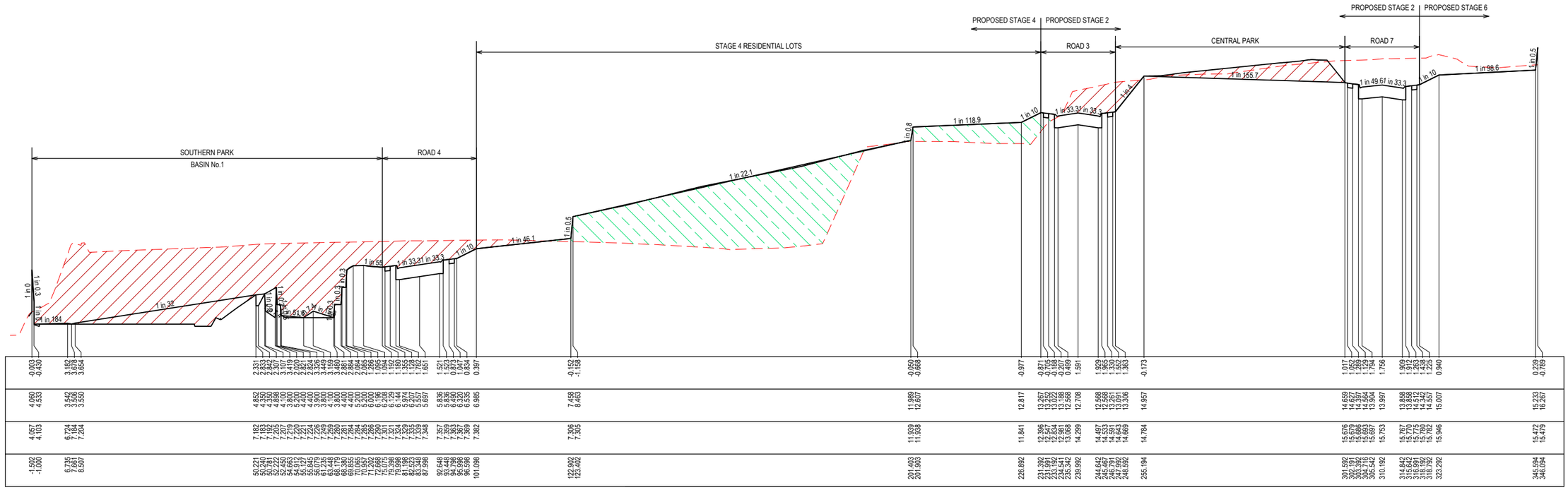
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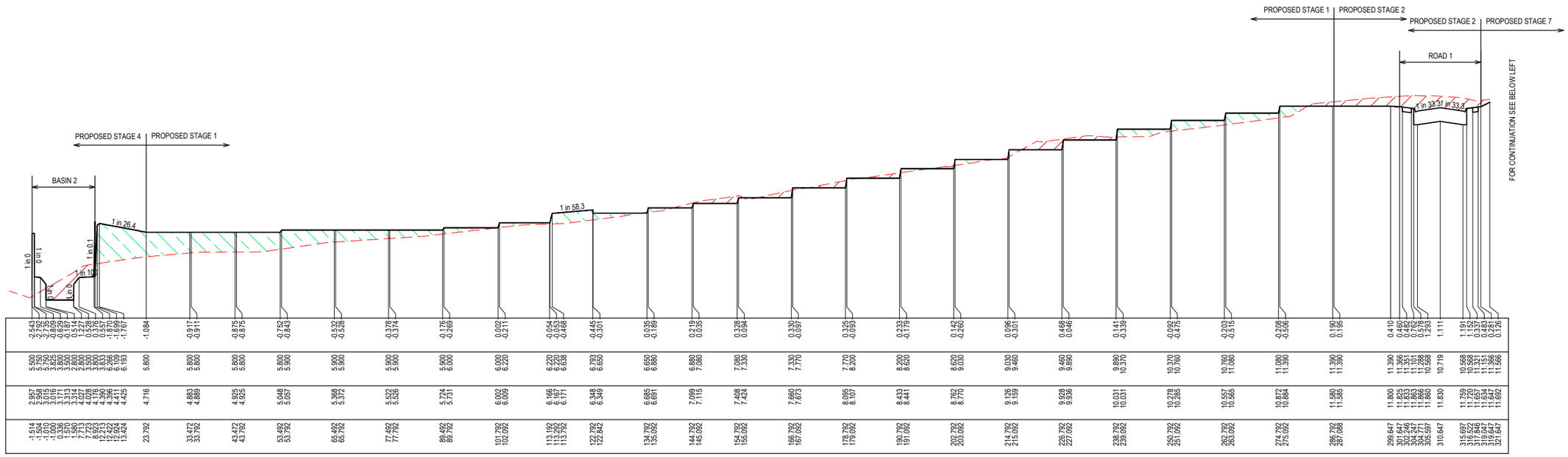
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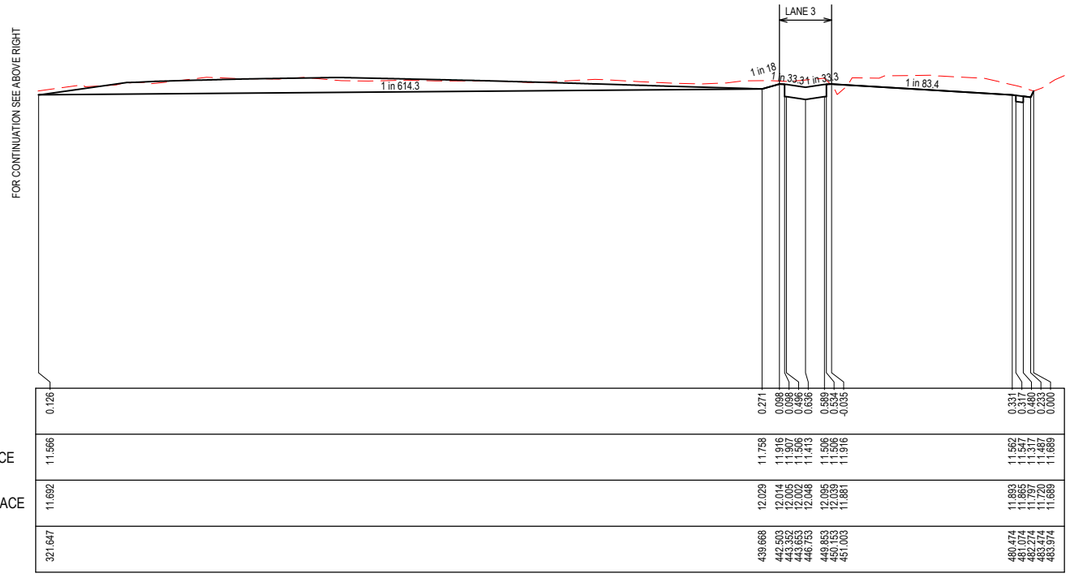
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PROPOSED STAGE 4
PROPOSED STAGE 2
PROPOSED STAGE 2
PROPOSED STAGE 6
STAGE 4 RESIDENTIAL LOTS
ROAD 3
CENTRAL PARK
ROAD 7
SOUTHERN PARK
BASIN No.1
ROAD 4
1 in 0
1 in 0.3
1 in 184
1 in 32
1 in 0.3
1 in 0.3
1 in 0.3
1 in 51.6
1 in 55
1 in 33.31 in 33.3
1 in 10
1 in 46.1
1 in 0.5
1 in 22.1
1 in 0.8
1 in 118.9
1 in 10
1 in 33.31 in 33.3
1 in 155.7
1 in 49.61 in 33.3
1 in 10
1 in 98.6
1 in 0.5

| | | |





LEGEND
- EXISTING SURFACE
- DESIGN LINE
- FILL HATCH
- CUT HATCH

SECTION B-B
CROSS SECTIONS

WARNING
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Approved	-
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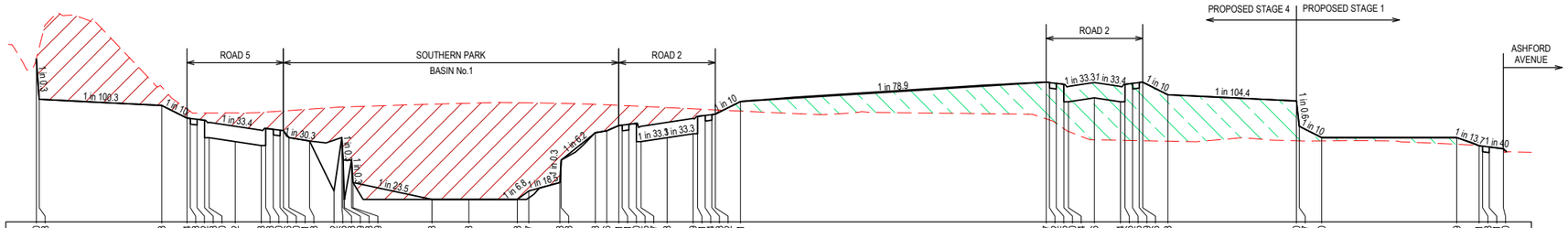
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SECTION B

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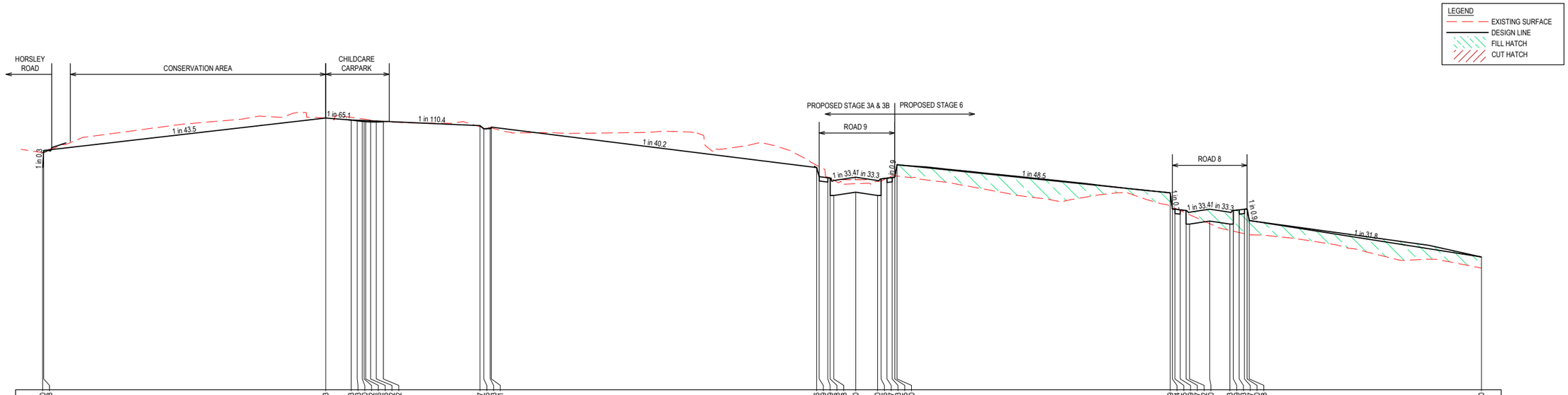
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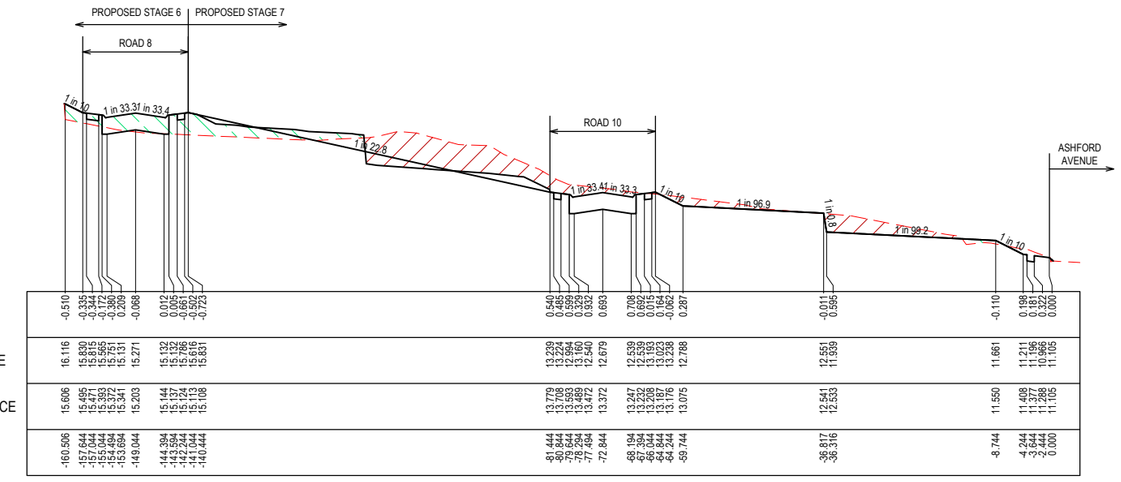
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LEGEND
- EXISTING SURFACE
- DESIGN LINE
- FILL HATCH
- CUT HATCH

| | | |





SECTION F-F
CROSS SECTIONS

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Drawn	G.N.
Checked	-
Date	-
Approved	-
Reg. No.	-
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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: BULK EARTHWORKS
SECTION F

Sheet 34 of 145
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