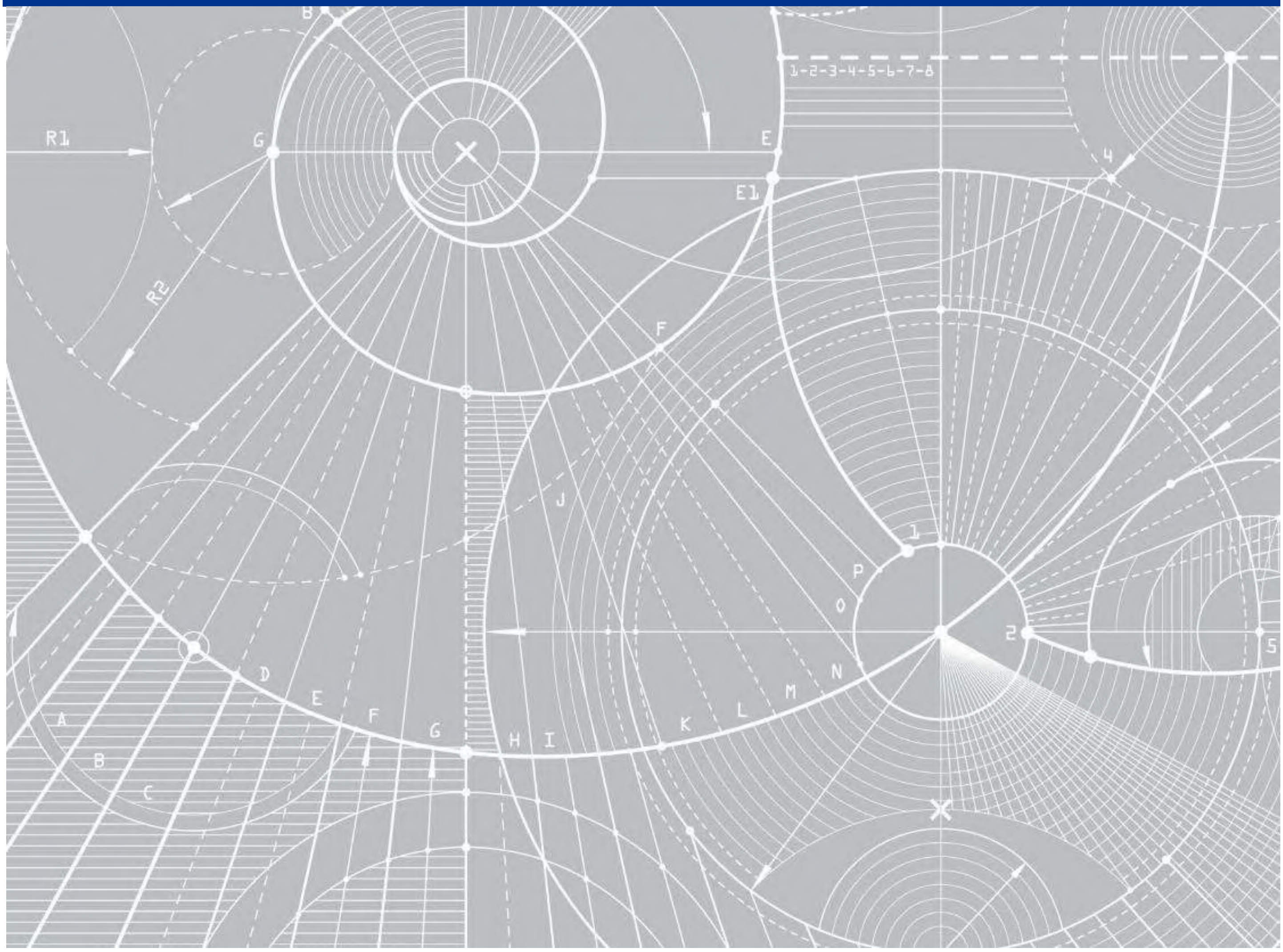
Site Audit Report 278_PBR by Dr Ian Swane

WESTCONNEX STAGE 3A PYRMONT BRIDGE ROAD WORKSITE (AREA C9)

ANNANDALE

Final | 25 NOVEMBER 2022



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1. Introduction

1.1 Background Information

WestConnex is a 33 km predominately underground motorway scheme that encompassed widening of the M4 Western Motorway, an eastern extension of the M4 (M4 East), a new section for the M5 Motorway (New M5), and a new inner western bypass of the Sydney CBD connecting the M4 and New M5 (M4-M5 link). The WestConnex Stage 3A project consisted of a group of underground tunnels connecting the M4-M5 Link with Victoria Road (just east of the Iron Cove Bridge) and The Crescent, the Anzac Bridge, and the City West Link **Figure 1-1**).

There were four worksites / compounds where construction work for the WestConnex Stage 3A project occurred at the ground surface, these being:

- The St Peters Interchange (**SPI**) interface worksite (Area C10) at St Peters;
- The Pyrmont Bridge Road (**PBR**) worksite (Area C9) at Annandale;
- The Parramatta Road East West (**PREW**) worksite (Areas C1b and C3b) at Ashfield; and
- The Northcote Compound (Area C3a) at Haberfield.

The locations of these areas are shown in **Figure 1-1**.

The land at each of these worksite compounds was the subject of a Statutory Site Audit, as defined by the NSW Contaminated Lands Management (**CLM**) Act 1997. The outcome of the site audit for each property was documented in its own site audit report (**SAR**). This SAR documents the outcome of the site audit for the PBR worksite (also referred to as the Site), which consisted of a single area located between Pyrmont Bridge Road and Parramatta Road (C9 area) located in the Inner West Council local government area (**LGA**). The total size of the PBR site compound was 14,300m^2 (1.43 ha) and consisted of three parts comprising 79 PBR, Stage 2 area and part of Bignell Lane. The location of the Site is shown in **Figure 1-2**. A Sixmaps subdivision plan for the PBR site is provided in **Figure 1-3**.

The three parts of the PBR site were located at:

- 79 PBR: On the northern side of Bignell Lane comprising one property at 79 Pyrmont Bridge Road, Annandale covering an area of 2,600m^2 (0.26ha);
- Stage 2 area: On the southern side of Bignell Lane comprising 8 properties at 95 PBR, 184-186, 182, 176, 174, 166-172, 164 and 160-162 Parramatta Rd covering an area of 8,300m^2 (0.83 ha); and
- Bignell Lane covering an area of 3,430m^2 (0.34 ha), with a plan showing the realignment of the lane provided in **Figure 1-4**.

The legal property descriptions of these two areas were:

- 79 PBR: Lots 1 & 2 in DP1108210 and Lot 250 in DP 701465;
- Stage 2 area: Lot 1 in DP 567291, Lot 101 in DP 701466, Lot 1 in DP 510297, Lot 1 in DP80066, Lot 1 in DP 175656, Lot 1 in DP 776389, Lot 1 in DP 82718, Lots A & B in DP 359751 and Lot 2 in DP 72951; and
- The road corridor that formed Bignell Lane.

The construction compound at the PBR site was used by the M4-M5 Link Contractor to facilitate the construction of the Stage 3 mainline tunnel, with a layout plan provided in **Figure 1-5** and an aerial view of the Site during construction provided in **Figure 1-6**. The Site was used as a tunnelling site and provided subsurface access via a temporary access to the mainline tunnels. Activities undertaken at the Site included:

- Utility works that included protection and/or adjustment of existing utilities, removal of redundant utilities and installation of new utilities;

Figure 1-1 Overview of WestConnex Stage 3A Project Footprint and Construction Ancillary Facilities

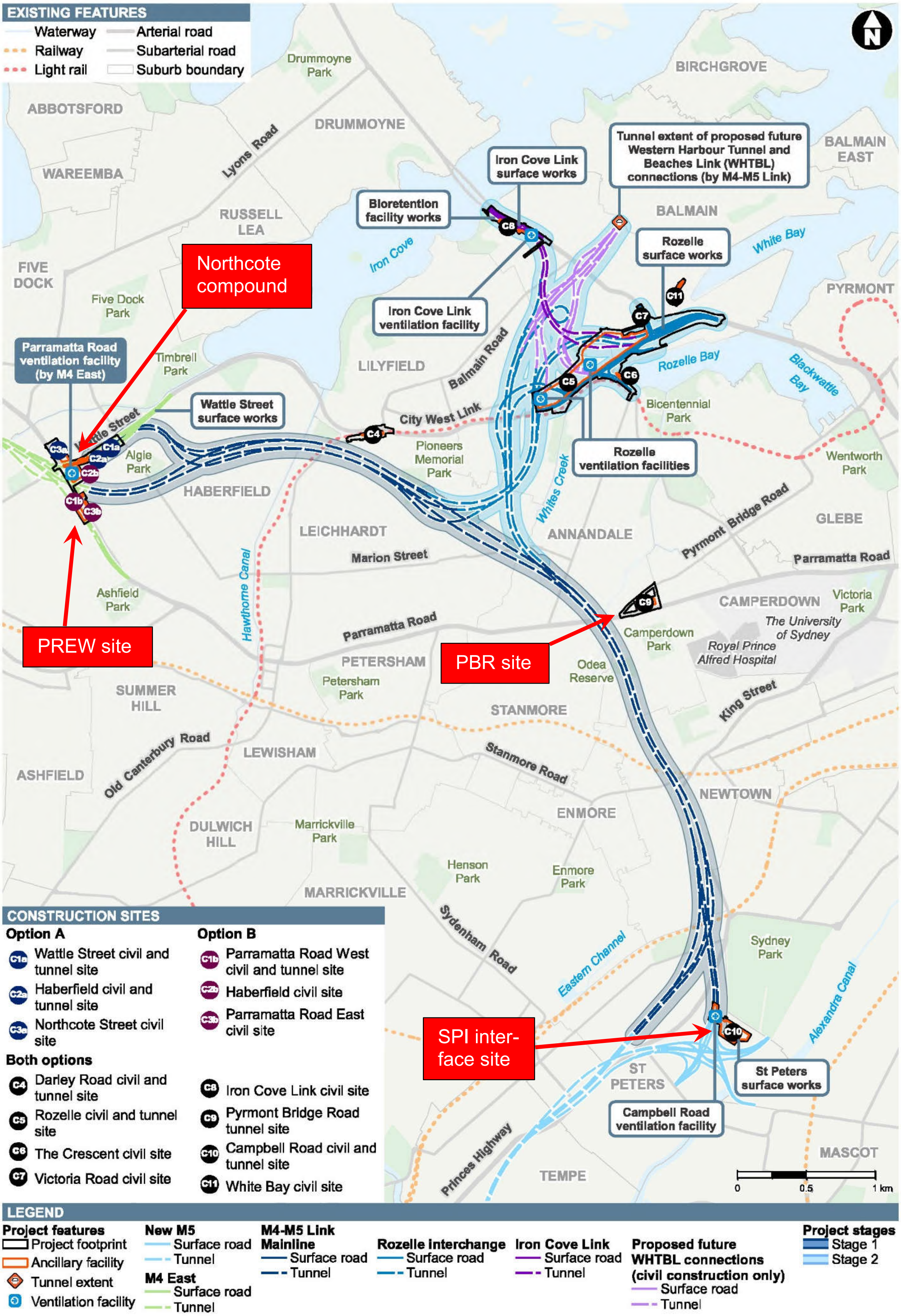

Figure 1-2 Location Plan for PBR site (Source: Map 3, Ref [52])

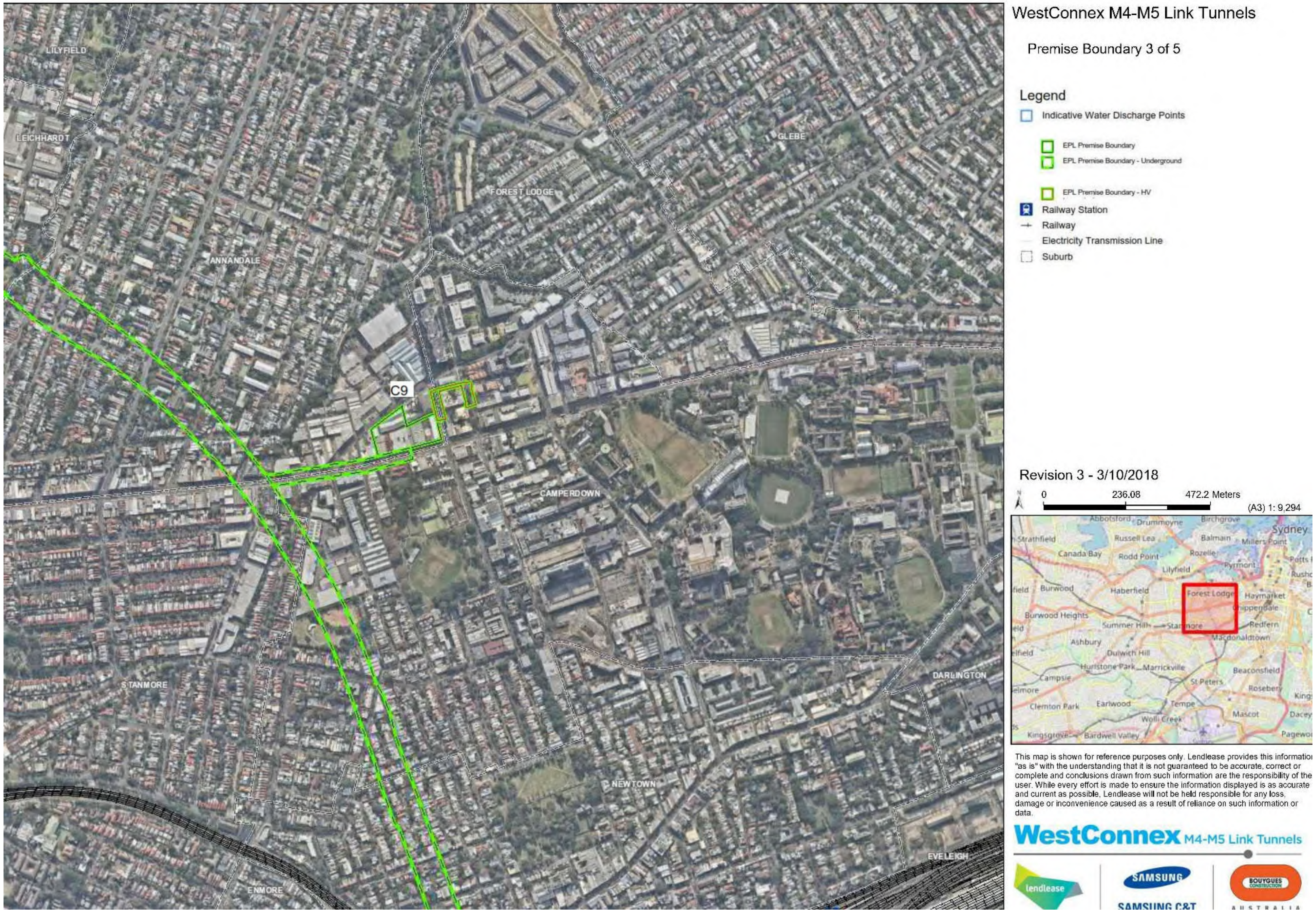

Figure 1-3 Six Maps 2019 Subdivision Plan for PBR site

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Figure 1-4 Plan Showing the Realignment of Bignell Lane (Source: ABSJV 3/08/21 email)

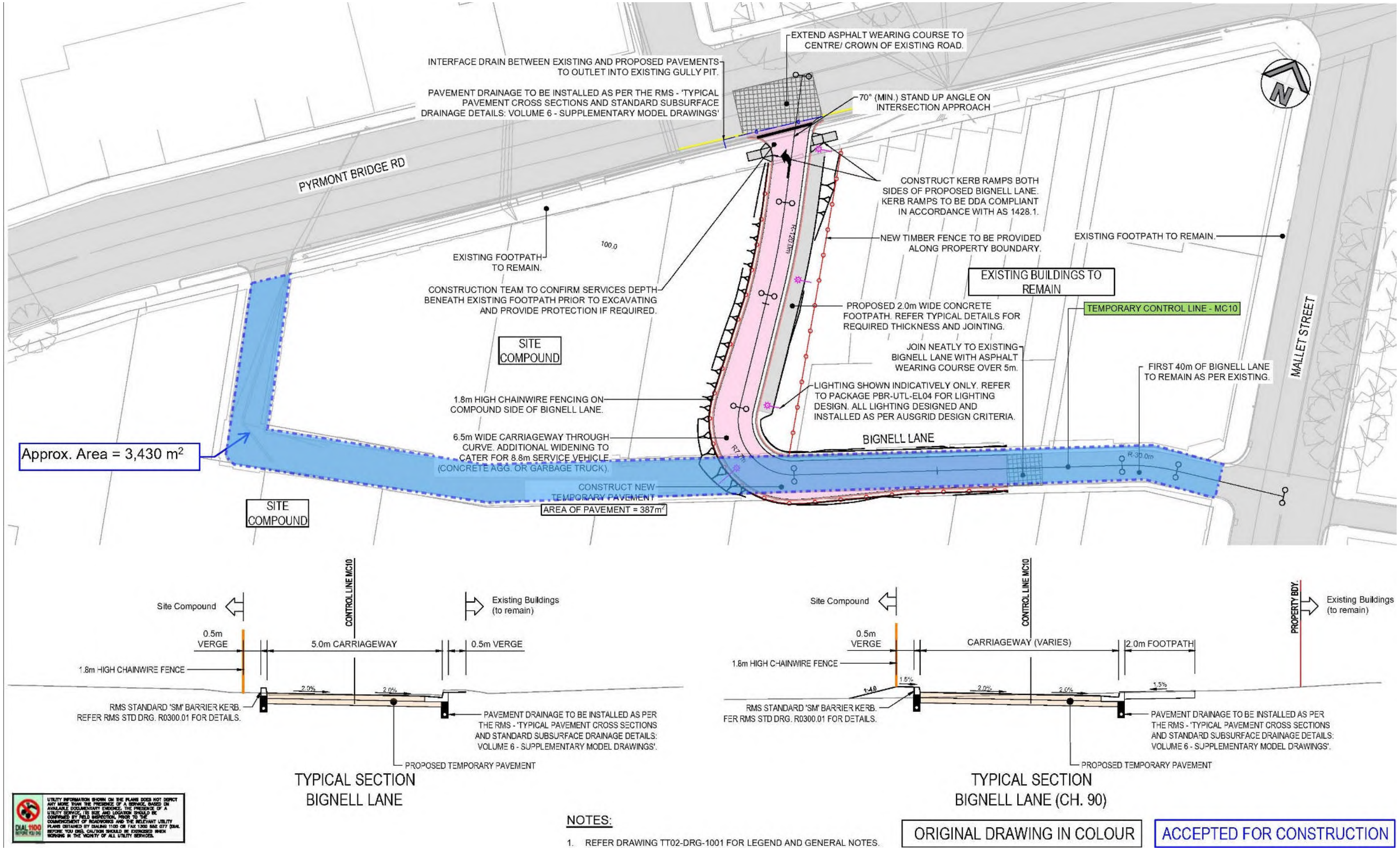
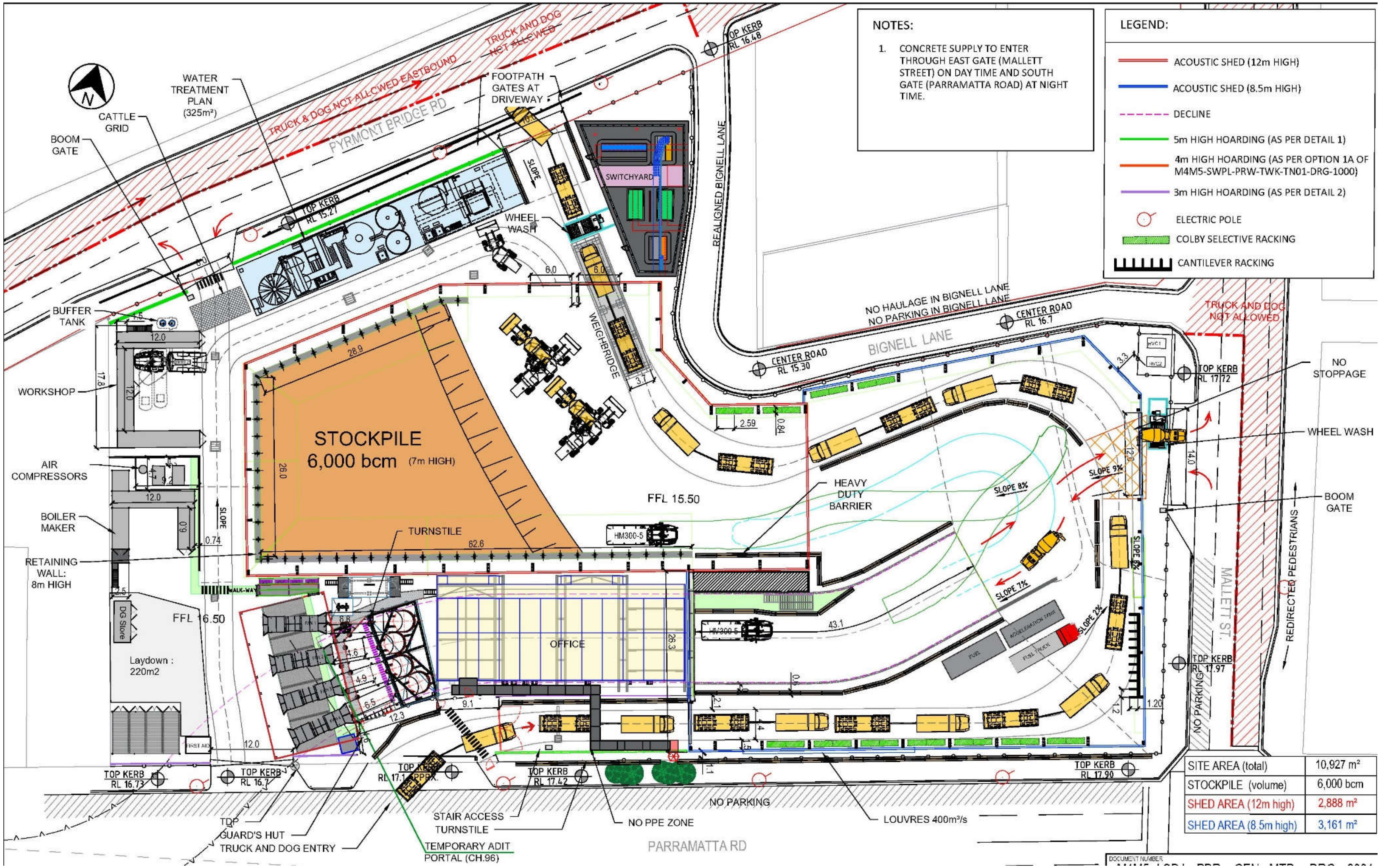


Figure 1-5 Proposed Layout for Works Compound at PBR site (Source: ABSJV 3/08/21 email)



SITE AREA (total)	10,927 m²
STOCKPILE (volume)	6,000 bcm
SHED AREA (12m high)	2,888 m²
SHED AREA (8.5m high)	3,161 m²

Figure 1-6 Aerial View of PBR site during Construction (Source: ABSJV 3/08/21 email)

8/3/2021, 2:35:31 PM

Ancilliary Facilities

1:1,128

0 0.01 0.02 0.04 mi

0 0.02 0.04 0.07 km

- Realignment of Bignell Lane;
- Removal of Underground Storage Tanks (**USTs**) encountered during site establishment works;
- Establishment of site offices, amenities and temporary infrastructure;
- Delivery of materials, plant and equipment;
- Laydown and storage of materials;
- Construction of an acoustic shed;
- Construction of a temporary access tunnel;
- Tunnel excavation of the mainline tunnels towards Haberfield and St Peters, stockpiling of excavated material and spoil haulage;
- Mechanical installation and fit out of the tunnels;
- Finishing works including pavement; and
- Demobilisation work that included among other things backfilling the temporary access tunnel, reinstatement of Bignell Lane to its original alignment and removal of all temporary services to prepare the Site for a permissible future use.

The final earthworks were required to ensure surface levels were suitable at the end of construction. The future use of the land was to be determined in accordance with the Residual Land Management Plan that was to be prepared for the project.

The audit was undertaken by Dr Ian Swane, a NSW Environment Protection Authority (**EPA**) Site Auditor Accreditation No. 9821. The audit was undertaken in accordance with the CLM Act. For annual return purposes to the EPA, the audit was numbered 278 in the records of the Site Auditor. The site audit was commissioned by [redacted] from Acciona Samsung Bouygues Joint Venture (**ASBJV**), formerly the Lendlease Samsung Bouygues Joint Venture (**LSBJV**), on 20/07/18. The audit was conducted in accordance with a proposal dated 15/07/18.

All site audit work reported in this SAR was undertaken by the Site Auditor, since all matters that needed to be audited and documented herein were within the expertise of the Site Auditor and no assistance was required from the Audit Support Team.

The Site Auditor checked the EPA website[1] at the beginning and during the audit and found that the Site was not recorded by the EPA as having been 'Declared' land or a notified site. All land within 200 m of the Site was also not recorded by the EPA as having been 'Declared' land, with practically all land not being a notified site. The two exceptions were

- A 7-Eleven petrol station at 198 PBR, Annandale that was assessed by the EPA as 'Regulation under CLM Act not required'. The 7-Eleven petrol station was located adjacent to but on the down-gradient side of the PBR site; and
- A former Gee Graphics operation at 27 Church Street, Camperdown that was assessed by the EPA as 'Regulation under CLM Act not required'. The 7-Eleven petrol station was located 181 m SE and possibly upgradient of the PBR site.

The potential contamination risks posed by this nearby land was considered in this SAR.

[1] www.epa.nsw.gov.au/clm

1.2 Purpose and Scope of the Audit

1.2.1 Purpose

The purpose and scope of the site audit was based on requirements specified in three documents:

- A contract made on or about June 2018 between the ASBJV and the NSW Government, which required ASBJV to deliver most of the work required by the WestConnex Stage 3A Project as described in the Planning Consent. Some work required by the Planning Consent may have been outside the scope of work to be undertaken by ASBJV;
- The Department of Planning Consent State Significant Infrastructure (**SSI**) 7485 ('**Planning Consent'**) issued for the WestConnex Stage 3A Project on 17/04/18 (Ref [50]). The proponent for the Project was Transport for NSW (**TfNSW**) formerly Roads and Maritime Services from the NSW Government; and
- An Environmental Protection Licence (**EPL**).

Contractual Requirements

With regards to site contamination, the Site Auditor understood that ASBJV was responsible for:

a) Complying with NSW Government environmental legislation regarding contaminated site and waste management;

b) Managing contamination that ASBJV interfered or disturbed during the course of carrying out its work;

c) Not generating contamination at the Project site or generating contamination that may cause an increase in contamination migrating from the Project site;

d) Returning the PBR site to a condition suitable for a road construction worksite; and

e) Complying with EPL 21149 (Ref [52]).

With regards to site contamination, the Site Auditor understood that ASBJV was not responsible for engaging the Site Auditor to determine whether:

f) Any part of the Project site had been remediated and made suitable for a specified use other than as a road construction worksite; and

g) Contamination that existed at the Project site prior to the commencement of the Project continued to migrate off-site.

The Site Auditor was understood to be responsible for:

h) Reviewing site environmental management plans that dealt with contamination at the Project site and to check whether these plans met Condition C22 of the Planning Consent as relevant to this site audit;

i) Reviewing contamination assessments for the Project site and whether they met Condition E181 of the Planning Consent;

j) Reviewing waste classifications and documentation on the management of waste removed from the Project site[2];

k) Reviewing reports on the management of contamination at the Project site throughout the period construction activities were undertaken by ASBJV and to determine whether:

   i. No additional contamination was generated by the construction work;

   ii. The land was maintained in a condition suitable for a road construction worksite and compliance was achieved with Conditions E182 to E185 of the Planning Consent;

   iii. Waste generated by construction activities at the Project site was managed in accordance with EPA guidance and Conditions E202 to E204 of the Planning Consent; and

[2] A requirement under Section 4.3.7, EPA (October 2017) Site Auditor Guidelines

iv. The requirements of Conditions O5.10 and O5.11 of EPL 21149 were met.

l) Notifying ASBJV, TfNSW and the EPA if the Site Auditor concluded that a part of the Project site should be notified to the EPA under the CLM Act[3];

m) Issuing a Section A site audit statement (**SAS**) for each part of the Project site where the ground surface was disturbed by construction work undertaken by ASBJV. Each SAS was to be issued at the completion of ASBJV sitework and needed to determine whether the land was suitable for a road construction worksite at the end of construction period and prior to landscaping by TfNSW.

With regards to site contamination, the Site Auditor understood that the NSW Government was responsible for separately engaging a Site Auditor to:

n) Determine whether land within the Project site was suitable for a specified use other than as a road construction worksite at the end of construction and prior to landscaping by TfNSW;

o) Review documentation prepared by environmental consultants that determined whether contamination migrating from the Project site not caused by ASBJV was posing an unacceptable risk to off-site receptors and needed to be remediated; and

p) Review work undertaken at the Project site in addition to that required by the EPA under Conditions O5.10 and O5.11 of EPL 21149.

Interim audit advice report #19 containing the Site Auditor's understanding of the purpose and scope of the site audit, as described above, was issued to ASBJV on 26/11/18 (**Appendix C**).

Planning Consent

The site audit was undertaken in accordance with the requirements of the Conditions of Approval for the WestConnex M4-M5 Link SSI 7485 Project issued by the Department of Planning and Environment dated 17/04/18 (Ref [50]). Relevant conditions of the Planning Consent for the purpose of this site audit were:

Contaminated Sites

E181 A Site Contamination Report, documenting the outcomes of Phase 1 and Phase 2 contamination assessments of land upon which the Critical State Significance Infrastructure (CSSI) is to be carried out, that is suspected, or known to be, contaminated must be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under the Contaminated Land Management Act 1997 (NSW).

E182 If a Site Contamination Report prepared under Condition E181 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with.

E183 A copy of the Site Audit Statement and Site Audit Report must be submitted to the Secretary and relevant council for information no later than one (1) month prior to the commencement of operation.

E184 An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared and must be followed should unexpected contaminated land or asbestos be excavated or otherwise discovered during construction.

E185 The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout construction.

[3] A requirement under Sections 3.8.2, 4.3.11 & 4.3.12, EPA (October 2017) Site Auditor Guidelines

Waste

E202 Waste generated during delivery of the CSSI is to be dealt with in accordance with the following priorities:

(a) waste generation is to be avoided and where avoidance is not reasonably practicable, waste generation is to be reduced;

(b) where avoiding or reducing waste is not possible, waste is to be re-used, recycled, or recovered; and

(c) where re-using, recycling or recovering waste is not possible, waste is to be treated or disposed of at a waste management facility or premise lawfully permitted to accept the materials or in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014, or to any other place that can lawfully accept such waste.

E203 Waste generated outside the site must not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.

E204 All waste generated during construction and operation must be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes.

Environmental Protection Licence 21149

The EPA issued EPL 21149 for the WestConnex Stage 3A Project dated 9/10/19 (Ref [52]). Relevant conditions of the EPL for the purpose of the PBR site audit were:

O5.11 Notwithstanding condition O5.10, construction activities may be undertaken following development of an Environmental Management Plan or similar, subject to written approval from a NSW EPA accredited site auditor.

1.2.2 Scope of Work

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

- Review a preliminary site investigation report (**PSI**) and a detailed site investigation (**DSI**) report prepared by environmental consultants engaged by ASBJV, provide interim audit advice, and obtain additional information from ASBJV environmental team as required;
- Review plans for the management of contamination during the period of construction work, provide interim audit advice and obtain additional information from the ASBJV environmental team as required;
- Inspect the PBR site prior to, during and at the end of construction work and provide interim audit advice;
- Review a close-out report prepared by ASBJV documenting the final site condition and how contamination was managed during the construction work; and
- Prepare a Section A SAS and SAR that determined whether the land disturbed by ASBJV was suitable for a road construction worksite at the end of the construction period and prior to landscaping by TfNSW.

1.3 Standards & Methodology

1.3.1 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 they existed at the time of this SAR, as listed on the EPA website[4].

1.3.2 Decision Process

The EPA[5] decision process for assessing the risks posed by ground contamination at an urban redevelopment site involved ten issues.

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 commonly adopted for environmental assessments conducted at an urban redevelopment site are summarised in **Table 1-1**. The Site Auditor used these DQI's and criteria to assess the reliability and adequacy of the data provided by Environmental Consultants and to identify documentation where the level of non-compliance was considered to be significant.

Table 1-1 Data Quality Indicators 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 site conditions 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 (1996) *'Sampling Design Guidelines'* for all potential contaminants of concern at all areas of environmental concern • 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 areas of environmental concern 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 < 30% for inorganic and 50% for organic analyses • Acceptable levels for equipment rinsate blanks • Achieve laboratory QC criteria

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

[5] Appendix A, EPA (October 2017) '*Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme (3rd edition)'*

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 contract made between ASBJV and the NSW Government described the PBR site as a road construction worksite. The Site Auditor considered this land use did not correspond to an urban redevelopment site as defined by the EPA (2017) Site Auditor Guidelines because:

- A road construction worksite did not correspond to one of the four land uses considered by the EPA 10-step decision process;
- A road construction worksite is covered by permanent concrete pavements and structures so there is no significant physical contact with underlying soils or groundwater;
- Future activities at a road construction worksite would be managed in accordance with a site-specific management plan;
- The Contract only required the site audit to consider contamination risks where the ground surface was disturbed by construction work undertaken by ASBJV;
- The Contract did not require ASBJV to remediate contamination but to undertake their work so that no additional contamination was generated by construction work;
- The migration of contamination from the PBR site was not an issue if pre-construction levels were not increased; and
- The PBR site was land owned by the NSW Government on which public infrastructure was to be constructed.

Given these circumstances, the Site Auditor applied the EPA decision process in a manner consistent with the ASBJB contractual requirements. This was done by adopting appropriate Data Quality Objectives (**DQOs**) described in the following section.

1.4 Data Quality Objectives

DQOs are performance and acceptance criteria developed during the planning of a site assessment. They are used to evaluate whether there is enough data of a high enough quality to support decision making[6].

The DQO process is a seven-step systematic planning approach used to prepare plans for environmental data collection activities. The DQO process was specified in the NEPM and provides a systematic approach for

[6] Section 1.2, EPA (April 2020 '*Consultants reporting on contaminated land, Contaminated land guidelines*'

defining the criteria that a data collection design should satisfy, including: when, where and how to collect samples or measurements; determination of tolerable decision error rates; and the number of samples or measurements that should be collected.

The Site Auditor assessed the appropriateness of the environmental site assessments (**ESAs**) using the following DQO process, which was considered to meet EPA requirements consistent with ASBJB contractual requirements:

- **Step 1: State the Problem** – Contamination at the PBR site needed to be managed consistent with its use as a road construction worksite in accordance with a contract between the ASBJV and the NSW Government.
- **Step 2: Identify the Decisions** – These decisions reflected the purpose and scope of the site audit described in **Section 1.2**. These decisions were:
  - Determine if the PBR site at the end of the construction period was suitable for a road construction worksite and compliance was achieved with Conditions E182 to E185 of the Planning Consent;
  - Determine whether ASBJV managed contamination it interfered or disturbed during the course of carrying out its work;
  - Determine whether operations at the PBR site may have generated contamination or caused an increase in contamination migrating from the site;
  - Recommend management strategies which may be required at the PBR site, including additional investigations and/or remediation works;
  - Determine whether there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the contamination management plan was feasible and would enable the specified use of the PBR site and prevent an increase in contamination migrating from the site;
  - Assess compliance with Condition E181 of the Planning Consent and Condition O5.11 of EPL 21149 (Ref [52]) and NSW Government environmental legislation regarding contaminated site and waste management; and
  - Waste generated by construction activities at the Project site was to be managed in accordance with EPA guidance and Conditions E202 to E204 of the Planning Consent.
- **Step 3: Identify Inputs to the Decisions** – These included:
  - Existing site information, site history, regional geology, topography, hydrogeology and background conditions;
  - The use of proper investigation techniques;
  - Data collected by investigations and monitoring programs implemented during the project;
  - Development of an appropriate conceptual site model (**CSM**) for assessing contamination risks;
  - The use of appropriate site assessment criteria and compare results as measured against these criteria; and
  - The use of EPA-approved risk assessment methodologies.
- **Step 4: Define the Study Boundaries** – As defined by the contract between ASBJV and the NSW Government comprising:
  - The boundaries of the PBR site; and
  - The condition of the PBR site at the end of construction works.
- **Step 5: Develop a Decision Rule** – The decision rules in characterising contamination at the PBR site were:
  - Data used in contamination assessments were to be of a sufficient quality that allowed decisions to be made regarding contamination risks at the site and compliance with regulatory requirements;

- Field and laboratory test results measured against EPA-approved criteria; and
- The site was suitable for ongoing use as a road construction worksite if soil, groundwater and soil vapour contamination did not pose an unacceptable risk to users of the motorway, workers stationed at the facilities and maintenance workers.

➢ **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; and
- The acceptable limits for laboratory quality assurance / quality control (**QA/QC**) parameters are 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 were 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 the field and laboratory testing programs are specified in **Table 1-1**.

1.5 Information Reviewed

The environmental reports reviewed for this audit (in approximate chronological order) comprised:

1. Transport for NSW (August 2017) "*M4-M5 Link Environmental Impact Statement, WestConnex*"
2. SESL (18 February 2019) "*Preliminary Site Investigation, WestConnex M4-M5 Link, 79 Pyrmont Bridge Road Site, Annandale NSW 2038*". Document No: J001247 PSI 79 Pyrmont Bridge Road Annandale 1.0.docx prepared for LSBJV
3. SESL (12 March 2019) "*Preliminary Site Investigation, WestConnex M4-M5 Link Stage 2 Pyrmont Bridge Road Site, Annandale NSW 2038*". Document No: J001309 PSI Stage 2 PBR Site 1.0.doc prepared for LSBJV
4. SESL (20 May 2019) "*Detailed Site Investigation, 79 Pyrmont Bridge Road, Annandale*". Document No: J001248 DSI 79 Pyrmont Bridge Road Annandale 1.0.doc prepared for LSBJV
5. Alliance Geotechnical (21 August 2019) "*Stage 2 Detailed Site Investigation, WestConnex M4-M5 Link Tunnels, Pyrmont Bridge Road (PBR) Site*". Document No: 8272-ER-1-3 Rev D prepared for LSBJV
6. ASBJV (18 November 2022) Email providing additional data on contamination management at PBR site during construction

Other information reviewed for this audit comprised:

50. Department of Planning and Environment (17 April 2018) "*Infrastructure Approval, Section 5.19 of the Environmental Planning & Assessment Act 1979, Application No: SSI 7485, Conditions of Approval for WestConnex M4-M5 Link SSI 7485". 76 pages*
51. Not used
52. NSW EPA (9 October 2018) '*Environmental Protection Licence Number 21149, WestConnex Stage 3A – M4-M5 Mainline Tunnels, WestConnex between M4 East at Haberfield and the New M5 at St Peters, Marrickville NSW 2204'. 30 pages*
53. LSBJV (10 October 2018) "*Site Establishment Management Plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0018-07
54. LSBJV (23 October 2018) "*Appendix B, Contaminated Land Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0021-01 Rev01
55. LSBJV (23 October 2018) "*Unexpected Contaminated Land and Asbestos Finds Procedure, M4-M5 Link Mainline Tunnels*". Appendix A of Ref [54]

56. LSBJV (31 October 2018) "*Pyrmont Bridge Road Tunnel Site, Demolition Waste Management Plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PBR-EN-MP01-PLN-0002-01 Rev02

57. LSBJV (17 April 2020) "*Appendix B5, Soil and Surface Water Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0005-09 Rev09

58. LSBJV (22 June 2020) "*Appendix B9, Waste Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0009-07 Rev08

59. JM Environments (19 September 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey*". Document No: JME18057-3-1 provided for LSBJV

60. JM Environments (9 November 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey - 2*". Document No: JME18057-11 provided for LSBJV

61. LSBJV (23 October 2018) "*Construction Work Method Statement, Demolition Works – Pyrmont Bridge Road*".

62. LSBJV (28 April 2021) "*Appendix B6 Groundwater Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0006-13 Rev13 (revision 1 dated 17 September 2018)

63. PSM (9 April 2020) Drawings "*M4-M5 Link Main Tunnel Works, Pyrmont Bridge Road, Construction Access Backfill and Stub Wall*". Document No: M4M5 PSML PBR STR IS21 DRG 1000 comprising 8 drawings prepared for Sydney Motorway Corporation WestConnex

64. ASBJV (27 June 2022) Drawings "*M4M5 Link Main Tunnel Works, Package: Project Wide M4M5-RBGP-PRW-CIV-CW02-DPK-0001, Construction Site Reinstatement*". 51 drawings prepared for Sydney Motorway Corporation WestConnex

65. ASBJV (14 September 2022) Drawings "*M4M5 Link Main Tunnel Works, Pyrmont Bridge Road Surface Demob CEMP Layouts*". Document No: M4M5-LSBJ-PBR-GEN-MTD-DRG-2207 comprising 4 drawings prepared for Sydney Motorway Corporation WestConnex

Additional information was obtained by the Site Auditor when site inspections were conducted at the PBR site on 2/06/21 and 4/11/22, with photographs taken by the Site Auditor provided in **Appendix D**.

1.6 Chronology of Site Audit Program

A chronology of the main activities relevant to the site audit work is provided below:

- 20 July 2018 – The Site Auditor was engaged and issued formal notification for the commencement of the site audit to the EPA;
- 15 October 2018 – The Site Auditor reviewed a draft PSI for 79 PBR prepared by SESL Australia ('**SESL**') and issued interim audit advice #10 (**Appendix C**);
- 16 October 2018 – The Site Auditor reviewed a draft sampling analysis and quality plan (**SAQP**) for 79 PBR prepared by SESL and issued interim audit advice #11 (**Appendix C**);
- 26 November 2018 - Interim audit advice #19 containing the Site Auditor's understanding of the purpose and scope of the site audit, as described above, was issued to ASBJV (**Appendix C**);
- 20 December 2018 – The Site Auditor reviewed and approved final versions of the SAQP and PSI report for 79 PBR in interim audit advices #20 and #21 (**Appendix C**);
- 29 January 2019 - The Site Auditor reviewed and approved a revised final version of the SAQP for 79 PBR in interim audit advice #22 (**Appendix C**);
- 12 March 2019 – SESL prepared a final version of the PSI report prepared for the Stage 2 area (Ref [2]);
- 14 March 2019 – The Site Auditor reviewed and approved a final version of the PSI report for the Stage 2 area in interim audit advice #29 (**Appendix C**);

- 4 April 2019 - The Site Auditor reviewed a draft DSI for 79 PBR and issued interim audit advice #30 (**Appendix C**);
- 11 June 2019 - The Site Auditor reviewed a draft DSI for the Stage 2 area prepared by Alliance Geotechnical ('**Alliance**') and issued interim audit advice #38 (**Appendix C**);
- 20 October 2019 - The Site Auditor reviewed a revised draft DSI for the Stage 2 area and issued interim audit advice #41 (**Appendix C**);
- 2 June 2021 - The Site Auditor inspected the PBR site during construction, with copies of photos provided in **Appendix D**;
- 26 July 2021 – The Site Auditor requested ASBJV provide additional information concerning the PBR site (**Appendix C**);
- 4 November 2022 – The Site Auditor conducted a final site inspection of the PBR site, with copies of photos provided in **Appendix D**;
- 25 November 2022 – ASBJV approved the draft SAS / SAR and provided an interim environmental management plan (**EMP**) for contamination assessment work that needed to be completed prior to a Section A2 SAS being issued for the PBR site. The Site Auditor then finalised the documents and issued the signed Section B SAS and this SAR to ASBJV, TfNSW, the EPA and Council. Copies of the Section B SAS and the interim plan are provided in **Appendix E**.

1.7 Abbreviations

ABC	Ambient background concentration
ACL	Added contaminant limit
ACM	Asbestos containing material
ADWG	Australian Drinking Water Guideline
AF	Asbestos fines
AHD	Australian Height Datum
ALF	Alexandria Landfill
AMP	Asbestos management plan
ANZECC	Australia and New Zealand Environment and Conservation Council
ANZG	Australian New Zealand 2018 water quality guidelines
APEC	Area of potential environmental concern
ARIS	Australian Soil Resource Information System
ASBJV	Acciona Samsung Bouygues Joint Venture
ASRIS	Australian Soil Resource Information System
ASS	Acid sulphate soil
AST	Above ground storage tank
B&D waste	Building and demolition waste
BaP TEQ	Benzo(a)pyrene toxicity equivalent
bgl	Below ground level
BOM	Bureau of Meteorology
BTEX	Benzene, toluene, ethyl benzene, xylenes
BTEXN	BTEX and naphthalene
C&D	Construction and demolition

CCA	Copper chrome arsenate
CEC	Cation exchange capacity
CEMP	Construction environmental management plan
CLM Act	Contaminated Land Management Act 1997 (NSW)
CLMP	Contaminated land management plan
COC	Chain of custody
COV	Coefficient of variation
CQA	Construction quality assurance
CQAR	Construction Quality Assurance Report
CS	Characteristic gas situation
CSI	Contaminated site investigation
CSSI	Critical State Significant Infrastructure
DBYD	Dial-before-you-dig
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
DOH	Department of Health (WA)
DPE	Department of Planning and Environment (NSW)
DQI	Data quality indicator
DQO	Data quality objective
DSI	Detailed site investigation
EFCP	Electrical friction cone penetrometer
EIL	Ecological investigation level
EIS	Environmental impact statement
EMP	Environmental management plan
EPA	Environment Protection Authority (NSW)
EPL	Environmental Protection License
ERP	Emergency response plan
ES	Environmental Strategies
ESA	Environmental site assessment
ESD	Ecologically sustainable development
FA	Fibrous asbestos
FSL	Finished surface level
GIL	Groundwater investigation level
GME	Groundwater monitoring event
GPS	Global positioning system
GSV	Gas screening value

GSW	General Solid Waste
GTA	Geotechnical Testing Authority
HAZMAT	Hazardous materials assessment
HC	Hydrocarbon
HDPE	High density polyethylene
HEIC	High energy impact compaction
HGG	Hazardous ground gas
HGGRA	Hazardous ground gas risk assessment
HHERA	Human health and ecological risk assessment
HIL	Health investigation level
ISEMP	Interim Site Environmental Management Plan
ITP	Inspection and Test Plan
Kg	Kilograms
L	Litres
LCMP	Landfill closure management plan
LCS	Laboratory control sample
LFG	Landfill gas
LFGMS	Landfill gas mitigation system
LGA	Local Government Area
LNAPL	Light non-aqueous phase liquid
LOP	Level of protection
LOR	Limit of reporting
LSBJV	Lendlease Samsung Bouygues Joint Venture
LTEMP	Long Term Environmental Management Plan
M	Metres
MAHs	Monocyclic aromatic hydrocarbons
Mg	Milligrams
MIP	Membrane interface probe
nd	Non-detectible
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NIOSH	National Institute for Occupational Safety and Health (USA)
NMOC	Non-methane organic compounds
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCP	Organochlorine pesticides
OHSP	Occupational health and safety plan
OSD	On-site detention basin

PAH	Polycyclic aromatic hydrocarbons
PASS	Potential acid sulphate soil
PBR	Pyrmont Bridge Road
PCBs	Polychlorinated Biphenyls
PCOC	Potential contaminant of concern
PFAS	Perfluoroalkyl and polyfluroalkyl substances
PID	Photoionisation detector
POEO	Protection of the Environment Operations (Act) 1997 (NSW)
PPE	Personal Protective Equipment
ppm	parts per million
PQL	Practical quantification limit
PREW	Parramatta Road East West worksite, Ashfield
PSI	Preliminary site investigation
QA	Quality assurance
QC	Quality control
QRA	Qualitative risk assessment
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RMS	Roads and Maritime Services
RPD	Relative percent difference
RL	Reduced level
RRE	Resource Recovery Exemption
RRO	Resource Recovery Order
RSL	US EPA Regional Soil Level
RSW	Restricted Solid Waste
SAC	Soil acceptance criteria
SAQP	Sampling and analysis quality plan
SAR	Site audit report
SAS	Site audit statement
SD	Standard deviation
SEARs	Secretary’s Environmental Assessment Requirements
SEMP	Site Establishment Management Plan
SEPP	State environment planning policy
SIL	Soil investigation level
SMDD	Standard maximum dry density
SOMC	Standard optimum moisture content
SMF	Synthetic mineral fibre
SMP	Site management plan

SOP	Standard operating procedure
SPI	St Peters Interchange
SPIR	Submissions and Preferred Infrastructure Report
SSI	State Significant Infrastructure
SVOCs	Semi volatile organic compounds
SWL	Standing water level
SWMP	Soil and water management plan
SWMS	Site work method statement
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total dissolved solids
TfNSW	Transport for NSW (formerly RMS)
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TSEMP	Task Specific Excavation Management Plan
TSS	Total suspended solids
UCL	Upper confidence limit
UFP	Unexpected Finds Protocol
USA	United States of America
US EPA	United States Environmental Protection Agency
UST	Underground storage tank
VB	Vertical barrier
VENM	Virgin excavated natural material
VHCs	Volatile halogenated compounds
VMP	Voluntary Management Proposal
VOCs	Volatile organic compounds
WCR	Waste classification report
WCX M5	WestConnex New M5
WHS	Worker health safety
WMP	Waste management plan
µg	micrograms

2. Review of Site Conditions in July 2018 Pre-ASBJV Work

This section of the SAR assesses the adequacy of data provided by ESAs on the condition of the PBR site and the contamination risks that existed in July 2018 at the time when ASBJV commenced sitework. The ESAs were:

- *A PSI for 79 PBR prepared by SESL dated 18/02/19 (Ref [2]);*
- *A PSI for Stage 2 area at PBR prepared by SESL dated 12/03/19 (Ref [3]);*
- *A DSI for 79 PBR prepared by SESL dated 20/05/19 (Ref [4]); and*
- *A DSI for Stage 2 area at PBR prepared by Alliance dated 21/08/19 (Ref [5]).*

2.1 Site Identification

A summary of the site location details provided by the ESAs, relevant to 2018 prior to the commencement of construction work at the PBR site, is presented in **Table 2-1**, with a subdivision plan showing the boundaries of the PBR site provided in **Figure 1-3**.

Table 2-1: Summary of Site Location Details

Site Location Detail	Detail	References
Site name	WestConnex Stage 3A area C9 comprising three parts: 79 PBR, the Stage 2 area, and Bignell Lane	Refs [2] – [5]; ASBJV 3/08/21 email
Address/location	79 PBR: On the northern side of Bignell Lane comprising one property at 79 Pyrmont Bridge Road, Annandale	Sectn 3.2, Ref [2]
	Stage 2 area: On the southern side of Bignell Lane comprising 8 properties at 95 PBR (Property 1), 184-186 (Property 2), 182 (Property 3), 176 (Property 4), 174 (Property 5), 166-172 (Property 6), 164 (Property 7) and 160-162 (Property 8) Parramatta Road	Sectns 2 & 3.2, Ref [3]
	Bignell Lane	Ref [5]; ASBJV 3/08/21 email
Legal property description	79 PBR: Lots 1 & 2 in DP1108210 and Lot 250 in DP 701465	Sectns 3.2, 5.2 & Appn C, Ref [2]
	Stage 2 area: Lot 1 in DP 567291 (Property 1), Lot 101 in DP 701466 (Property 2), Lot 1 in DP 510297 (Property 3), Lot 1 in DP80066 (Property 4), Lot 1 in DP 175656 (Property 5), Lot 1 in DP 776389 (Property 6), Lot 1 in DP 82718 and Lots A & B in DP 359751 (Property 7) and Lot 2 in DP 72951 (Property 8)	Sectns 2 & 3.2, Ref [3]
	Bignell Lane	Ref [5]; ASBJV 3/08/21 email
Local Government Area	Inner West Council	Sectn 3.2, Ref [2]; Sectn 3.2, Ref [3]
Site area	Whole site 14,300 m^2 (1.43 ha) comprising: • 79 PBR: 2,600 m^2 (0.26 ha); • Stage 2 area: 8,300 m^2 (0.830 ha); & • Bignell Lane: 3,430 m^2 (0.34 ha)	Sectn 3.2, Ref [2]; Sectn 3.2, Ref [3]; Sectn 2, Ref [5]; ASBJV 3/08/21 email
Owner	TfNSW (formerly RMS)	Sectn 3.2, Ref [2]; Sectn 3.2, Ref [3]

Site Location Detail	Detail	References
Contractor	ASBJV (formerly LSBJV)	Sectn 1, Ref [2]; Sectn 1, Ref [3]
Past Zoning	Commercial / industrial zoning that permitted operation of a car sales yard, car servicing & workshops, office space & general commercial activities	Sectn 3.2, Ref [2]; Sectn 3.2, Ref [3]
Current zoning	IN1 – General Industrial	
Future zoning	No known change	
Surrounding land use	The PBR site is surrounded by other light industry and commercial uses: East: residential terrace houses; North: PBR then commercial properties; West: Brewery then 7-Eleven petrol station; and South: Parramatta Road then other light industry and commercial uses	Sectn 3.4, Ref [2]; 3.4, Ref [3]

Legend:

Inadequate information provided in ESAs

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

- Comparing the multiple lines of evidence provided by the source data;
- Comparing the supplied data with other publicly available data obtained from NSW Government and other websites;
- Examining Google and SixMaps aerial photos on several occasions throughout the audit period**;** and
- Inspecting the PBR site throughout the audit period, with a photographic record provided in **Appendix D**.

The Site Auditor considered the information on site location details provided in the ESAs was close to meeting the documentation completeness DQO.

2.2 Site History

The historical data provided by the ESAs is summarised in **Table 2-2**, with a copy of the 1943 aerial photo provided in **Figure 2-1** and a 1956 plan of owners and land uses at the Site provided in **Figure 2-2**. The data covered the past 100 years over which time land uses at the PBR site appeared to have remained light industrial to commercial.

Table 2-2: Summary of Site History Details

Site History Detail	References
Property zoning and land use changes	Refs [2] to [4]
Property title search	Sectn 5.2 & Appn C, Ref [2]; Sectn 5.2 & Appn C, Ref [3]
Review of aerial photographs (1930, 1943, 1949, 1951, 1955, 1961, 1965, 1970, 1982, 1991, 2000, 2002, 2009, 2015, 2018)	Sectn 5.1 & Appn B, Ref [2]; Sectn 5.1 & Appn B, Ref [3]
Review of site photographs	Appn D, Ref [2]; Appn D, Ref [3]
Data provided by former owners/tenants/local Council	**Sectns 5.4, 5.5, 5.8 & Appn B, Ref [2]; Sectns 5.4, 5.5, 5.11 & Appn B, Ref [3]**
Inventory of chemicals and wastes associated with site use and their on-site storage location	**Not known**
Possible contaminant sources & potential off-site effects	Sectn 8, Ref [2]; Sectn 8, Ref [3]
Historic site layout plans	**Not provided**
Sewer and underground service plans	Sectn 3.3, Fig 4 & Appn A, Ref [2]; Sectn 3.3 & Appn A, Ref [3]
Extent of any filling or dumping at the site	Sectns 4.2 & 6.6, Ref [2]; Sectns 4.2 & 6.5, Ref [3]
Descriptions of manufacturing processes / operations	Sectn 5.2 & Appn C, Ref [2]; Sectn 5.2 & Appn C, Ref [3]
Details and locations of former underground storage tanks (USTs) and above ground storage tanks (ASTs)	**Sectn 3.3, 5.9, 6.3, Fig 4 & Appn D, Ref [2]; Sectn 3.3, 5.13 & 6.2, Ref [3]; Sectn 3.2 & Fig 5, Ref [5]**
Product spill and loss history	Not available
Discharges to land, water and air	Not available
Disposal locations	Not available
Relevant complaint history	Not available
Local site knowledge of residents and staff – both present and former	Not available
Summary of local literature about the site, including newspaper articles	Sectns 5.3, 5.6, 5.10 & Appn B, Ref [2]; Sectns 5.3, 5.6 & Appn B, Ref [3]
Details of building and related permits, licences, approval and trade waste agreements	**Sectns 5.4, 5.7 - 5.9 & Appn B, Ref [2]; Sectns 5.4, 5.7 – 5.13 & Appn B, Ref [3]**
Historical use of adjacent land	Sectns 5.3, 5.7, 5.11 & Appn B, Ref [2]; Sectns 5.3, 5.7, 5.8, 5.11 & Appn B, Ref [3]
Local usage of ground/surface waters, and locations of bores/pumps	Sectn 4.3 & Appn B, Ref [2]; Sectn 4.3 & Appn B, Ref [3]
Integrity assessment	Sectn 5.12, Ref [2]; Sectn 5.13, Ref [3]

Legend:

Data gaps in ESAs

Figure 2-1 1943 Historic Aerial Photo of PBR site (Source: Sixmaps NSW)

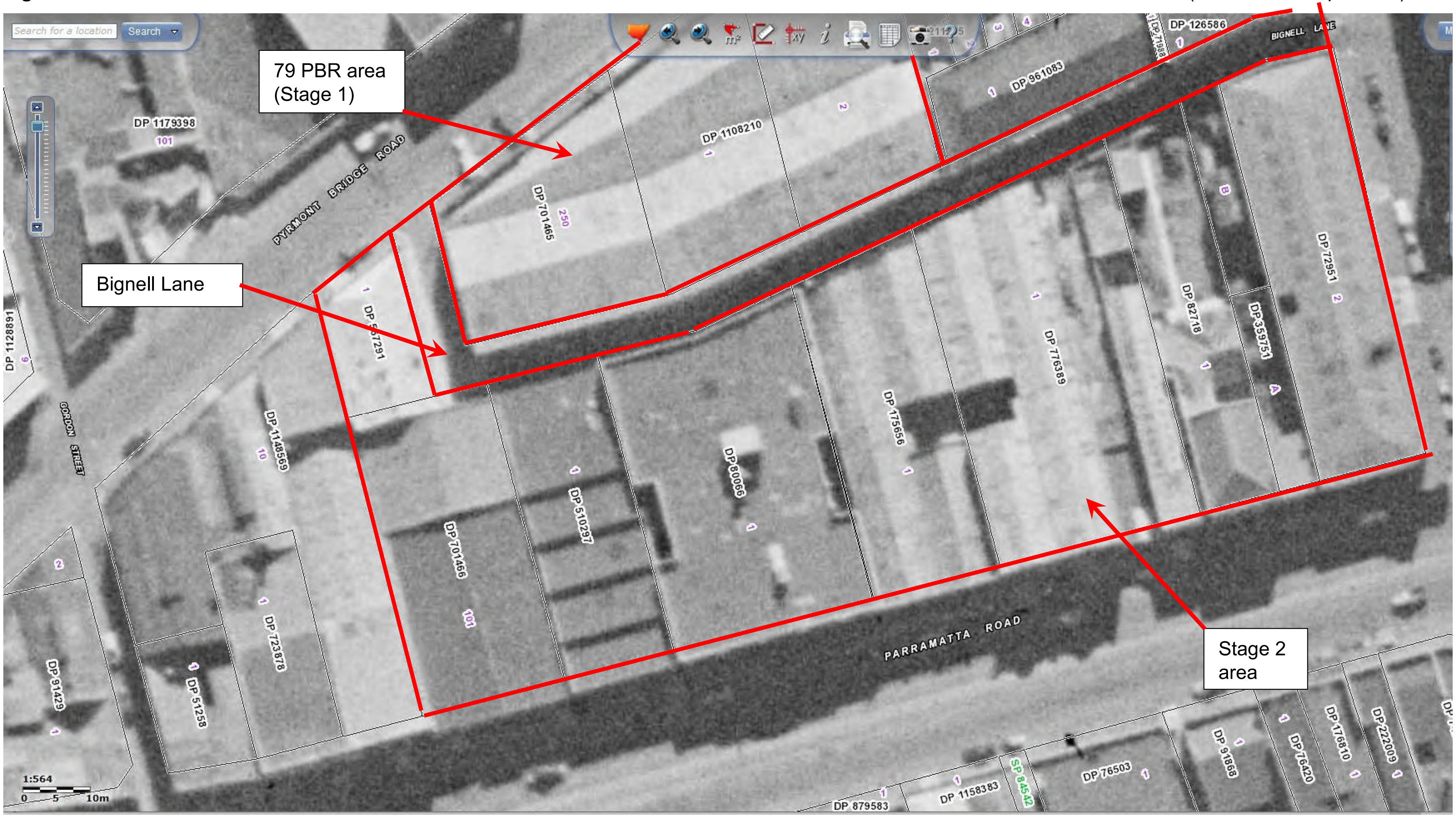
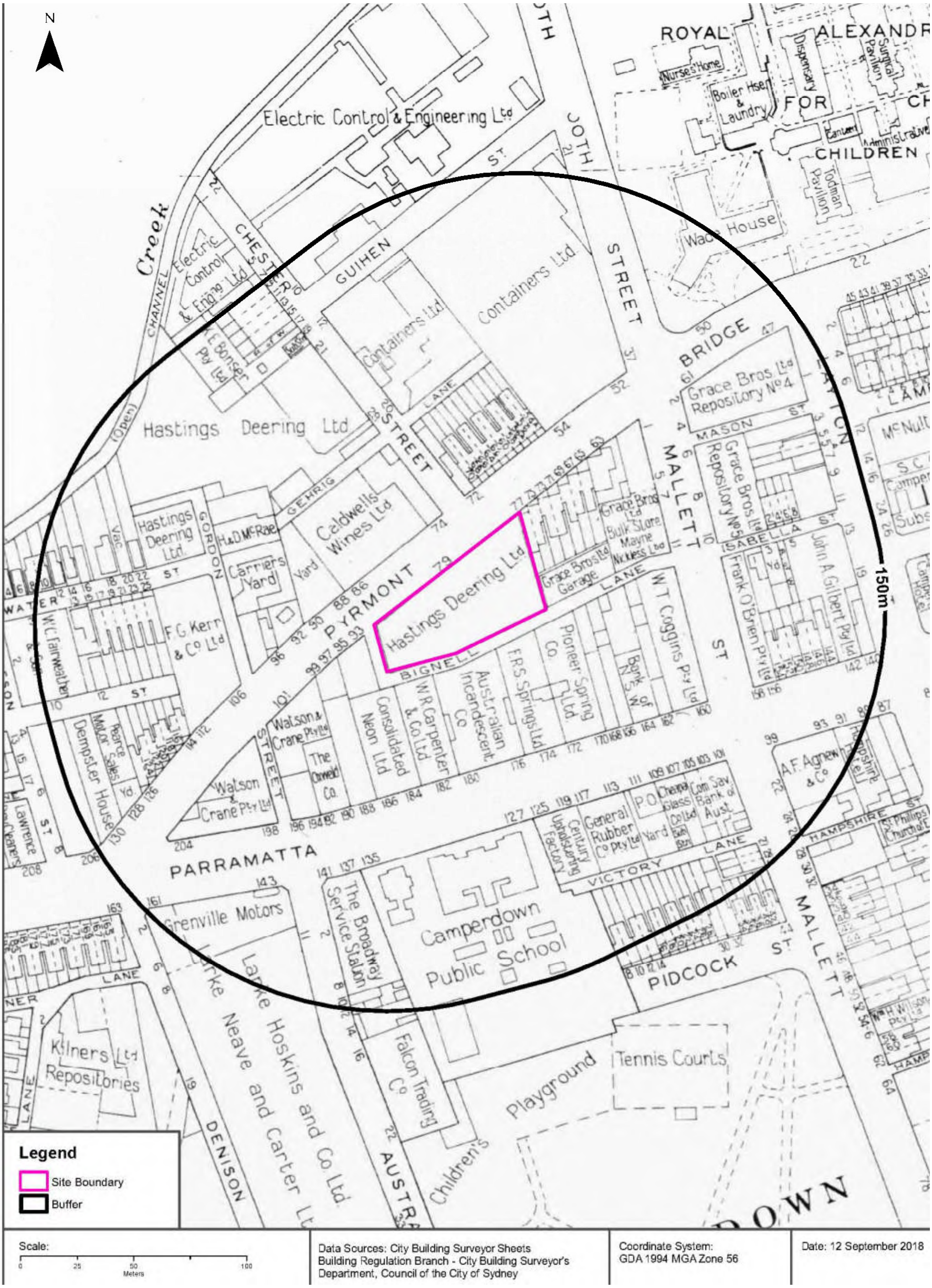


Figure 2-2 1956 Map of Property Owners Across Site & Surrounding Area (Appn B, Ref [2])



The historical data provided by the PSIs indicated that the PBR site had a long history of light industrial use that included coach building, vehicle workshop / servicing / panel beating, vehicle sales. Hastings Deering (a heavy vehicle manufacturer and distributor) owned the property at 79 PBR for over 30 years. Bignell Lane had been a road corridor since at least 1887[7].

The historical data provided by the PSIs indicated that the site layout had not changed since at least 1930 when the first aerial photo was taken. The historical data provided by the PSIs also indicated that surrounding land uses were a wide range of light industrial uses. The layouts of many of the surrounding properties had not significantly changed. The main change of relevance to this site audit was the triangular area of land to the west of the PBR site between Parramatta Road and PBR that changed from a Watson Crane operation to a 7-Eleven service station sometime between 1965 and 1970.

The Site Auditor assessed the accuracy of the historical assessments provided in the ESA reports by:

- Comparing the multiple lines of evidence provided by the source data;
- Comparing the supplied data with other publicly available data obtained from Council and EPA records;
- Checking that the conclusions were consistent with the site condition data (**Section 2.3**);
- Checking that the contaminants of concern agreed with recommendations given in the Contaminated Sites Monograph Series No. 3 (1994) *'Identification and Assessment of Contaminated Land, Improving Site History Appraisal'* and relevant EPA guidelines; and
- Inspecting the PBR site throughout the WestConnex Stage 3A project, with a photographic record provided in **Appendix D**.

Data gaps identified by the Site Auditor in the site history assessment provided by the ESAs comprised:

- A search of Inner West Council's records, which SESL proposed to undertake[8]
- Historic site layout plans showing the location and use of all manufacturing processes, chemical storage, waste disposal and how the layout of on-site developments changed over time
- A SafeWork NSW hazardous chemicals search was not undertaken and so historic details of UST or hazardous chemical storage were not obtained. SESL[9] advised that the WestConnex project needed to:
    - Expose every UST and identify hydrocarbon products and solvents contained in tanks;
    - Decommission and remove each UST;
    - Chase-out contamination; and
    - Validate the final excavation and remaining soils.
- The nature of chemical storage and location was not known
- An inventory of chemicals and wastes associated with site use and their on-site storage location.

Despite these data gaps, the Site Auditor considered the site history data provided by the ESAs was sufficient for developing a CSM for the PBR site appropriate for the management of contamination during construction work required by the Project. This is because:

- Data gaps in the historical assessment were unlikely to have a material effect on how contamination risks at the PBR site needed to be managed. This is because the intended use of the PBR site was as a road construction worksite, which was not a sensitive land use;

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7 Annandale 1887 map provided by the Dictionary of Sydney https://dictionaryofsydney.org/entry/atlas_of_the_suburbs_of_sydney#ref-uuid=fb29a8d4-4c02-0c76-5bbc-8e49335cb083
8 Sectn 5.4, Ref [2]; Sectn 5.4, Ref [3]
9 Sectn 5.9, Ref [2]; Sectn 5.13, Ref [3]

- Major excavations were to be undertaken at the PBR site that would be capable of uncovering unknown contamination; and
- There was potential to address the historical data gaps by making conservative assumptions in the CSM.

2.3 Site Condition and Surrounding Environment

The data provided by the ESAs on the condition of the PBR site in 2018 prior to the commencement of major construction work is summarised in **Table 2-3**.

Table 2-3: Summary of Site Condition Details

Site Condition Detail	References
Topography and Surface Conditions	
Regional and site topography	Sectns 3.2 & 4.1, Ref [2]; Sectns 3.2, 4.1 & Appn B, Ref [3]; Sectn 3.4, Ref [5]
Regional and site drainage patterns, flood potential	Sectns 4.1 & 6.2, Ref [2]; Sectns 4.1, 6.1, Ref [3]; Sectn 3.5, Ref [5]
Conditions at site boundary (e.g. type and condition of fencing, soil stability and erosion)	Sectn 6 & Appn D, Ref [2]; Sectn 6 & Appn D, Ref [3]
On-site developments, buildings and roads	Sectns 3.3, 6.1 & Appn D, Ref [2]; Sectn 3.3, 6.1 & Appn D, Ref [3]
Surface conditions (e.g. paving, vegetation)	Sectns 3.3, 6.1, 6.3 & Appn D, Ref [2]; Sectn 4.1, 6.1, 6.3 & Appn D, Ref [3]
Hazardous building materials	Sectn 6.5, Ref [2]; Sectn 6.4, Ref [3]
Sewer and service plans	Sectn 3.3, Fig 4 & Appn A, Ref [2]; Sectn 3.3 & Appn A, Ref [3]
Presence of USTs and ASTs	**Sectn 3.3, 5.9, 6.3, Fig 4 & Appn D, Ref [2]; Sectn 3.3, 5.13 & 6.2, Ref [3]; Sectn 3.2 & Fig 5, Ref [5]**
Presence of drums and wastes	Sectn 6.3, Ref [2]; Sectn 6.2, Ref [3]
Visible signs of contamination & odours at ground surface	Sectn 6.3 & Appn D, Ref [2]; Sectn 6.2 & Appn D, Ref [3]
Visible signs of plant stress	Sectn 6.4 & Appn D, Ref [2]; Sectn 6.3 & Appn D, Ref [3]
Geology and Hydrogeology	
Regional and structural geology	Sectn 4.2, Ref [2]; Sectn 4.2, Ref [3]; Sectn 3.1, Ref [5]
Borehole & test pit logs	Appn A, Ref [4]; Appn C, Ref [5]
Site stratigraphy and fill materials	Sectns 4.2 & 6.6, Ref [2]; Sectn 4.2 & 6.5, Ref [3]
Acid sulfate soils	Sectn 4.4 & Appn B, Ref [2]; Sectn 4.4 & Appn B, Ref [3]; Sectn 3.3, Ref [5]
On-site wells and springs	Sectn 4.3 & Appn B, Ref [2]; Sectn 4.3 & Appn B, Ref [3]
Nearby wells and springs	
Hydrogeological system operating at the site	Sectn 4.3 & Appn B, Ref [2]; Sectn 4.3 & Appn B, Ref [3]; Sectn 3.5, Ref [5]
Background water quality	**Not provided**
Local meteorology	Not relevant

Site Condition Detail	References
Surrounding Environment	
Location of nearest groundwater receptors	Sectn 4.3 & Appn B, Ref [2]; Sectn 4.3 & Appn B, Ref [3]; Sectn 3.5, Ref [5]
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 4.5 & Appn B, Ref [2]; Sectn 4.5 & Appn B, Ref [3]
Surrounding areas that may pose a pollution hazard to the site	Sectns 3.4, 5.3, 5.7 & 5.11, Ref [2]; Sectn 3.4, Ref [3]

Legend:

Data gaps in investigation reports

The various properties that mad up the PBR site are shown in **Figure 2-3**.

The main site features described by the ESAs relevant to the assessment of contamination risks at the PBR site are summarised below.

- **Topography**: The PBR site had an elevation of 18 – 20 mAHD, with the general slope towards the south, sloping down from PBR on the northern boundary and is built up above street level on the southern side on Bignell Lane and Parramatta Road (**Figure 2-4**). The slabs that covered the area were generally level with some raised concrete platforms and ramps, with filling used to meet street level. The properties along Parramatta Road were built up one storey higher than Bignell Lane.
- **Surface water drainage patterns**: Stormwater from the PBR site flowed into Johnsons Creek approximately 200 m to the NW.
  - 79 PBR: Any water or spills in the warehouse interior were expected to pool on the floor. Internal drains were observed. Stormwater drains in Bignell Lane were expected to manage any runoff from downpipes on the warehouse exterior; and
  - Stage 2 area: All properties were covered by slab or bitumen with no apparent infiltration areas. Stormwater was expected to be managed by infrastructure in Bignell Lane and Parramatta Road.
- **On-site developments:**
  - 79 PBR: In 2018 the area was occupied by a single two-storey warehouse building with multiple roller door accesses on the north and south sides.

    The exterior of the building was constructed of brick and concrete. Large concrete pillars held up a cinder block and concrete slab for the second storey. The interior was fitted with metal frames and sheeting to create storage units. The sheeting was coated with a white paint. Interior brick work was coated in white paint. Paint work was generally in good condition.

    The roof was constructed out of metal sheeting with plastic panel skylights. The paintwork on the slab was in very poor condition and the slab was cracked. A small courtyard (less than 10 m^2) was located on the eastern side of the site and contained a brick furnace and brick chimney. The courtyard was bound by four brick walls and accessible from a door within the warehouse.

    The exterior of the building was suspected to predate the 1930s (earliest aerial photograph) however the internal fittings (metal sheeting) were expected to have been installed around 1985 when the site was taken over for use as a storage facility.

    The ground floor was occupied by storage units, a large carparking area, a small area of office space, amenities and a petrol bowser. A second storey could be accessed by two sets of internal stairs and a ramp from the Site. The upper level contained storage units and amenities. All storage units were believed to have been emptied. A small basement area was accessible from a set of internal stairs in the SE corner and contained storage units.

Figure 2-3 Properties Forming PBR site

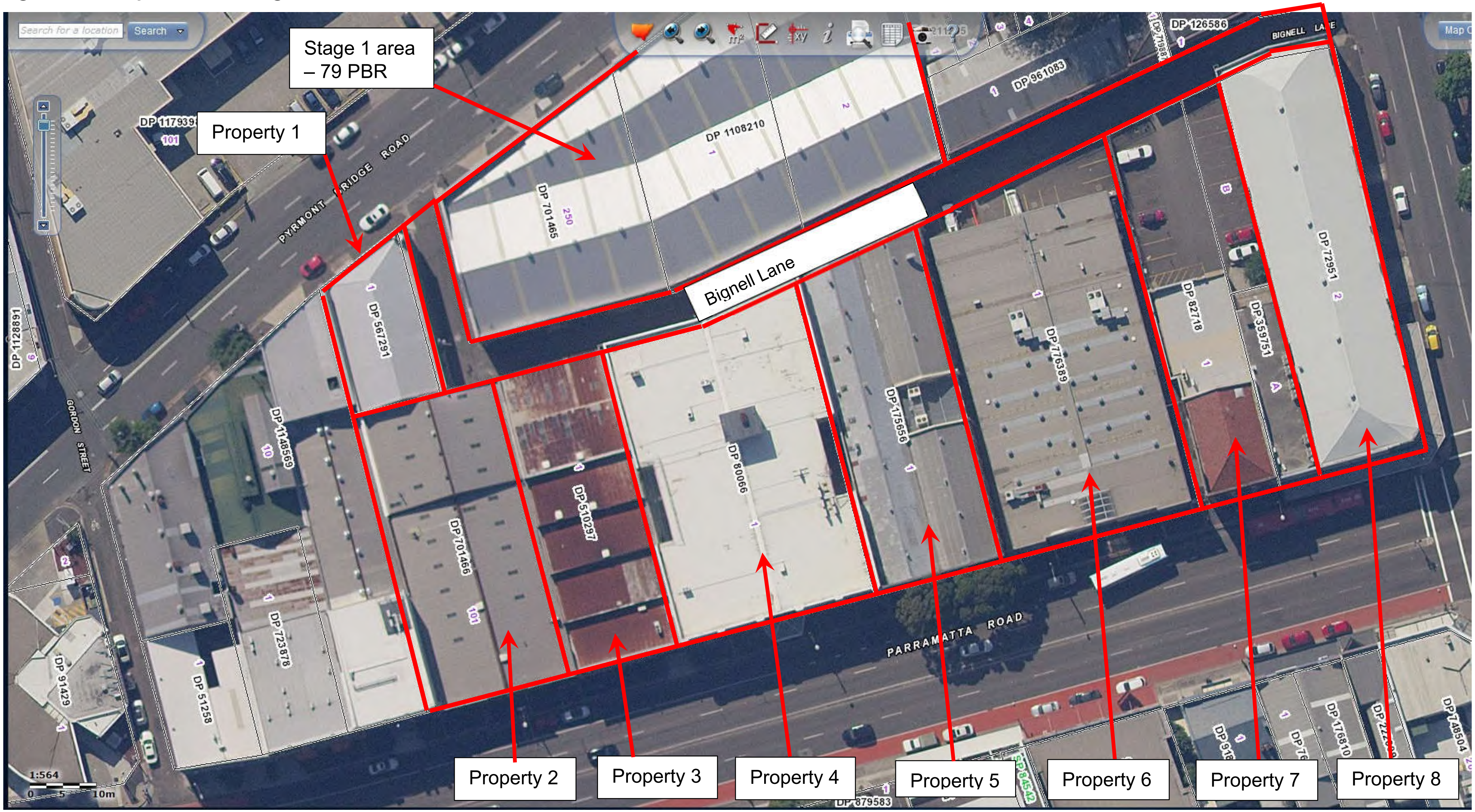
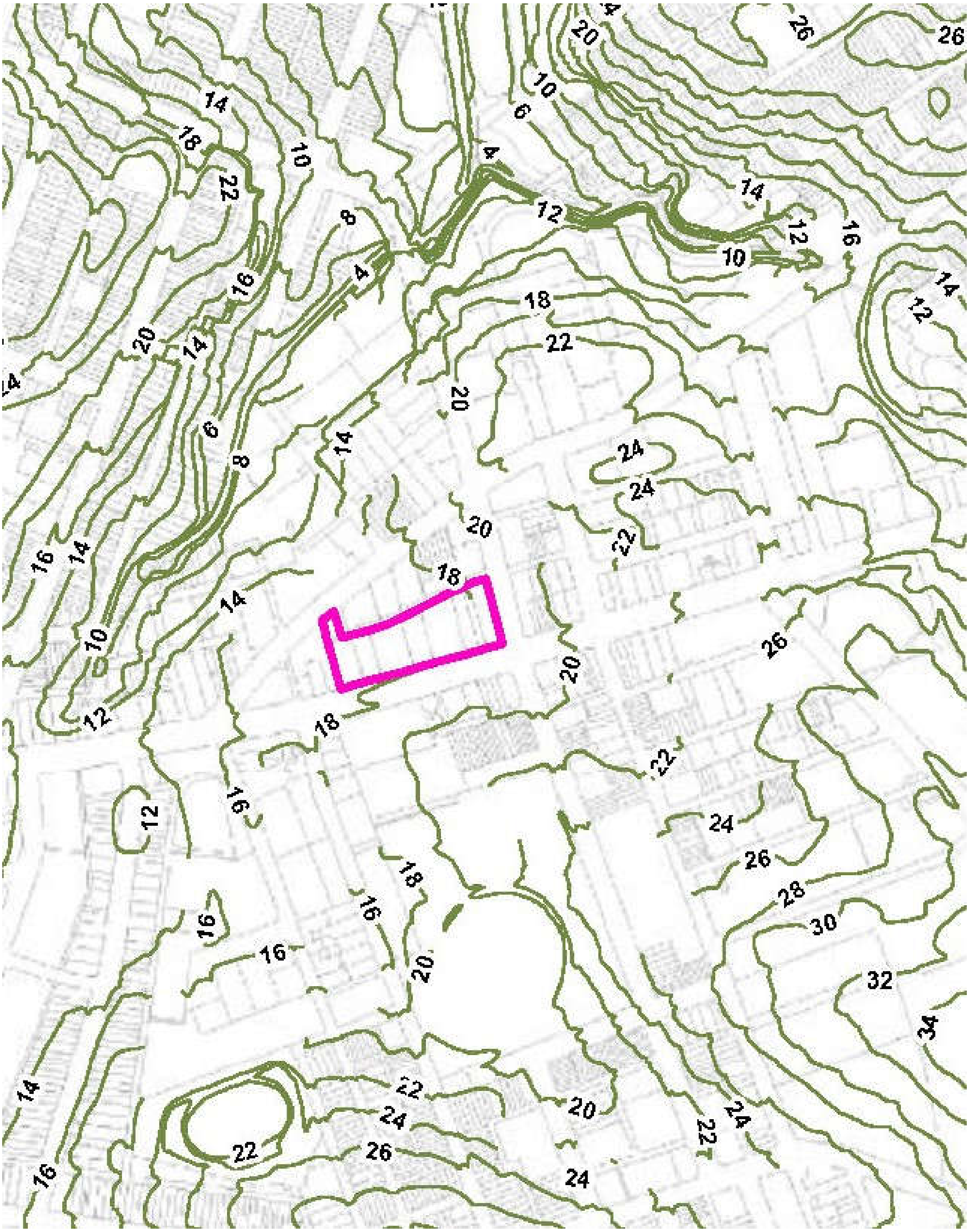


Figure 2-4 Topographic Plan of PBR site and Surrounding Area (Source: Appn B, Ref [3])



A brick furnace with chimney attachment was identified in a courtyard on the eastern boundary of the Site. The furnace interior contained charred material and ash. SESL suspected the furnace predated the 1930's, with the courtyard area where the furnace was located shown on a 1930 aerial photograph. It was not known what materials were burnt in the furnace, the integrity of the base or where ash from the furnace was disposed.

- Stage 2 area: In 2018 all 8 properties were being used for commercial purposes. Buildings were generally two-story brick structures with all areas sealed by ground floor slabs.

- **Surface conditions:**
  - 79 PBR: A concrete slab covered the entire area. Any spills or leaks inside the warehouse were expected to pool or be managed by internal floor drains. Some staining was observed on the floor of some units. Cracks were present in the slab. No direct evidence of spills over cracked surfaces were observed during a site inspection by SESL.
  - Stage 2 area: The area was sealed by building floor slabs and bitumen pavements. Cracks were present in the slab on most properties. No direct evidence of spills over cracked surfaces was observed during the site inspection but were considered likely to have occurred over the period of industrial occupation.
- **Hazardous building materials**: SESL advised that no asbestos containing material (**ACM**) or hazardous substances were observed during their PSI inspections conducted across the PBR site. It was unknown if the former storage facility had an asbestos register. SESL advised that a Hazardous Materials Assessment (**HAZMAT**) for the PBR site had been conducted.
- **Sewer & service plans**: Dial-before-you-dig (**DBYD**) searches found sewer, stormwater, Royal Price Alfred Hospital Trade Waste, National Broadband Network, and Telstra services were buried within the area footprint. Mains supply of water, sewer and electricity were connected to the Site. The location of buried services at 79 PBR are shown in **Figure 2-5**.
- **Presence of USTs**:
  - 79 PBR: Two underground storage tanks (USTs) were located on site by a service locator in the SW end below the carparking area (**Figure 2-5**). Two external vent pipes from the UST and two dip points on top of the USTs were visible. The USTs have been dipped, with the dipstick indicating one UST was partially filled with water and one partially filled with sand. The fuel bowser was located at the opposite end of the area, up to 50 m from the USTs. Connection between the UST and bowser was not confirmed; and
  - Stage 2 area: A UST was present in Property 5 in the groundfloor carparking area. The tank was dipped and filled with water, with a slight hydrocarbon odour detected on the dipstick.

  SESL concluded there was potential for other USTs to exist on-site. The SA considered the weight of evidence supported this conclusion. SESL advised that further investigation of USTs (including analysis to identify product, decommissioning, validation and contamination chasing if required) would be conducted during bulk earthworks.

  An additional UST was reported in the Alliance 2019 DSI at the eastern side of the Stage 2 area (**Figure 2-6**), but no further details were provided.
- **Presence of ASTs**: No ASTs were observed at the PBR site by the PSIs.
- **Presence of drums and waste**: No chemicals were observed during PSI inspections at the PBR site as all inspected properties had been emptied by the previous occupiers. SESL concluded that an extensive range of chemicals would have been stored across the various properties that formed the PBR site given its extensive industrial and manufacturing history. The nature of chemical storage and location was not known.
- **Visible signs of contamination at ground surface**: No significant odours or staining at the ground surface across the PBR site were observed by the PSIs.
- **Visible signs of plant distress**: The PBR site was entirely covered by buildings, ground slabs, and road pavements so there was no visible sign of plant distress.

Figure 2-5 2018 Layout of 79 PBR (Source: Figure 4, Ref [2])

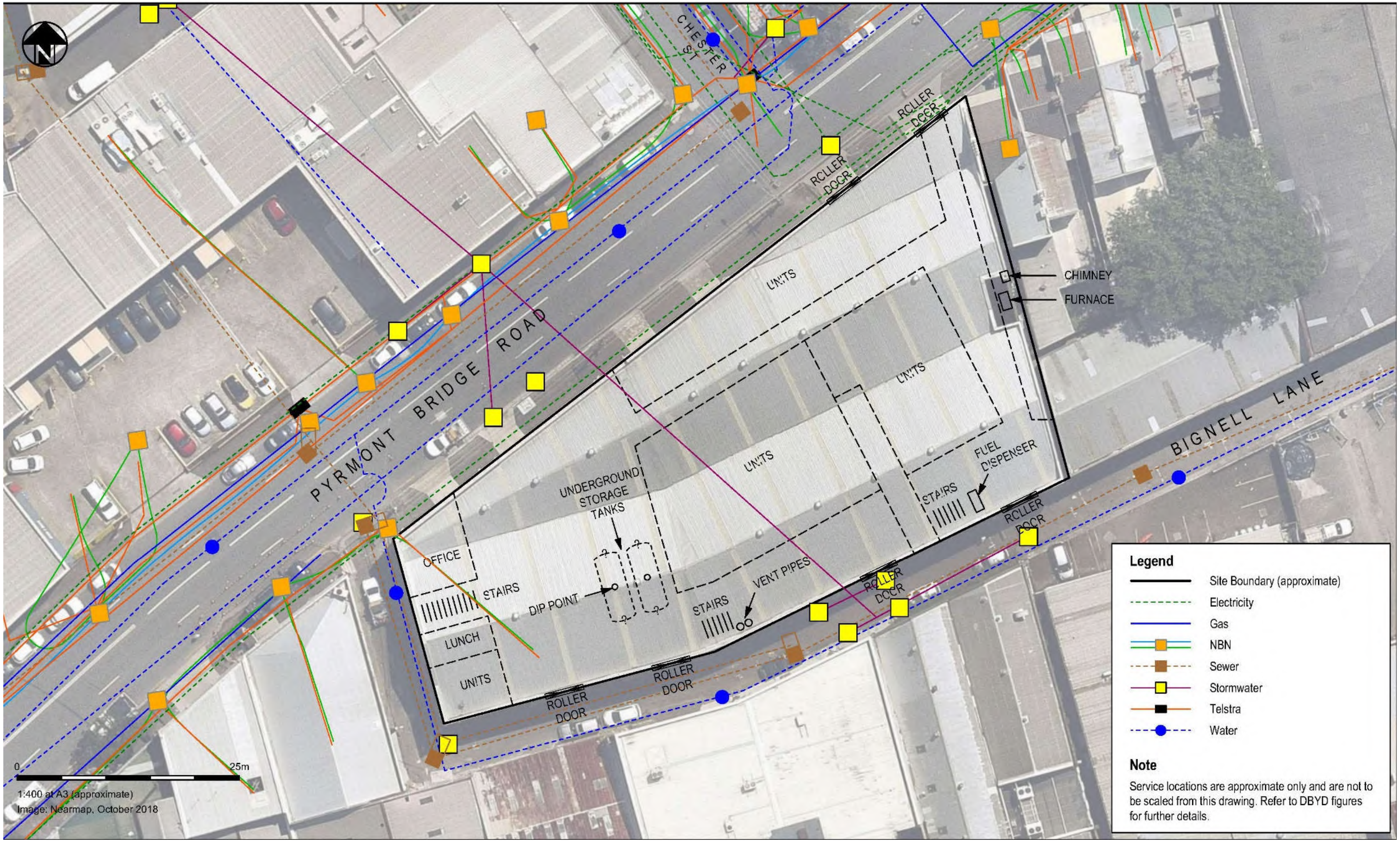
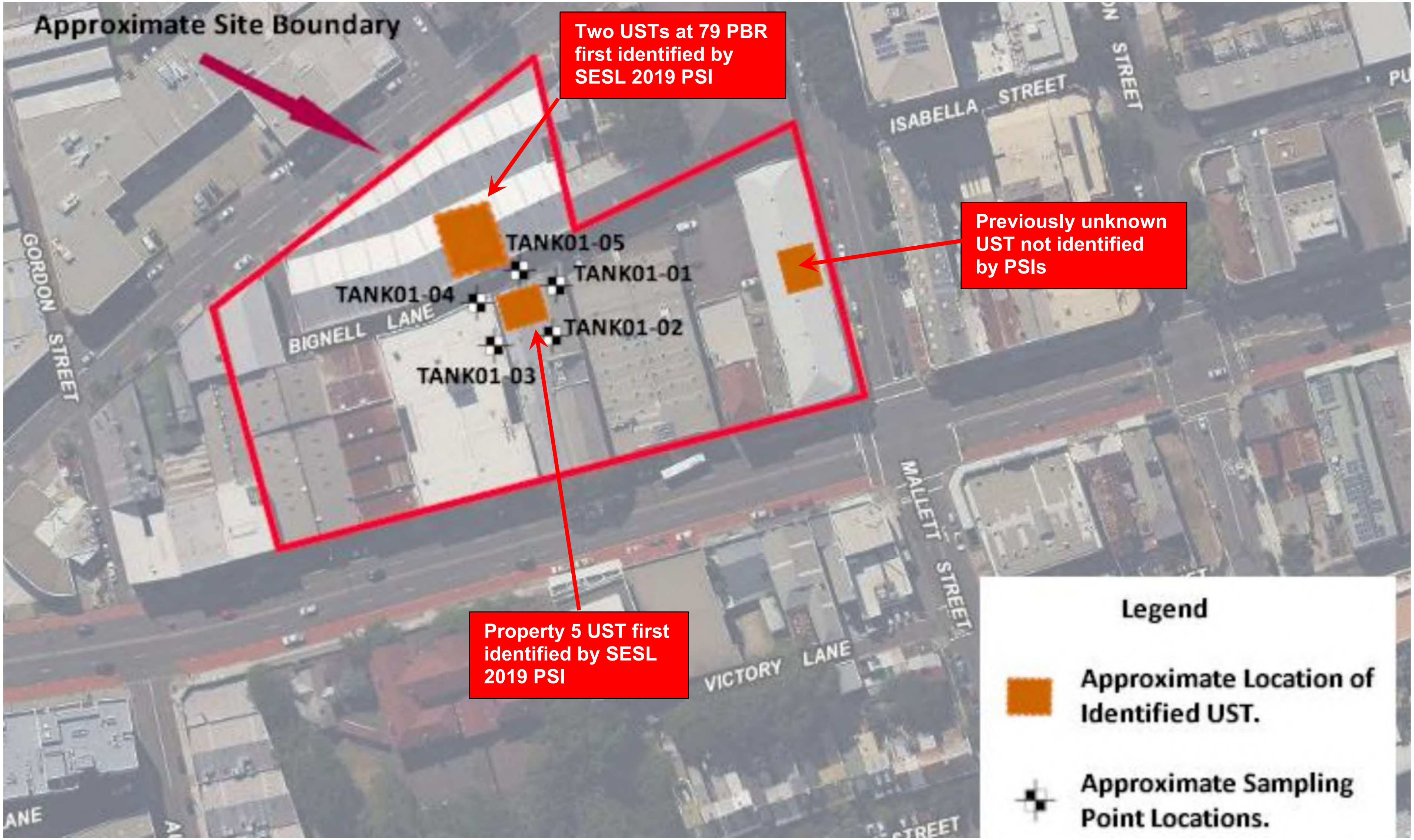


Figure 2-6 UST Locations Reported in Alliance 2019 DSI (Source: Figure 5, Ref [2])



- **Geology and site stratigraphy**: Surface geology at the PBR site consisted of Wianamatta Group shales underlain by Hawkesbury Sandstone.

  Historic cut and fill activities were suspected to have occurred to create the 2018 site levels. Significant cutting was likely to have occurred, since Bignell Lane was one storey lower than Parramatta Road, with lower levels (one storey below Parramatta Road) accessible from Bignell Lane observed at Properties 4, 5, 6 and 7 in the Stage 2 area. Fill was also expected to have been used to level the ground for slab construction. It was suspected that imported fill of unknown quality was placed above the natural soil and bedrock across the PBR site.

  Ground conditions at the Site comprised surface hardstands and a fill layer (0m – 2.5m thick), overlying residual sandy clay soils and weathered shale profiles of the Wianamatta group. Shales were underlain by Hawkesbury Sandstone. Properties 2 – 8 in the Stage 2 area had been cut for basement construction.

- **Acid sulfate soil (ASS) risk**: Low with no known ASS at or near the Site (Class 5).

- **Licensed groundwater bores**: A search of the NSW Natural Resource database identified 10 bores within a 1,000 m radius of the Site, with all being monitoring bores. The standing water level (**SWL**) that was recorded in three of the wells ranged from 5.5 to 7.2 mbgl. A WaterNSW plan showing the locations of these bores is provided in **Figure 2-7**.

- **Hydrogeological system and background water quality**: The PSI advised that, based on information from surrounding water bores, perched water may be present in fill material. Based on surrounding bores being installed into bedrock and Geoscience Australia identifying an aquifer on-site, it was likely that a relatively shallow aquifer existed in the bedrock. The topography of the surface and location of Johnsons Creek 200 m NW of the Site suggested that the groundwater flow direction was likely towards the NW. Geoscience Australia described the on-site aquifer as porous and extensive with high productivity.

- **Location of nearest surface water and groundwater receptors**: The closest receiving water body for stormwater discharges from the Site and groundwater underlying the Site was Johnson Creek 200 m to the NW, which discharged into Rozelle Bay that formed part of the Parramatta River (**Figure 2-8**).

- **Local sensitive environments**: Council records indicated there were no sensitive environments located near the PBR site. Johnson Creek was located 200m to the NW, which drained into Rozelle Bay that was part of the lower Parramatta River (**Figure 2-8**).

- **EPA PFAS investigation program**: The PSIs advised that a search of the EPA perfluoroalkyl and polyfluroalkyl substances (PFAS) investigation program list on 20/09/2018 did not identify any PFAS investigation sites within 1 km radius of the PBR site. Activities that had been undertaken historically on site posed a low PFAS risk to the PBR site.

- **Surrounding areas that may pose a pollution hazard to the site**: Surrounding land uses had a long history of light industrial use. The PSIs advised that historically, one dry cleaner and 26 service stations or motor garages were listed over the years to have been located within 150 m of the PBR site. In 2018 there were four service stations and four dry cleaners within 1 km of the Site (**Figure 2-8**).

  All land within 200 m of the PBR site was also not recorded by the EPA as having been 'Declared' land, with practically all land not being a notified site. The two exceptions were (**Figure 2-8**):

  - A 7-Eleven petrol station at 198 PBR, Annandale that was assessed by the EPA as '*Regulation under CLM Act not required*'. The 7-Eleven petrol station was located 50 m to the west and down-gradient of the PBR site; and

  - A former Gee Graphics operation at 27 Church Street, Camperdown that was assessed by the EPA as '*Regulation under CLM Act not required'*. The 7-Eleven petrol station was located 181 m SE and possibly upgradient of the PBR site.

Figure 2-7 Licensed groundwater bore locations (Source: Appn B, Ref [3])

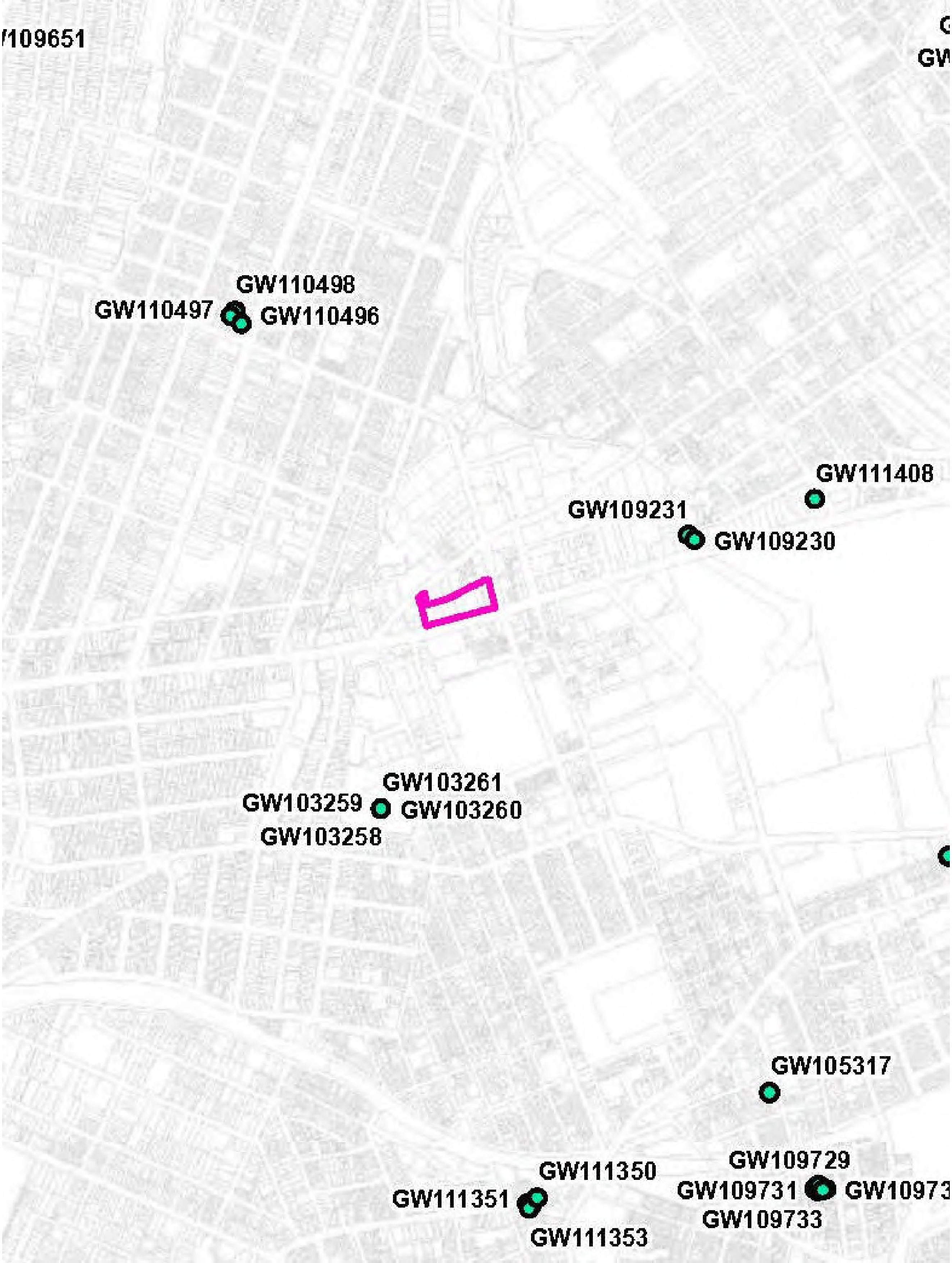


Figure 2-8 Features of Interest to PBR site (Figure 3, Ref [2])

The PSIs concluded that there was potential for pollution from these properties to migrate onto the PBR site and needed to be considered in the CSM. The Site Auditor considered the weight of evidence supported this conclusion.

The PSIs also considered a former landfill at O'Dea Reserve posed a contamination risk to the PBR site (**Figure 2-8**). The Site Auditor considered waste buried at O'Dea Reserve was likely to pose a low contamination risk to the PBR site because it was located 386 m south and cross-gradient from the Site and contamination at that location was no longer being regulated by the EPA.

The Site Auditor assessed the accuracy of the site condition assessment provided in the ESA reports by:

- Comparing the multiple lines of evidence provided by the source data;
- Comparing the supplied data with publicly available data provided by a topographical plan of the local area, the 1:100,000 geological map of Sydney[10], the Australian Soil Resource Information System (**ASRIS**), the WaterNSW website for groundwater bore information[11];
- Checking that the conclusions were consistent with the site history data (**Section 2.2**); and
- Inspecting the PBR site throughout the WestConnex Stage 3A project, with a photographic record provided in **Appendix D**.

The Site Auditor considered the site condition assessment was close to meeting the documentation completeness DQO. Data gaps identified were:

- The presence of hazardous building materials in structures at the PBR site that needed to be demolished by the WestConnex Stage 3A Project; and
- Data on USTs such as location, size, condition and stored chemicals.

The Site Auditor considered that data gaps in the site condition data provided by the PSIs could be addressed by making conservative assumptions in the CSM.

2.4 Preliminary Conceptual Site Model for Contamination

2.4.1 Potential Sources, Contaminants of Concern & APECs

The preliminary CSMs provided by the PSIs[12] considered the main contamination risks at the PBR site were posed by a range of potential sources, contaminants of concern and laydown mechanisms. The potential sources of contamination and their associated Areas of Potential Environmental Concern (**APECs**) are summarised in **Table 2-4**, with their associated contaminants of concern summarised in **Table 2-5**.

Table 2-4 Potential Contaminant Sources & APECs Identified by PSIs

Potential Contaminant Source	APEC ID
Potential soil contamination from imported fill materials of unknown origin	1
Potential soil, groundwater and/or soil vapour contamination from the former use of fuel bowser, USTs and associated pipework on site	2
Potential soil, groundwater and/or soil vapour contamination from chemical storage surface spills and leaks	3
Potential groundwater contamination underlying the site from former site activities	4

10 https://gmaps.geoscience.nsw.gov.au/100K/Sydney/
11 https://realtimedata.waternsw.com.au/water.stm
12 Section 8.1, Ref [2]

Potential Contaminant Source	APEC ID
Potential contaminated soil, groundwater or soil vapour from offsite manufacturing operations	5
Potential contaminated soil, groundwater or soil vapour from offsite service stations and vehicle workshops	6
Potential contaminated soil, groundwater or soil vapour from offsite dry cleaners	7
Potential contaminated soil, groundwater or soil vapour from offsite landfill	8
Potential soil contamination from furnace use and waste	9
Potential shallow soil contamination from the spraying of pesticides / herbicides	10
Buried services and hazardous building materials	11

Table 2-5 Contaminants of Concern for APECs (Source: Table 10, Ref [2])

PCoC	Potential Source/AEC
Heavy metals	• Fill of unknown quality • Former use of the site as a construction vehicle manufacturing & motor vehicle repair workshop • Surrounding historical industrial landuses • Materials incinerated in the furnace • Hazardous building materials
Total recoverable hydrocarbons (TRH)	• Fill of unknown quality
	• Former use of the site as a construction vehicle manufacturing & motor vehicle repair workshop • Surrounding historical industrial landuses
Benzene, toluene, ethylbenzene, xylenes (BTEX)	• Fill of unknown quality • Former use of the site as a construction vehicle manufacturing & motor vehicle repair workshop • Surrounding historical industrial landuses
Polycyclic aromatic hydrocarbons (PAH) and total phenolics	• Fill of unknown quality • Former use of the site as a construction vehicle & motor vehicle repair workshop • Surrounding historical industrial landuses
Polychlorinated biphenyls (PCB)	• Fill of unknown quality • Former use of the site as a construction vehicle & motor vehicle repair workshop • Surrounding historical industrial landuses • Hazardous building materials
Volatile organic compounds (VOC) including chlorinated solvents	• Fill of unknown quality • Former use of the site as a construction vehicle & motor vehicle repair workshop • Surrounding historical industrial landuses
Asbestos	• Fill of unknown quality • Hazardous building materials
Ammonia	• Surrounding historical industrial landuses
OCPs, OPPs and phenoxy acid herbicides	• Spraying of pesticides and herbicides (underneath buildings, around services)

The SA considered the available historical and site condition data reviewed in **Sections 2.2** and **2.3** supported these potential sources of contamination, APECs and contaminants of concern, with:

- APEC 3 also including pits / other types of underground structures associated with chemical/waste storage; and
- APEC 11 also including contamination caused by demolition work.

2.4.2 Potential Receptors & Exposure Pathways

The potential human / ecological receptors identified by the PSIs[13] were:

- Construction workers being exposed to contaminated soil, groundwater or vapour;
- Community members living within vicinity of the PBR site;
- Visitors to the PBR site; and
- Maintenance workers for future site use.

The Site Auditor considered the available data supported the potential receptors identified by the PSIs together with:

- Potential future workers at the road construction worksite (equivalent to industrial landuse);
- Potential terrestrial ecosystems at landscaped areas of the road construction worksite;
- Groundwater users of potentially contaminated groundwater for water supply (i.e. groundwater wells and spears); and
- Environmental receptors in Johnson Creek located 200m NW of the PBR site, which drained into Rozelle Bay that was part of the lower Parramatta River.

The potential exposure pathways identified by the PSIs[14] were:

- Incidental dermal contact, ingestion or inhalation of impacted soils;
- Generation of impacted dusts, aerosols or sediments from impacted soils;
- Inhalation of vapours from impacted groundwater;
- Direct dermal contact with contaminated groundwater during construction;
- Inadvertent use of contaminated groundwater;
- Inadvertent use of potentially contaminated water downstream of the site; and
- Surface runoff and stormwater drainage system.

The Site Auditor considered the available data supported the potential exposure pathways identified by the PSIs together with:

- Extraction of contaminated groundwater during tunnelling work; and
- Future extraction of contaminated groundwater for beneficial reuse (e.g. irrigation).

[13] Section 8.4, Ref [2]; Section 8.3.3, Ref [3]
[14] Section 8.3.2, Ref [2]; Section 8.3.2, Ref [3]

2.5 Investigation Criteria

2.5.1 Aesthetic

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

NEPM 2013 further clarified that "*Care should be taken to ensure adequate site characterisation, particularly when there is a diverse range of foreign material and associated fill and an appreciable risk inferred from site history (or lack thereof) for the presence of hazardous contaminants. For example, some ash fill may contain PAHs and metals, while other ash deposits may contain no contaminants of concern."*

Aesthetic criteria were specified for the PBR site by the Alliance 2019 DSI[15]. The criteria comprised:

- 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 abattoir sites).

The Site Auditor considered these aesthetic criteria were appropriate for the future land use of the PBR site as a road construction worksite.

2.5.2 Soil

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

The Site Auditor reviewed contamination risks at the PBR 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 potential contaminants of concern, reference was made to the CRC-CARE guidelines, the latest US EPA Regional Soil Levels (**RSLs**) or Canadian guidelines.

SILs were 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

[15] Section 6.3, Ref [5]

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 land use considered most appropriate for a road construction worksite was Category D commercial / industrial.

The Alliance 2019 DSI adopted NEPM (2013) Category D commercial / industrial HILs for all soil types and soil depths. However, no assessment was provided concerning the soil characteristics used to derive the soil criteria, with HIL D criteria only provided in the laboratory summary tables for heavy metals and benzo(a)pyrene toxicity equivalent (BaP TEQ).

The Site Auditor addressed these deficiencies by adopting HILs and EILs representative of the natural clay soils present at the PBR site. A summary of the lab data provided by the Alliance 2019 DSI for these soils is provided in **Table 2-6**.

Table 2-6 Summary of Alliance 2019 DSI Intrinsic Sample Data for Natural Soils at PBR Site

Location	Depth (m)	Soil description	Conductivity (µS/cm)	pH	CEC (cmol(+)/kg) [1]
TP01	1.0-1.2	Clay	56.0	6.4	30
TP03	0.8-1.0	Clay	190.0	5.0	30
TP03A	0.6-0.8	Clay	66.0	6.7	30
TP05	0.5-0.6	Clay	110.0	5.0	30
TP05	0.9-1.0	Clay	98.0	4.6	30
TP06	0.0-0.2	Clay	160.0	4.8	30
TP06	0.3-0.5	Clay	56.0	5.1	30
TP7	0.8	Clay	36.0	5.3	30
TP7	1.3	Clay	43.0	5.3	30
TP8	0.8	Clay	260.0	8.6	30
TP8	1.3	Clay	590.0	7.3	30
TP9	0.8	Clay	230.0	7.8	30
TP9	1.3	Clay	380.0	7.6	30
TP10	0.8	Clay	110.0	4.8	30
TP10	1.3	Clay	89.0	5.9	30
TP11	0.3	Clay	56.0	4.6	30
TP11	0.8	Clay	28.0	5.1	30
TP11	1.3	Clay	140.0	5.1	30
TP12	2.3	Clay	130.0	5.2	30
TP12	2.8	Clay	48.0	4.8	30
TP12	3.2	Clay	47.0	4.7	30
		Average	**139.2**	**5.7**	**30**
Notes:					
(1)	cmol(+)/kg = meq/100 g				
(2)	Typical value for clay soil from https://soilquality.org.au/factsheets/cation-exchange-capacity and https://www.dpi.nsw.gov.au/agriculture/soils/guides/soil-nutrients-and-				

The adopted soil properties for Site soils used to derive the SILs were: Soil type: clay; clay content ≥10%; soil depth 0 - <1m; pH = 5.7; Cation Exchange Capacity (**CEC**) = 30 cmol/kg.

The natural soil samples that were laboratory tested by the Alliance 2019 DSI were used to derive background heavy metal concentrations, with a summary of the data provided in **Table 2-7**.

Table 2-7 Summary of Alliance 2019 DSI Heavy Metal Sample Data for Natural Soils at PBR Site

Location	Depth (m)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Note
TP01	1.0-1.2	8.5	26.0	<5	30	6.8	69	
TP03	0.8-1.0	7.5	26.0	<5	21	9.4	16	
TP03A	**0.6-0.8**	**12.0**	**32.0**	**18**	**97**	**<5**	**220**	**1**
TP04	0.6-0.7	8.5	23.0	<5	17	<5	<5	
TP04	1.2-1.3	10.0	23.0	7.2	20	<5	<5	
TP04A	0.8-0.9	11.0	61.0	<5	16	<5	7	
TP05	0.5-0.6	5.3	16.0	<5	10	<5	5.2	
TP05	0.9-1.0	8.2	19.0	7.6	10	<5	<5	
TP06	0.0-0.2	12.0	30.0	6.5	18	<5	11	
TP06	0.3-0.5	<2	7.5	<5	11	<5	<5	
TP7	0.8	<2	<5	<5	7.3	<5	<5	
TP7	1.3	<2	<5	<5	11	<5	<5	
TP8	**0.8**	**42.0**	**16.0**	**110**	**370**	**12**	**800**	**1**
TP8	1.3	9.2	17.0	14	18	<5	15	
TP9	0.8	6.3	16.0	<5	26	<5	12	
TP9	1.3	13.0	27.0	6	23	<5	10	
TP10	0.8	13.0	37.0	<5	15	<5	23	
TP10	1.3	6.6	17.0	5.6	21	<5	34	
TP11	0.3	43.0	22.0	13	20	<5	16	
TP11	0.8	4.1	<5	<5	9.5	<5	<5	
TP11	1.3	<2	5.2	6.6	12	<5	6.5	
TP12	2.3	14.0	32.0	<5	16	<5	<5	
TP12	2.8	4.3	11.0	<5	11	<5	<5	
TP12	3.2	7.9	14.0	<5	15	<5	<5	
BH01	0.2-0.4	22.0	22.0	<5	34	<5	<5	
BH01	1.0-1.2	8.6	12.0	<5	19	<5	<5	
BH02	1.9-2.1	10.0	32.0	14	40	21	150	
BH02	2.7-2.9	11.0	34.0	16	35	21	150	
BH13	1.9-2.1	3.8	17.0	<5	10	<5	6	
BH14	1.0-1.2	8.3	25.0	8.4	160	<5	42	
BH15	0.6-0.8	8.7	150.0	150	23	13	96	
BH16	1.8-2.0	3.9	19.0	10	15	<5	12	
BH17	**1.5-1.7**	**11.0**	**170.0**	**200**	**35**	**27**	**98**	**1**
BH19	0.6-0.8	10.0	35.0	<5	19	<5	5.3	
		9	**25**	**10**	**23**	**4.4**	**23**	
Notes:								
(1)	Potential contamination of natural soil - sample data not used to establish background conditions							
(2)	Half detection limit used for non-detect results							

A summary of the SILs used by the Site Auditor for assessing contamination risks at the PBR site is provided in **Table 2-9**.

Table 2-9: Soil Investigation Levels

<table>
<tr><th rowspan="2">Substances</th><th colspan="3">HILs (mg/kg)</th><th rowspan="2">Commercial / Industrial D EILs (mg/kg)</th></tr>
<tr><th>Residential A</th><th>Recreational C</th><th>Commercial / Industrial D</th></tr>
<tr><td colspan="5">Metals / Metalloids (in clay)</td></tr>
<tr><td>Arsenic (total)</td><td>100</td><td>300</td><td>3,000</td><td>160</td></tr>
<tr><td>Cadmium</td><td>20</td><td>90</td><td>900</td><td>10 (4)</td></tr>
<tr><td>Chromium (III)</td><td>--</td><td>--</td><td>--</td><td>685</td></tr>
<tr><td>Chromium (VI)</td><td>100</td><td>300</td><td>3,600</td><td>--</td></tr>
<tr><td>Copper</td><td>6,000</td><td>17,000</td><td>240,000</td><td>330</td></tr>
<tr><td>Lead</td><td>300</td><td>600</td><td>1,500</td><td>1,800</td></tr>
<tr><td>Mercury (inorganic)</td><td>40</td><td>80</td><td>730</td><td>6.6 (4)</td></tr>
<tr><td>Nickel</td><td>400</td><td>1,200</td><td>6,000</td><td>604</td></tr>
<tr><td>Zinc</td><td>7,400</td><td>30,000</td><td>400,000</td><td>523</td></tr>
<tr><td colspan="5">Other Organics</td></tr>
<tr><td>Aldrin + Dieldrin</td><td>6</td><td>10</td><td>45</td><td>--</td></tr>
<tr><td>Chlordane</td><td>50</td><td>70</td><td>530</td><td>--</td></tr>
<tr><td>Chlorpyriphos</td><td>160</td><td>250</td><td>2,000</td><td>--</td></tr>
<tr><td>DDT+DDD+DDE</td><td>240</td><td>400</td><td>3,600</td><td>640</td></tr>
<tr><td>Heptachlor</td><td>6</td><td>10</td><td>50</td><td>--</td></tr>
<tr><td>PAHs (total)</td><td>300</td><td>300</td><td>4,000</td><td>--</td></tr>
<tr><td>Benzo(a)pyrene</td><td>3
(BaP TEQ)</td><td>3
(BaP TEQ)</td><td>40
(BaP TEQ)</td><td>1.4 (1)</td></tr>
<tr><td>Phenol
(as pentachlorophenol)</td><td>100</td><td>120</td><td>660</td><td>--</td></tr>
<tr><td>PCBs (total)</td><td>1</td><td>1</td><td>7</td><td>--</td></tr>
<tr><td colspan="5">Petroleum Hydrocarbons (in sand or silt 0 to <1m)</td></tr>
<tr><td>TRH F1</td><td colspan="2">40</td><td>310</td><td>215</td></tr>
<tr><td>TRH F2</td><td colspan="2">110</td><td>1,000</td><td>170</td></tr>
<tr><td>TRH F3</td><td colspan="2">2,500</td><td>5,000</td><td>2,500</td></tr>
<tr><td>TRH F4</td><td>6,300 (2)</td><td>7,400 (2)</td><td>10,000</td><td>6,600</td></tr>
<tr><td>Benzene</td><td colspan="2">0.5</td><td>4</td><td>95</td></tr>
<tr><td>Toluene</td><td colspan="2">160</td><td>NL</td><td>135</td></tr>
<tr><td>Ethyl Benzene</td><td colspan="2">55</td><td>NL</td><td>185</td></tr>
<tr><td>Xylenes (total)</td><td colspan="2">40</td><td>NL</td><td>95</td></tr>
<tr><td>Naphthalene</td><td colspan="2">3</td><td>NL</td><td>370</td></tr>
<tr><td colspan="5">Chlorinated solvents (USEPA RSLs)</td></tr>
<tr><td>Trichloroethylene</td><td colspan="2">0.94</td><td>6.0</td><td>--</td></tr>
<tr><td>1,1-Dichloroethylene</td><td colspan="2">120</td><td>1,000</td><td>--</td></tr>
<tr><td>Tetrachloroethylene</td><td colspan="2">24</td><td>100</td><td>--</td></tr>
<tr><td>Vinyl chloride</td><td colspan="2">0.059</td><td>1.7</td><td>--</td></tr>
<tr><td colspan="5">Asbestos</td></tr>
<tr><td>FA & AF (friable asbestos)</td><td colspan="3">0.001% w/w</td><td>--</td></tr>
<tr><td>Bonded ACM</td><td>0.01% w/w</td><td>0.02% w/w</td><td>0.05% w/w</td><td>--</td></tr>
<tr><td>All forms of asbestos</td><td colspan="3">No visible asbestos for surface soil</td><td>--</td></tr>
</table>

Legend:

Applicable SILs for PBR site

Notes:

(1) As given in NEPM erratum at http://nepc.gov.au/system/files/pages/622ffd38-f121-4daf-9ef3-ed7d40af68f2/files/asc-nepm-errata-30april2014.pdf
(2) Direct contact criteria given in Table 4, CRC CARE Technical Report No. 10
(3) BaP TEQ = Benzo(a)pyrene toxicity equivalent
(4) Canadian (Sept 2007) soil quality guideline

2.5.3 Surface and 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'.*

Prior to 2018, the EPA had endorsed the use of the water quality trigger levels given in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). These guidelines provided criteria for aquatic ecosystems (marine and fresh waters), primary industries, recreational water and drinking water. These guidelines were superseded on 29/08/18 by the Australian New Zealand 2018 water quality guidelines (**ANZG**), which was regularly updated online. The NHMRC *"Australian Drinking Water Guidelines"* (**ADWG**) were also regularly updated with the latest version at the time of this SAR was issued dated January 2022.

The NEPM (2013) guidelines[16] also advise 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 2.4.2**, the potential receptors of surface or groundwater contamination that needed to be considered at the PBR site were:

- Marine aquatic ecosystems in Johnsons Creek, Rozelle Bay and the Parramatta River;
- Recreational (i.e. non-potable) use of extracted groundwater and surface water at the Site and off-site; and
- Irrigation use of extracted groundwater and surface water at the Site and off-site.

No surface water bodies were located within or near the PBR site. The groundwater criteria adopted by the Alliance 2019 DSI[17] were the marine and freshwater criteria specified in the ANZECC & ARMCANZ (2000) guidelines, which were superseded by the ANZG (2018) guidelines. No criteria were specified for potential irrigation or recreational receptors of migrating or extracted groundwater from the PBR site.

The Site Auditor addressed these deficiencies by adopting the latest criteria available in July 2021, which included the US EPA (May 2022) RSLs. The criteria adopted covered:

- Marine aquatic ecosystems: The 95% freshwater protection levels from the ANZG values as defined by their website and 99% protection levels for contaminants that were bioaccumulative;
- Recreational water: Criteria derived by multiplying the ADWG criteria by a factor of 10, as recommended by the NEPM (2013) guidelines[18]; and
- Irrigation Water criteria given by the long-term irrigation levels given in the ANZECC & ARMCANZ (2000) guidelines.

A summary of the criteria used by the Site Auditor for assessing groundwater quality at the PBR site is provided in **Table 2-10**. Note that freshwater criteria provided by the ANZG criteria were used where marine water criteria were not available.

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16 Refer Section 3.5 in NEPM (2013) "*Schedule B6 Guideline on The Framework for Risk-Based Assessment of Groundwater Contamination*"
17 Section 10.4, Ref [5]
18 Section 2.8 in Schedule B1, NEPM (2013)

Table 2-10: Groundwater Investigation Levels

Substances	Marine water protection levels (1) (µg/L)	Irrigation criteria (6) (µg/L)	Recreational water criteria (5) (µg/L)
Metals			
Arsenic (V)	13	100	100
Cadmium	0.7	10	20
Chromium (III)	27	100	220,000 (3)
Chromium (IV)	4.4		500
Copper	1.3	200	20,000
Lead	4.4	2,000	100
Mercury (inorganic)	0.1	2	10
Nickel	70	200	200
Zinc	15	2,000	na
Petroleum Hydrocarbons			
TRH (C6-C9)	150 (2)	--	--
TRH (C10-C36)	600 (2)	--	--
Benzene	700	--	10
Toluene	180	--	8,000
Ethylbenzene	80	--	3,000
Xylenes	75 - 350	--	6,000
PAHs			
Naphthalene	70	--	1.2 (3)
Anthracene	PQL (0.1)	--	18,000 (3)
Fluoranthene	1.0	--	8,000 (3)
Phenanthrene	0.6	--	--
Benzo(a)pyrene	0.1	--	PQL (0.01)
Organochlorine Pesticides			
Aldrin	PQL (0.01)	--	PQL (0.01)
Chlordane	PQL (0.01)	--	20
DDT	PQL (0.01)	--	90
Dieldrin	0.01	--	PQL (0.01)
Heptachlor	PQL (0.01)	--	PQL (0.01)
Organophosphate Pesticides			
Chlorpyrifos	PQL (0.01)	--	100
Fenitrothion	PQL (0.01)	--	70
Glyphosate	PQL (0.01)	--	10,000
Malathion	0.05	--	700
Parathion	PQL (0.01)	--	200
Nutrients			
Ammonia (as NH_3)	910	--	5,000
Chlorine	na	--	6,000
Nitrate	na	--	50,000
Total phosphorus (2)	na	--	--
Other Chemicals			
PCBs	0.01-0.3		PQL (0.01)
Chloroethylene (vinyl chloride)	100	--	0.19 (3)
1,1,2-Trichloroethylene	330	--	4.9 (3)
1,1,2,2-Tetrachloroethylene	70		110 (3)

Notes

(1) Marine water protection levels from ANZG guidelines wherever available, otherwise freshwater criteria were used

(2) Dutch (2000) Intervention Level

(3) US EPA RSLs – tapwater criteria (with target cancer risk 1×10^{-6} and hazard quotient of 1) multiplied by 10

(4) NHMRC drinking water criteria (health) used wherever possible. Aesthetic criteria not considered since the water use was recreational
(5) ANZECC (2000) LTVs for long-term use (up to 100 years) used for irrigation water criteria where possible
(6) PQL = Practical quantification limit

2.5.4 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*'.

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[19], which provided additional soil vapour criteria for protecting an intrusive maintenance worker in a shallow trench.

No vapour criteria were provided by the Alliance 2019 DSI for petroleum hydrocarbons. The Site Auditor addressed this data gap by adopting the most conservative (i.e. lowest set of Category D criteria, which corresponded to sandy soils at the ground surface).

For the purpose of this audit, the Site Auditor derived soil vapour criteria using the following conservative assumptions: Soils were sand; 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 for the relevant analytes provided in the guidelines is provided in **Table 2-11**.

[19] 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 2-11: Soil Vapour Criteria from NEPM & CRC CARE Guidelines

Contaminant	Commercial / Industrial D	Intrusive Maintenance Worker (Shallow Trench)
Soil vapour (mg/m^3)		
Toluene	4,800	NL
Ethylbenzene	1,300	NL
Xylenes	840	NL
Benzene	4	3,900
Naphthalene	3	NL
F1	680	NL
F2	500	NL
Soil (mg/kg)		
Toluene	NL	NL
Ethylbenzene	NL	NL
Xylenes	230	NL
Benzene	3	77
Naphthalene	NL	NL
F1	250	NL
F2	NL	NL
Groundwater (mg/L)		
Toluene	NL	NL
Ethylbenzene	NL	NL
Xylenes	NL	NL
Benzene	5	NL
Naphthalene	NL	NL
F1	6	NL
F2	NL	NL

Legend: NL = No limit

2.6 Review of Investigation Data Quality

2.6.1 Overview

Soil investigation data from the PBR site were provided in the SESL 2019 PSI (Ref [2]), the SESL 2019 DSI (Ref [4]) and the Alliance 2019 DSI (Ref [5]). The scope of field and laboratory work undertaken at 79 PBR comprised:

- A site inspection conducted by SESL on 13/09/18 for the PSI (Ref [2])
- The SESL 2019 DSI:
  - Drilled 12 boreholes across the area (BH1 - BH12) to depths of 0.6 – 2.5 mbgl. Three of these boreholes (BH9, BH10, BH12) were located near the two known USTs and drilled to 2.4–2.7mbgl. Another borehole (BH3) was located near a third suspected UST and drilled to 1.9 and 1.3 mbgl, respectively;
  - PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern; and
  - Installed nine sub-slab vapour pins (SV01 – SV09) in the concrete slab that covered the area prior to its removal and the monitoring of soil vapour.
- The Alliance 2019 DSI:
  - Drilled 2 boreholes (BH05, BH20) to depths of 2.7 and 0.9 mbgl respectively;

- PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern; and
- Construction of a groundwater monitoring well (BH05/GW05) but it was not monitored prior to being destroyed.

The scope of field and laboratory work undertaken at the Stage 2 area comprised:

- A site inspection conducted by SESL on four of the eight properties in the Stage 2 area on 18/10/18 (Ref [3]);
- The Alliance 2019 DSI:
  - Drilled 11 boreholes (BH01 – BH03, BH13 – BH15, BH17, BH19, BH21A, BH21B, BH21C) to depths of 0.8 – 4.3 mbgl;
  - Excavated 14 test pits (TP01 – TP12, TP03A, TP04A) to depths of 0.7 - 3.2 mbgl;
  - PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern;
  - UST validation samples Tank01-01 to Tank01-05 tested for COPCs;
  - Construction of 2 groundwater monitoring wells (BH01/GW01, BH02/GW02) with screens at 1.0 - 1.8 mbgl and 2.2 – 4.2 mbgl, respectively; and
  - Gauging, sampling and laboratory testing of a groundwater sample from well BH02/GW02 on 14/03/19.

The scope of field and laboratory work undertaken by the Alliance 2019 DSI along Bignell Lane comprised:

- Drilled 3 boreholes (BH04, BH06, BH16) to depths of 1.8 – 2.3 mbgl;
- PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern;
- Construction of 2 groundwater monitoring wells (BH04/GW04, BH06/GW06) with screens at 1.0 - 1.7mbgl and 1.0 – 2.0 mbgl, respectively; and
- Gauging, sampling and laboratory testing of groundwater samples from the two wells on 14/03/19.

2.6.2 Fieldwork Documentation

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

The Site Auditor considered the fieldwork documentation provided by the ESAs was close to meeting the documentation completeness DQO for the scope of work completed. Deficiencies identified were:

- The elevation at the top of groundwater monitoring wells was not surveyed;
- Records of groundwater well development, purging and sampling were not provided;
- The Alliance 2019 DSI did not provide test pit logs for TP02B and TP20C; and
- Some of the borehole and test pit logs[20] provided by the Alliance 2019 DSI were not checked.

The Site Auditor assessed the significance of these deficiencies on the assessment of contamination risks in **Sections 2.7 – 2.13**.

[20] Logs for BH02/GW02, BH16, BH17, BH19, BH21A, BH21B and BH21C

Table 2-12: Summary of Fieldwork Documentation

Fieldwork Documentation	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
Sampling location plan	Fig 4	Figs 4 & 5
Investigation and soil sampling techniques	Appn B	Sectns 6.7.2 & 7.1
Groundwater well construction	Not constructed	Sectn 7.6
Groundwater sampling techniques	--	Sectn 7.7
Ground gas probe construction & sampling techniques	Sectn 5.2, Appn B; Sectn 1.1, Appn C	Sectn 6.7.4
Borehole / well construction logs	Appn A	**Appn C**
Groundwater well collar surveyed	--	**Not performed**
Decontamination procedures	Sectn 5.2.9, Appn B	Sectn 6.7.5
Headspace/borehole volatile gas measurements using PID	Sectn 5.2.5, Appn B	Sectns 6.7.4 & 7.3.1
Calibration records for field equipment	Sectn 5.2, Appn B; Sectn 1.1, Appn C; Appn F	Appns D & E
Well development procedures and field records	--	**Not provided**
Sample preservation methods	Sectn 5.2.10, Appn B	Sectn 6.7.3
Description of field screening protocols	Sectn 5.2.5, Appn B	Sectns 6.7.1 & 6.7.2
Use of a NATA-registered chemical laboratory/ies	Appn C	Sectns 6.5 & 6.7

Legend:

Inadequate information provided in investigation reports

2.6.3 Laboratory Documentation

A summary of the laboratory documentation provided by the ESAs is presented in **Table 2-13**.

Table 2-13: Summary of Laboratory Documentation

Laboratory Documentation	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
A copy of the chain-of-custody forms acknowledging receipt of date and time, and identity of samples included in shipments	Appn E	Sectns 6.7.3, 8 & Appn F
Laboratory test certificates	Appn E	Appn F
Description of the surrogates and spikes used	Appn E	Sectn 6.5.2 & Appn F
Record of holding times and a comparison with method specifications	Appns C & E	Sectn 6.7.8 & Appn F
Analytical test methods used by the NATA-registered laboratory	Appns C & E	Sectns 6.5, 6.7 & Appn F
Laboratory accreditation for analytical methods used	Appns C & E	Sectns 6.7.6 & 6.7.7

Legend:

Inadequate information provided in investigation reports

The Site Auditor considered the laboratory testing documentation provided by the ESAs met or was close to meeting the documentation completeness DQO for the scope of work completed.

2.6.4 Contamination Assessment Documentation

A summary of the contamination assessment documentation provided by the ESAs is provided in **Table 2-14**. Copies of the available figures and data summary tables are provided in **Appendix A** to this report.

Table 2-14: Summary of Contamination Assessment Documentation

Assessment Documentation	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
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 A1 – A4	Tables LAR1 – LAR3
Summary of PID data	Appn A	Appn C
Statistical analysis of the soil contamination data	**Not performed**	Appn G
Site plans showing all sample locations, sample identification numbers and sampling depths	Fig 4	Figs 4 & 5
Hydrogeological assessment & site plans showing groundwater equipotential levels	**Not provided**	**Not provided**
Site plans showing the extent of soil, groundwater and ground vapour contamination exceeding selected assessment criteria for each sample depth	**Not provided**	Figs 6 - 8
Assessment of aesthetically impacted materials across Site	Sectns 10 & 11.2.1	Sectn 10.5 & Fig 6
Assessment of ASS risks	Sectn 4.4	--
Soil contamination assessment (e.g. contaminants of concern, contaminant sources, magnitude of contamination, extent of contamination, risk to receptors)	Sectn 11.2	Sectns 10.1 – 10.3, 10.6
Groundwater contamination assessment (e.g. contaminants of concern, contaminant sources, magnitude of contamination, presence of NAPL, extent of plumes, fate & transport, attenuation potential, risk to receptors)	--	Sectn 10.4
Soil vapour risks	Sectn 11.3	Sectns 10.2 & 10.6

Legend:

Inadequate information provided in investigation reports

The Site Auditor considered the contamination assessments provided by the ESAs were close to meeting the documentation completeness DQO for the scope of work completed. Deficiencies identified were:

- Statistical analysis of soil data not provided not provided by the SESL 2019 DSI (Ref [4]);
- Hydrogeological assessment and site plans showing groundwater equipotential levels not provided by any ESA.
- Detailed assessments were not provided by any of the ESAs into:
  - The nature and extent of asbestos and heavy metal contamination in the fill layer;
  - The nature and extent of petroleum hydrocarbon contamination from spills / leaks at the USTs; and
  - The nature and extent of heavy metal contamination in groundwater.

The Site Auditor assessed the significance of these deficiencies in **Sections 2.7 – 2.13**.

2.6.5 Data Completeness and Representativeness

2.6.5.1 Soil Contamination

Summaries of the total number of soil samples (excluding QA samples) chemically tested for the various soil media by the ESAs at 79 PBR, the Stage 2 area and Bignell Lane are provided in **Tables 2-15** to **2-17**.

Table 2-15: Summary of Lab Tests on Soil Samples from 79 PBR

Location	Sample Depth (m)	Heavy metals (1)	TRH	BTEX	PAHs	Phenols	OCPs	OPPs	PCBs	Asbestos	VOCs/ VHCs
Fill (APEC 1, 3, 10)											
SESL 2019 DSI											
BH1	0.1-0.2, 0.4-0.5, 0.9-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH2	0-0.1, 0.2-0.3, 0.4-0.7, 0.8-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH3	0-0.2, 0.3-0.4, 0.6-0.8, 0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4	0-0.1, 0.4-0.5, 0.6-0.7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH5	0-0.1, 0.5-0.7, 1.0-1.2, 1.3-1.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH6	0-0.1, 0.2-0.3, 1.0-1.3, 1.8-2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH7	0-0.15, 0.5-0.7, 1.3-1.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8	0-0.1, 0.4-0.6, 0.9-1.1, 2.0-2.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH9	0-0.1, 0.4-0.6, 1.0-1.2, 1.3-1.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10	0-0.15, 0.9-1.1, 1.3-1.5, 1.9-2.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH11	0-0.1, 0.2-0.4, 0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH12	0-0.1, 0.9-1.1, 1.2-1.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alliance 2019 DSI											
BH05	0-0.2	✓									
BH20	0-0.2	✓	✓	✓	✓						
TOTALS		**14**	**13**	**13**	**13**	**12**	**12**	**12**	**12**	**12**	**12**
Natural soil (APEC 3, 5 – 8, 10)											
SESL 2019 DSI											
BH1	1.6-1.7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH7	2.2-2.4	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH12	2.2-2.4	✓	✓	✓	✓	✓	✓	✓	✓		✓
Alliance 2019 DSI											
BH20	0.7-0.9	✓									
TOTALS		**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**1**	**3**
Fill at Furnace & Chimney (APEC 9)											
TOTALS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Shallow Soils at Two Known USTs (APEC 2)											
SESL 2019 DSI											
BH9	0-0.1, 0.4-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH10	0-0.15, 0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Location	Sample Depth (m)	Heavy metals (1)	TRH	BTEX	PAHs	Phenols	OCPs	OPPs	PCBs	Asbestos	VOCs/ VHCs
BH11	0-0.1, 0.2-0.4, 0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH12	0-0.1, 0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TOTALS		**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
Deeper Soils at Base of Two Known USTs (APEC 2)											
SESL 2019 DSI											
BH10	1.9-2.1	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH12	2.2-2.4	✓	✓	✓	✓	✓	✓	✓	✓		✓
TOTALS		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**0**	**2**
Shallow Soils at Suspect UST (SE Corner) (APEC 2)											
SESL 2019 DSI											
BH3	0-0.2, 0.3-0.4, 0.6-0.8, 0.9-1.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TOTALS		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Deeper Soils at Base of Suspect UST (SE Corner) (APEC 2)											
TOTALS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Soils Near Buried Services (APEC 11)											
TOTALS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: 1. The heavy metals comprise As, Cd, Cr, Cu, Hg, Ni, Pb & Zn.

Legend:

Sampling frequency less than EPA guidance

Table 2-16: Summary of Lab Tests on Soil Samples from Stage 2 Area

Location	Sample Depth (m)	Heavy metals (1)	TRH	BTEX	PAHs	Phenols	OCPs	OPPs	PCBs	Asbestos	VOCs/ VHCs
Fill (APEC 1, 3, 10)											
Alliance 2019 DSI											
BH01	0-0.2	✓	✓	✓	✓						
BH02	0.2-0.4, 1.0-1.2	✓	✓	✓							
BH03	0.15-0.3, 0.6-0.8	✓	✓	✓	✓						
BH13	0-0.2, 0.8-1.0, 1.5-1.7, 1.9-2.1	✓	✓	✓			✓				
BH14	0-0.2, 0.7-0.9	✓	✓	✓			✓				
BH15	0.2-0.4	✓	✓	✓	✓			✓			
BH17	0.2-0.4, 0.9-1.1	✓	✓	✓							
BH19	0-0.2	✓	✓	✓							
BH21A	0-0.2	✓									
BH21B	0.05-0.2	✓									
BH21C	0-0.2	✓									
TP01	0-0.2, 0.4-0.6	✓	✓	✓	✓		✓			✓	✓
TP02, TP02B, TP02C	0-0.2, 0.4-0.6, 0.7-0.9	✓	✓	✓	✓		✓			✓	✓

Location	Sample Depth (m)	Heavy metals [1]	TRH	BTEX	PAHs	Phenols	OCPs	OPPs	PCBs	Asbestos	VOCs/ VHCs
TP03	0-0.2, 0.5-0.7	✓	✓	✓	✓		✓			✓	✓
TP03A	0-0.2, 0.4-0.6	✓	✓	✓	✓		✓			✓	
TP04	0.1-0.3, 0.4-0.5	✓	✓	✓	✓		✓			✓	
TP04A	0.1-0.3, 0.6-0.7	✓	✓	✓	✓		✓			✓	
TP05	0.1-0.3	✓	✓	✓	✓		✓			✓	✓
TP07	0.3	✓	✓	✓	✓		✓		✓		✓
TP08	0.3	✓	✓	✓	✓				✓		
TP09	0.3, 0.4	✓	✓	✓	✓		✓		✓		
TP10	0.3	✓	✓	✓	✓		✓		✓		
TP12	0.3, 0.8, 1.3, 1.8	✓	✓	✓	✓		✓		✓		
TOTALS		**23**	**20**	**20**	**15**	**0**	**13**	**0**	**5**	**7**	**5**
Natural soil (APEC 3, 5 – 8, 10)											
BH01	0.2-0.4, 1.0-1.2	✓									
BH02	1.9-2.1, 2.7-2.9	✓									
BH14	1.0-1.2	✓									
BH15	0.6-0.8	✓									
BH17	1.5-1.7	✓									
BH19	0.6-0.8	✓									
BH21A	0.7-0.9	✓									
BH21B	0.7-0.9	✓									
BH21C	1.3-1.5	✓									
TP01	1.0-1.2	✓									
TP03	0.8-1.0	✓									
TP03A	0.6-0.8	✓									
TP04	0.6-0.7, 1.2-1.3	✓	✓	✓	✓						
TP04A	0.8-0.9	✓	✓	✓	✓						
TP05	0.5-0.6, 0.9-1.0	✓	✓	✓	✓					✓	
TP06	0-0.2, 0.3-0.5	✓	✓	✓	✓		✓				
TP07	0.8, 1.3	✓	✓	✓	✓				✓		✓
TP08	0.8, 1.3	✓	✓	✓	✓				✓		
TP09	0.8, 1.3	✓	✓	✓	✓				✓		
TP10	0.8, 1.3	✓	✓	✓	✓				✓		
TP11	0.3, 0.8, 1.3	✓	✓	✓	✓		✓		✓		
TP12	2.3, 2.8, 3.2	✓	✓	✓	✓						
TOTALS		**22**	**10**	**10**	**10**	**0**	**2**	**0**	**5**	**1**	**1**
Shallow Soils at Central UST (APEC 2)											
Tank01-01 to Tank01-05		✓	✓	✓	✓						
TOTALS		**5**	**5**	**5**	**5**						
Shallow Soils at Eastern UST (APEC 2)											
TOTALS		**0**	**0**	**0**	**0**						
Deeper Soils at Base of Central & Eastern USTs (APEC 2)											
TOTALS		**0**	**0**	**0**	**0**						
Soils Near Buried Services (APEC 11)											
TOTALS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: 1. The heavy metals comprise As, Cd, Cr, Cu, Hg, Ni, Pb & Zn.

Legend:

Sampling frequency less than EPA guidance

Table 2-17: Summary of Lab Tests on Soil Samples from Bignell Lane

Location	Sample Depth (m)	Heavy metals (1)	TRH	BTEX	PAHs	Phenols	OCPs	OPPs	PCBs	Asbestos	VOCs/ VHCs
Fill (APEC 1, 3, 11)											
BH04	0.15-0.3, 0.7-0.9, 1.3-1.5	✓	✓	✓	✓						
BH06	0.2-0.4	✓									
BH16	0.1-0.3, 0.6-0.8, 1.3-1.5	✓	✓	✓	✓						
TOTALS		**3**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**
Natural Soil (APEC 3, 5 – 8, 10)											
BH16	1.8-2.0	✓									
TOTALS		**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Soils Near Buried Services (APEC 11)											
TOTALS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: 1. The heavy metals comprise As, Cd, Cr, Cu, Hg, Ni, Pb & Zn.

Legend:

[red] Sampling frequency less than EPA guidance

The locations where soil samples were collected by the ESAs are shown in **Figure 2-9** for soil samples collected by the SESL 2019 DSI (Ref [4]) at 79 PBR, and **Figures 2-10** and **2-11** for soil samples collected by the Alliance 2019 DSI (Ref [5]) across the Site.

The Site Auditor considered the data completeness and representativeness DQOs required the sample frequencies and locations achieved at each APEC to meet EPA-guidance. These minimum requirements were:

- Fill layer (APEC 1, 3, 10, 11): The EPA (Sept. 1995) *'Contaminated Sites Sampling Guidelines'* recommended that contamination across the three area be characterised using the following minimum number of sample locations:
  - 79 PBR (0.26 ha): 8;
  - Stage 2 area (0.83 ha): 20; and
  - Bignell Lane (0.34 ha): 10.
- Natural soils (APEC 3, 5 – 8, 10): The natural soils underlying the fill layer could be validated at a lower frequency than that given by the EPA (Sept. 1995) *'Contaminated Sites Sampling Guidelines'* provided there was a low risk of migration of contamination from the overlying fill layer, no buried structures were present (e.g. USTs, buried pipes) that could be potential contaminant sources, and groundwater was not contaminated at levels that could impact soils.
- Furnace use and waste (APEC 9): The EPA (April 2014) "*Technical Note – Investigation of Service Station Sites*" recommended one sample per 25 m^2.
- USTs and associated infrastructure (APEC 2): The EPA (April 2014) "*Technical Note – Investigation of Service Station Sites*" recommended: USTs - a minimum two samples per tank or backfill and natural soils with samples taken at or below base of tank; Fuel feed lines to dispenser - one sample every 5 m of line; Remote fill points - one sample per fill point.
- Buried services (APEC 11): The EPA (April 2014) "*Technical Note – Investigation of Service Station Sites*" recommended buried services be sampled every 5 m of line.

Figure 2-9 Sample Locations Used by SESL 2019 DSI at 79 PBR Area (Source: Figure 4, Ref [4])

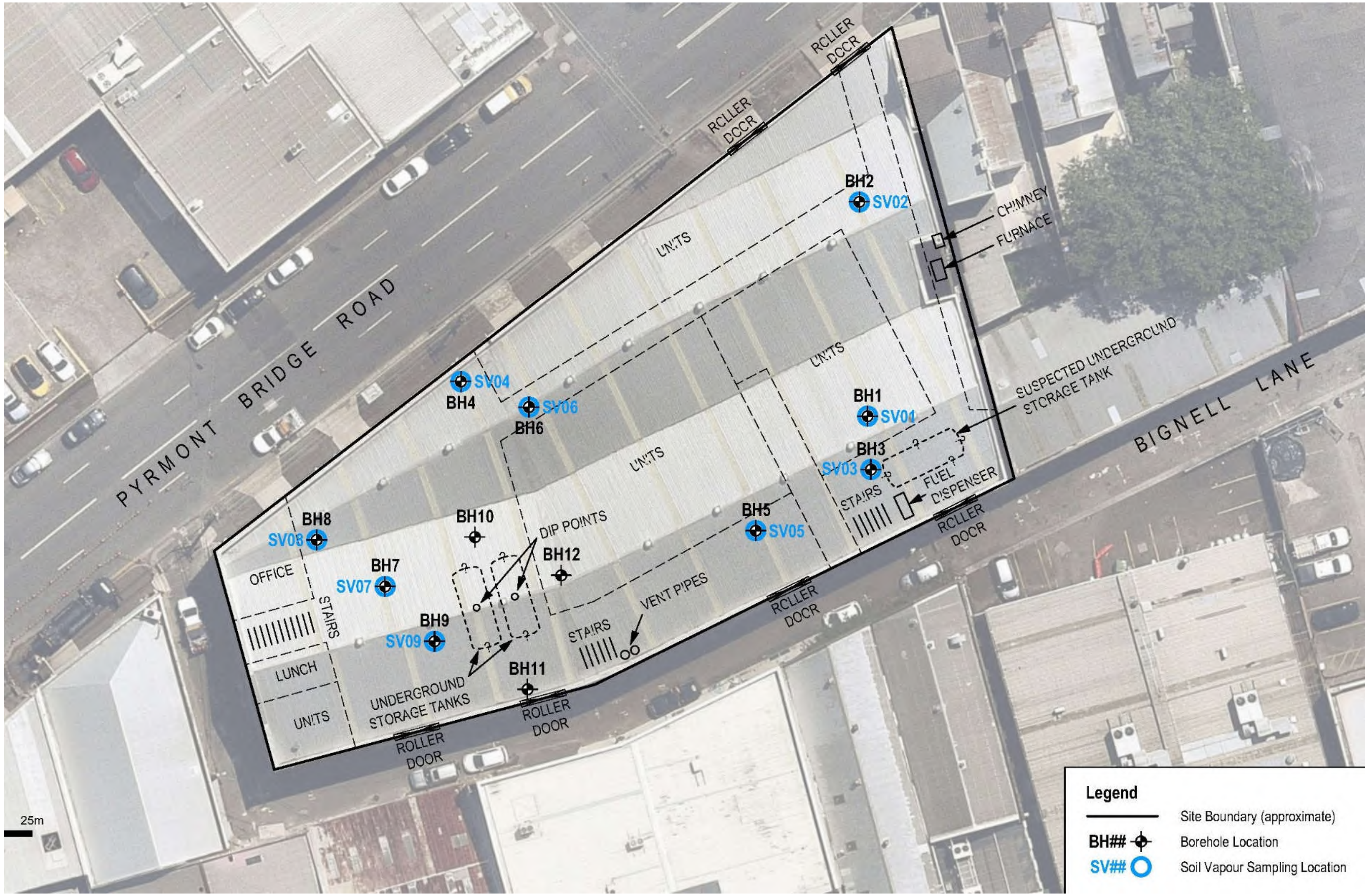


Figure 2-10 Sample Locations Used by Alliance 2019 DSI at PBR site (Source: Figure 4, Ref [5])

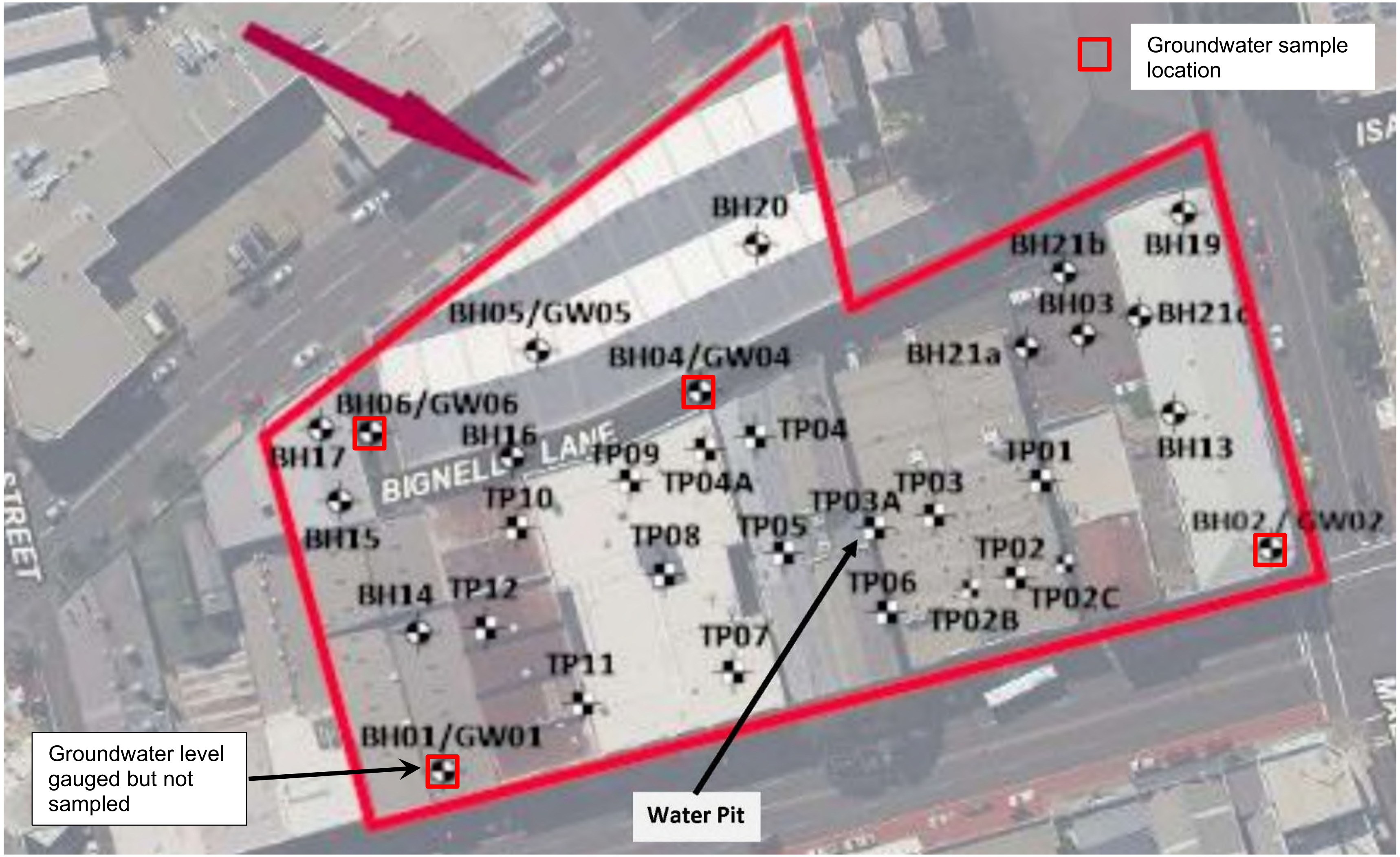
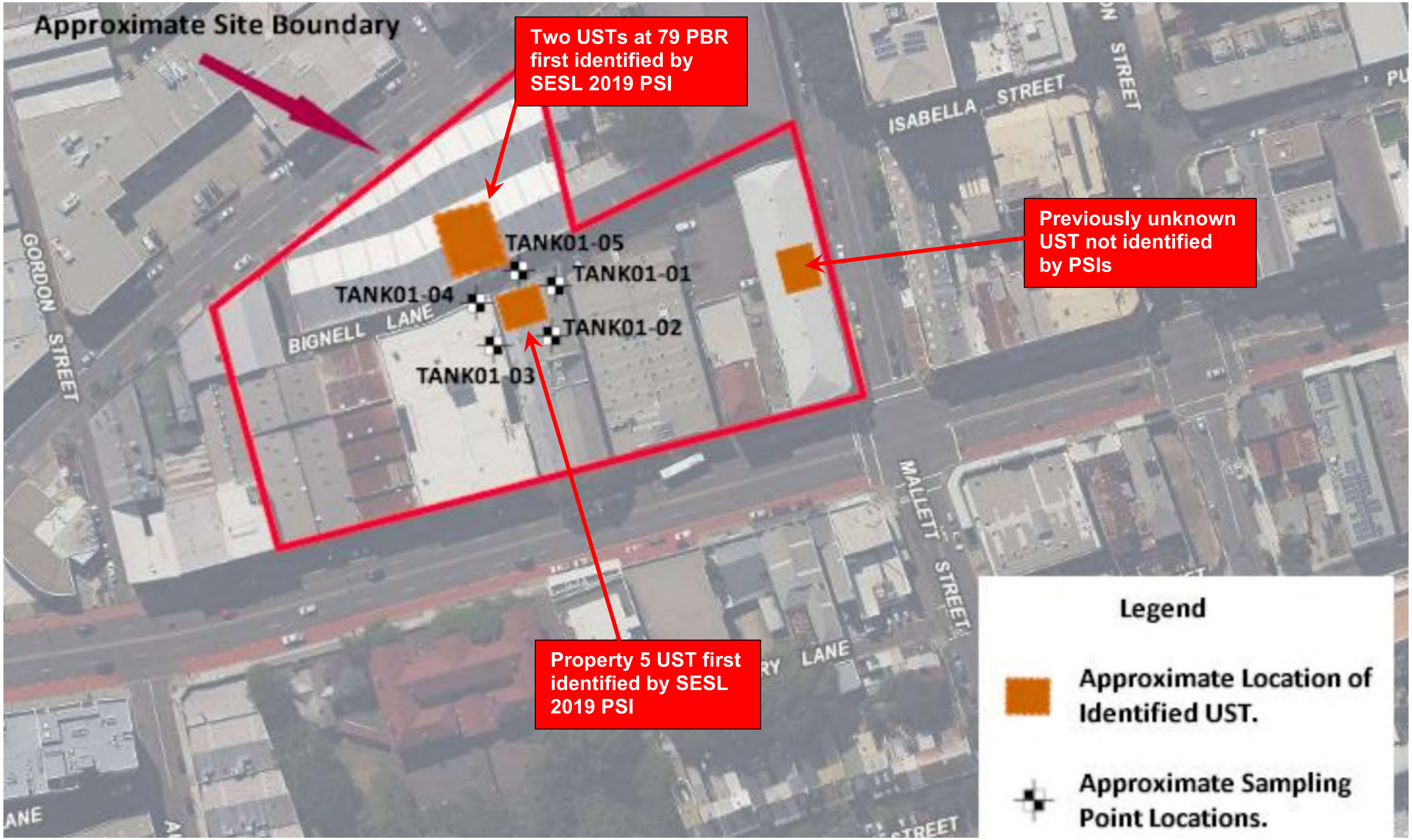


Figure 2-11 UST Sample Locations Used by Alliance 2019 DSI at PBR site (Source: Figure 5, Ref [5])



The Site Auditor considered the available laboratory test data for the 79 PBR area met or was close to meeting the minimum soil sampling requirements for most APECs and contaminants of concern. The exceptions were:

- Furnace and Chimney fill layer (APEC 9): No fill samples were collected and tested from this area (minimum requirement one sample per 25 m^2).
- Two known USTs (APEC 2): Insufficient deep soil samples were collected from near the base of the two known USTs (2 samples tested compared to a minimum requirement of 4).
- Suspect UST in SE Corner (APEC 2):
  - Insufficient shallow soil samples were collected from the area (1 sample tested compared to a minimum requirement of 2); and
  - No deep soil samples were collected from near the base of the suspect UST (Minimum requirement of 2).
- Soils near Buried Services: No fill samples were collected and tested along buried services (Minimum requirement one sample per 5 m of line).

The Site Auditor considered the available laboratory test data for the Stage 2 area met or was close to meeting the minimum soil sampling requirements for most APECs and contaminants of concern. The exceptions were:

- Fill (APEC 1, 3, 10): Insufficient fill samples were collected and tested for OCPs (13), PCBs (5), asbestos (3) and VOCs / VHCs (5) compared to a minimum requirement of 20;
- Central UST (APEC 2): No deep soil samples were collected from near the UST base;
- Eastern UST (APEC 2): No shallow or deep soil samples were collected near the UST; and
- Soils near Buried Services: No fill samples were collected and tested along buried services (Minimum requirement one sample per 5 m of line).

The Site Auditor considered the available laboratory test data for Bignell Lane did not meet or was close to meeting the minimum soil sampling requirements for most APECs and contaminants of concern because:

- Fill (APEC 1, 3, 10): Insufficient fill samples were collected and tested for all contaminants of concern, since only 0 – 3 sample locations were investigated compared to a minimum requirement of 10.
- Soils near Buried Services: No fill samples were collected and tested along buried services (Minimum requirement one sample per 5 m of line).

The Site Auditor assessed the significance of these deficiencies in soil sample testing when reviewing soil contamination risks in **Section 2.9**.

2.6.5.2 Surface Water

No sampling or testing of surface water was undertaken by the ESAs since no surface water bodies were presence at or near the PBR site.

2.6.5.3 Groundwater

The Alliance 2019 DSI constructed and gauged groundwater at 4 locations spread across the PBR site (BH01/GW01, BH02/GW02, BH04/GW04, BH06/GW06), as shown in **Figure 2-10**. Samples were collected on 14/03/19 and laboratory tested from 3 of these locations (not BH01/GW01), with a summary of the analytes tested provided in **Table 2-18**.

Table 2-18: Summary of Lab Tests on Groundwater Samples

Well	Metals	TPH / BTEX	PAHs	Phenols	VOCs / VHCs
GME 1 – 14/03/19					
BH02/GW02	✓	✓	✓	✓	✓
BH04/GW04	✓	✓	✓	✓	✓
BH06/GW06	✓	✓	✓	✓	✓

Minimum sampling requirements considered to meet EPA requirements are:

- Installation of a sufficient number of monitoring bores (minimum of 3) to enable triangulation of water levels across the site;
- All bores should penetrate the regional water table to an extent that will allow representative discrete samples to be collected from both shallow and deep groundwater, due to the potential for DNAPLs to be present;
- A minimum of one well should be located up-gradient of potential contaminant sources in order to provide information on background conditions;
- A minimum of one well should be 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 should be 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 is found, then install and test a sufficient number of groundwater wells so that the extent of any groundwater plume can be defined;
- Testing a minimum of one round of groundwater samples for the potential contaminants of concern. If contamination is found, then test a sufficient number of monitoring rounds to allow trends to be established for the potential contaminants of concern;
- If groundwater contamination is found and there is 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 potential contaminant of concern has a density greater than water;
- If a fate-and-transport assessment is required for assessing contamination risks, additional sampling rounds tested over a sufficient period of time need to be undertaken to establish trends and the plume behaviour;
- MNA parameters need to be tested to support a Monitored Natural Attenuation (MNA) assessment, if required; and
- Field tests to determine the hydraulic properties of the strata that form the hydrogeological system.

The Site Auditor considered the test data from the Alliance 2019 DSI was close to meeting the following minimum sampling requirements for groundwater at the PBR site:

- Four wells were installed and water levels gauged that allowed the triangulation of water levels across the Site;
- The three wells that were sampled penetrated the regional water table to an extent that allowed representative discrete samples to be collected from shallow groundwater above bedrock;
- Samples were collected from the three wells and tested for the contaminants of concern;

- Well BH06/GW06 was located in the NW corner of the Site up-gradient of potential contaminant sources and provided data on background groundwater quality;
- Well BH04/GW04 was located at close to and down-gradient of the two known USTs at 79 PBR and provided data on the potential groundwater contamination risks associated with USTs at the Site;
- Well BH02/GW02 was located down-gradient of the potential source zones on the down-gradient property boundary and provided data on migration potential of contamination, the quality of groundwater leaving the site and the likely presence of a groundwater plume; and
- The three groundwater monitoring wells did not detect any significant groundwater contamination so they were sufficient to establish that no significant contaminated groundwater plumes were present at the Site.

Deficiencies identified were:

- The absence of a groundwater monitoring well towards the centre of the Stage 2 area in the vicinity of TP02C, TP03A and TP04 where strong hydrocarbon odours/staining and/or sheen were reported by the Alliance 2019 DSI; and
- Three of the four groundwater wells[21] were short (<2.5 m) and may not have provided representative samples of the regional shallow groundwater quality.

The Site Auditor assessed the significance of these deficiencies in the groundwater sample testing when reviewing groundwater contamination risks in **Section 2.11**.

2.6.5.4 Ground Gas

The ground gas data collected by the ESAs indicated there was a low risk of ground gases being present at the PBR site that posed an unacceptable risk for a road construction worksite both during and at the end of construction and prior to landscaping by TfNSW for the reasons given in **Section 2.12**.

2.6.6 Data Comparability

A summary of the data comparability documentation provided by the ESAs is provided in **Table 2-19**.

Table 2-19: Summary of Data Comparability

Data Comparability	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
Appropriate grid-based asbestos survey	**Not performed**	**Not performed**
Appropriate field screening techniques	**Sectn 5.2.5, Appn B**	Sectns 6.7.1 & 6.7.2
Appropriate asbestos investigation techniques	**Not described**	**Not described**
Appropriate calibration of field equipment	Sectn 5.2, Appn B; Sectn 1.1, Appn C	Appns D & E
Appropriate soil sampling techniques	Sectn 5.2, Appn B; Sectn 1.1, Appn C	Sectns 6.7.2 & 7.1
Appropriate groundwater well construction techniques	--	**Sectn 7.6**
Appropriate groundwater sampling techniques	--	Sectn 7.7
Appropriate soil vapour sampling techniques	Sectn 5.2, Appn B; Sectn 1.1, Appn C	Sectn 6.7.4
Appropriate sample splitting techniques	Sectn 5.2.5; Sectn 1.1, Appn C	Sectn 6.5.3
Appropriate decontamination procedures	Sectn 5.2.9, Appn B; Sectn 1.1, Appn C	Sectn 6.7.5

[21] BH01/GW01 at 1.9 m, BH04/GW04 at 1.7 m and BH06/GW06 at 2.0 m

Data Comparability	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
Appropriate containers (including preservation) used for sampling	Sectn 5.2.10, Appn B; Sectn 1.1, Appn C	**Sectn 6.7.3**
Appropriate sample storage and transportation	Sectn 5.2.10, Appn B; Sectn 1.1, Appn C	**Sectn 6.7.3**
Appropriate management of chain of custody forms	Sectn 5.2; Sectn 1.1, Appn C; Appn E	Sectns 6.7.3, 8 & Appn F
Samples tested within recommended holding times	Sectn 1.2, Appn C	Sectn 6.7.8 & Appn F
Lab test methods complied with the 1999 NEPM Schedule B(3) Guideline & 2013 updated guideline	Sectn 1.2, Appn C	Sectns 6.5, 6.7 & Appn F
Appropriate PQL's for the analytes tested	Sectn 1.2, Appn C; Appn E	Appn F

Legend:

Inadequate information provided in investigation report

The Site Auditor considered that the data provided by the SESL 2019 DSI for 79 PBR did not meet the data comparability DQO because:

- A grid-based asbestos survey was not performed when the concrete ground slab / pavements were removed from across the Site;
- Three of the twelve boreholes (BH4, BH5, BH11) were shallow and did not penetrate through the fill layer;
- The borelogs did not identify soils as fill or natural;
- No description was provided explaining how soils that were excavated for test pits were examined for visible evidence of asbestos contamination, whether the excavated material was raked, or whether the environmental consultant relied only on the visible appearance of soil samples;
- Borehole samples significantly under-estimated the extent of asbestos contamination at a Site; and
- No groundwater wells were installed and monitored.

The Site Auditor considered that the data provided by the Alliance 2019 DSI for the PBR site did not meet the data comparability DQO because:

- A grid-based asbestos survey was not performed when the concrete ground slab / pavements were removed from across the Site;
- Three of the boreholes/test pits at the Stage 2 area (BH03, TP02) were shallow and did not penetrate through the fill layer;
- No description was provided explaining how soils that were excavated for test pits were examined for visible evidence of asbestos contamination, whether the excavated material was raked, or whether the environmental consultant relied only on the visible appearance of soil samples;
- Borehole samples significantly under-estimated the extent of asbestos contamination at a Site;
- Some of the soil samples were not chilled during transportation to the lab as indicated on Eurofins lab certificates 638294-W, 638294-S, 639620-W;
- Some of the soil samples were not correctly preserved as indicated on Eurofins lab certificate 638476-S; and
- Three of the four groundwater wells[22] were short (<2.5 m) and may not have provided representative samples of the regional shallow groundwater quality.

[22] BH01/GW01 at 1.9 m, BH04/GW04 at 1.7 m and BH06/GW06 at 2.0 m

The Site Auditor assessed the significance of these deficiencies on the assessment of contamination risks in **Sections 2.7** – **2.13**.

2.6.7 Precision & Accuracy

A summary of the available information relevant to an assessment of the precision and accuracy of the data is provided in **Table 2-20**.

Table 2-20: Summary of Precision & Accuracy Compliance

Precision & Accuracy	SESL 2019 DSI 79 PBR (Ref [4])	Alliance 2019 DSI Stage 2 (Ref [5])
Use of properly trained and qualified field personnel	Sectn 2.5	Sectn 6.6
Blind field duplicates collected at a minimum rate of 1 in 10	Sectn 1.1, Appn C	Sectns 6.5.3, 9.4 & 9.5
RPD's less than 30% for inorganic and 50% for organic analyses	Sectn 1.1, Appn C	Sectns 6.6, 9.4 & 9.5
Acceptable levels for equipment rinsate blanks	**Not performed**	Sectns 6.5.1, 6.6 & 9.5
Acceptable levels for field & trip blanks	Sectn 1.2, Appn C	Sectns 6.5.2, 6.6 & 9.5
Acceptable levels for laboratory-prepared trip spike results for volatile analytes	Sectn 1.2, Appn C	Sectns 6.5.2, 6.6 & 9.5
Laboratory QC criteria achieved	Sectn 1.2, Appn C	Sectns 6.5.4, 6.6, 9.4 & 9.5

Note:

The EPA acceptance criteria for method blanks and spike recovery results are specified in Section 8 of AS4482.1-1997.

Legend:

Inadequate information provided in investigation reports

The Site Auditor considered the laboratory data provided by the ESAs generally met the precision and accuracy DQOs.

2.7 Aesthetic Issues

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

Depth and Extent of Fill

No detailed assessment of the depth and extent of fill across the PBR site was provided by the ESAs. The SESL 2019 DSI[23] only advised that the investigation identified significant quantities of fill at 79 PBR and that historic cut and fill were suspected of having been used to create the site levels that existed prior to the commencement of motorway construction work. The Site Auditor addressed this data gap by reviewing the available borehole and test pit log data and plotting fill depths at each investigation location in **Figures 2-12** and **2-13**.

[23] Sections 4.2 & 6.6, Ref [4]

Figure 2-12 Aesthetic Impacts & Fill Thickness (m) Identified by the SESL 2019 DSI at 79 PBR

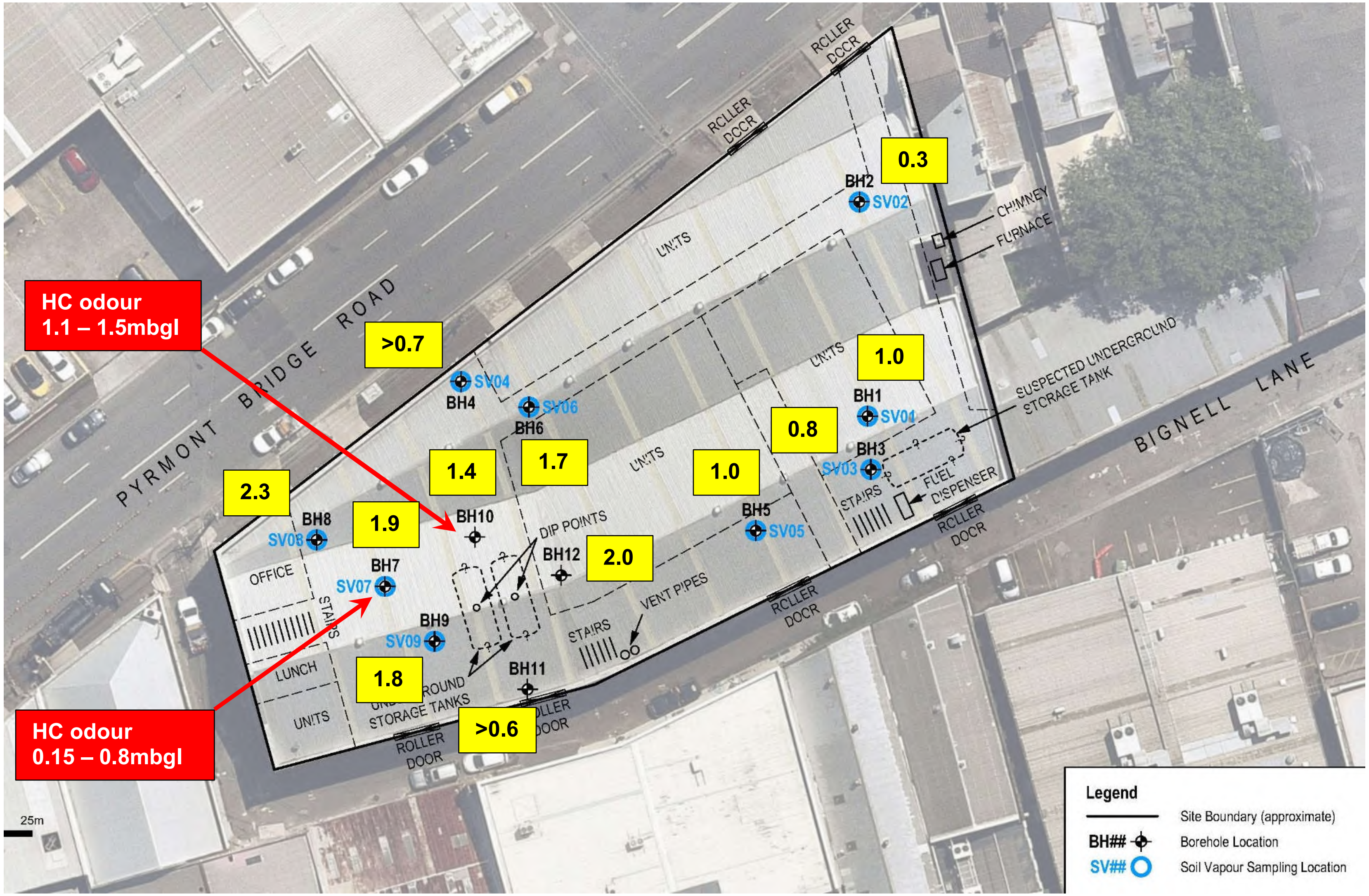


Figure 2-13 Aesthetic Impacts & Fill Thickness (m) Identified by the Alliance 2019 DSI at the PBR Site

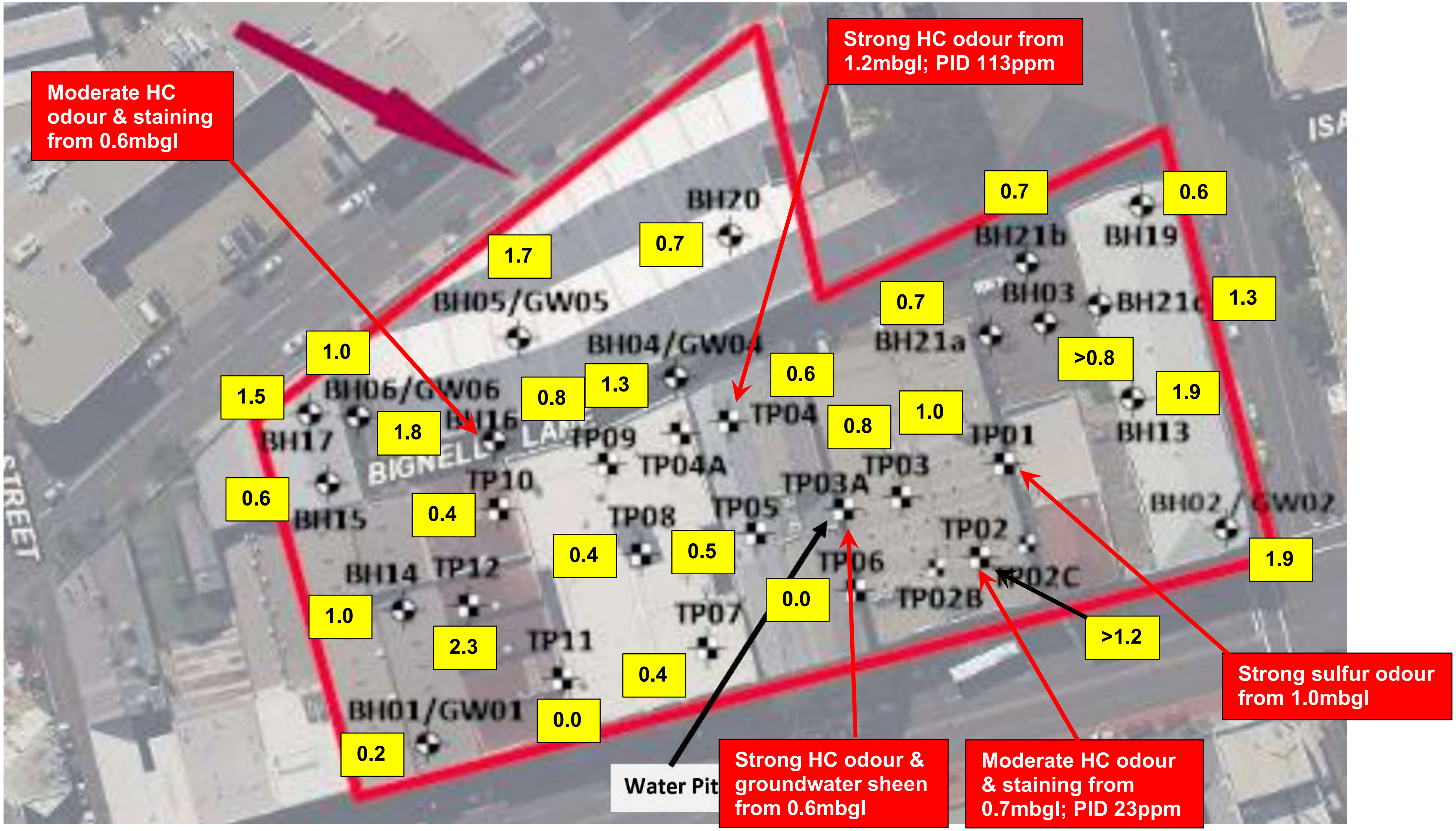


Figure 2-14 Extent of Aesthetic Impacts Estimated by Alliance 2019 DSI (Source: Figure 6, Ref [5])

The Site Auditor considered the investigation data showed that the measured fill layer thickness varied between 0 – 2.3 m across the Site with the thickness ranges for the three parts of the PBR site being:

- 0.3 – 2.3m at 79 PBR;
- 0 – 2.3m at the Stage 2 area; and
- 0.7 – 1.8m along Bignell Lane.

The fill thickness was probably deeper to 2.5 – 3.0 m at UST locations.

Aesthetic Conditions at 79 PBR

The SESL 2019 DSI[24] described soils at 79 PBR as:

- Fill contained high concentrations of variable anthropogenic material in soil types that ranged from clays, sands, gravels and mixtures;
- A large portion of fill contained foreign material including slag, ash, glass, tile, paper, brick, concrete and sandstone / rock fragments;
- No elevated PID readings were measured in the fill or natural soils, with all readings <2 ppm;
- Practically no odorous or stained soils were reported, the exceptions being a layer of black stained fill at BH7 (0.15 – 0.8 mbgl) and a slight hydrocarbon odour at BH10 (1.1 – 1.5 mbgl); and
- No elevated PID readings or odorous soils were reported close to or under the USTs.

The Alliance 2019 DSI[25] reported no aesthetic impacts at the two locations investigated at 79 PBR (BH05/GW05, BH20).

Aesthetic Conditions at Stage 2 Area and Bignell Lane

The Alliance 2019 DSI[26] described soils and groundwater at the Stage 2 area and along Bignell Lane as:

- Fill contained anthropogenic material that included asphalt and concrete gravels to boulders, brick, Styrofoam, ash and tile;
- No visible asbestos at the ground surface;
- Elevated PID readings were measured at some locations;
- Moderate hydrocarbon odours were found at TP02 (0.7-0.9mbgl) and TP10 (0.8 mbgl), with strong hydrocarbon odours at TP03A (0.6-0.8 mbgl) and TP04 (1.2-1.3 mbgl);
- Hydrocarbon stained soil was found at BH16 (0.6-0.8 mbgl), TP02 (0.7-0.9 mbgl) and a groundwater sheen at TP03A (0.6-0.8 mbgl);
- High levels of petroleum hydrocarbon and heavy metal contamination[27] were measured in a sample of seepage water taken from test pit TP03A, which was located near and down-gradient to the central UST; and
- Sulfur odours were found at TP01.

Alliance considered the aesthetic impacts at the Stage 2 area and Bignell Lane were due to the presence of hydrocarbon contamination in soils and groundwater and was not indicative of the presence of USTs /pits. There was also the potential for hazardous ground gases to be present. The extent of aesthetic impacts estimated by the Alliance 2019 DSI is shown in **Figure 2-14**.

24 Sections 10 & 11.2.1, Ref [4]
25 Sections 7.2, 7.3.1 – 7.3.3, 10.5, Ref [5]
26 Sections 7.2, 7.3.1 – 7.3.4, 10.5, Ref [5]
27 TRH C10-C14 2.5 mg/L, C15-C28 35 mg/K, C29-C36 2.6 mg/L, C10-C36 (total) 40.1 mg/L, lead 260 µg/L, zinc 360 µg/L

Site Auditor Review

The Site Auditor considered the weight of evidence supported the description of the known aesthetic condition of soil and groundwater at the PBR site as described by the ESAs and shown by the data plotted in **Figures 2-12** and **2-13**.

However, there was potential for additional unknown aesthetic impacts at the Site from:

- Visible asbestos at the groundsurface due to the absence of a grid-based surface of the Site following the completion of site clearing work;
- Known USTs following their excavation and removal;
- Unknown USTs / pits; and
- Buried services / underground structures.

These data gaps needed to be addressed from data provided by the site clearing and earthworks operation, which is considered in **Section 2.14**.

2.8 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 (ambient) contaminant levels for soils at the PBR site. The Site Auditor addressed this deficiency by adopting the conservative assumption that all contamination at the Site was from past activities at the Site and needed to be considered in the contamination risk assessment.

The natural soil samples that were laboratory tested by the Alliance 2019 DSI were used to derive background heavy metal concentrations, with a summary of the data provided in **Table 2-7**. These background levels were used to derive the EILs adopted in **Table 2-9**.

2.9 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*'.

2.9.1 79 PBR

The CSM identified the soils at risk of contamination at 79 PBR to be:

- Fill across the site (APEC 1, 3 and 10);
- Natural soil across the site (APEC 3, 5-8, 10);
- Shallow and deeper soils (both fill and natural soil) in the vicinity of USTs (APEC 2);
- Fill at the furnace and chimney area (APEC 9); and
- Fill around buried services (APEC 11).

Fill (APEC 1, 3 and 10)

The SESL 2019 DSI[28] concluded that:

- Significantly contaminated fill material was present at 79 PBR; and
- More extensive asbestos contamination was likely to be present due to the extensive amount of demolition rubble in the fill and the reliance on borehole rather than test pit data.

[28] Section 14.1, Ref [4]

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

- The ESA data generally met the DQOs, for the reasons given in **Section 2.6**
- The borehole and test pit logs identified the presence of ash, slag, mild hydrocarbon odours at BH7 (0.15–0.8 mbgl) and BH10 (1.1–1.5 mbgl)
- The borehole and test pit logs identified the presence of demolition rubble in the fill, which is an indicator of possible asbestos contamination
- Heavy metal hotspots (2.5 times SIL) were measured at 7 of the 14 sample locations at 79 PBR:
  - Arsenic EIL hotspot at BH7;
  - Cadmium EIL hotspot at BH3;
  - Copper EIL hotspots at BH3, BH5, BH7, BH8 and BH12;
  - Lead HIL hotspots at BH3, BH7, BH8;
  - Zinc EIL hotspots at BH1 – BH3, BH5 – BH7, BH12.
- The heavy metal hotspots were spread across the 79 PBR site
- A statistical analysis of the heavy metal fill data (**Table 2-21**) calculated 95% upper confidence limit (**UCL**) average concentrations that exceeded the SILs for:
  - Arsenic 272 mg/kg (EIL 160 mg/kg);
  - Copper 1,740 mg/kg (EIL 330 mg/kg);
  - Lead 2,866 mg/kg (HIL 1,500 mg/kg); and
  - Zinc 12,556 mg/kg (EIL 523 mg/kg).
- The 95% UCL average concentration for BaP exceeded the EIL (1.4 mg/kg), with exceedances of the EIL occurred at most sample locations
- BaP (TEQ) exceeded the HIL (40 mg/kg) at BH5 (53.9 mg/kg) and BH7 (265 mg/kg)
- Friable asbestos was detected in BH8 (0-0.1m)
- More extensive asbestos contamination was likely to be present due to the extensive amount of demolition rubble in the fill, reliance on borehole rather than test pit data and the absence of a grid-based detailed survey of visible asbestos
- TRH F2 (>C10-C16) exceeded the EIL (170 mg/kg) at BH7 (770 mg/kg), TRH F3 (>C16-C34) exceeded the EIL (2,500 mg/kg) at BH7 (14,600 mg/kg) and BH11 (5,550 mg/kg).

The data showed that the main contaminants of concern in fill at the Site were heavy metals, TRH and PAHs. The data also showed that BTEX, phenols, OCPs, PCBs, VOCs / VHCs were not contaminants of concern in fill at 79 PBR because:

- All fill samples tested measured low to non-detectible concentrations below the SILs; and
- Groundwater samples collected at the PBR site measured low to non-detectible concentrations below the SILs.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

Table 2-21 Statistical Analysis of Heavy Metal Contamination in Fill at 79 PBR

		ANALYTE CONCENTRATIONS (mg/kg)							
Sample	**Soil Type**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**
SESL 2019 DSI									
BH1	Fill	23.0	2.0	23.0	313	1030	0.2	14	1900
BH2	Fill	6.0	2.0	13.0	55	205	1.4	5	1390
BH3	Fill	85.0	36.0	16.0	1530	7290	0.8	72	57600
BH4	Fill	9.0	<1	18.0	362	372	0.2	6	522
BH5	Fill	46.0	3.0	27.0	3120	2110	0.2	39	1610
BH6	Fill	10.0	1.0	13.0	116	846	0.7	12	1480
BH7	Fill	1250.0	2.0	33.0	2230	3800	9.1	40	1470
BH8	Fill	131.0	2.0	31.0	2250	4860	3.3	30	647
BH9	Fill	12.0	1.0	15.0	137	540	0.5	9	869
BH10	Fill	10.0	<1	15.0	468	2730	7.8	10	587
BH11	Fill	18.0	<1	29.0	389	704	0.4	17	833
BH12	Fill	24.0	11.0	43.0	4150	942	2.1	351	6040
Alliance 2019 DSI									
BH05	Fill	7.5	<0.4	14	200	380	0.4	6.7	340
BH20	Fill	4	<0.4	12	280	270	0.4	5.5	520
Number of samples		14	14	14	14	14	14	14	14
t		1.771	1.771	1.771	1.771	1.771	1.771	1.771	1.771
Mean		116.8	4.4	21.6	1114	1863	1.96	44.1	5415
Standard Deviation		328	9.5	9.6	1322	2119	2.89	90.4	15087
COV		2.81	2.15	0.444	1.19	1.14	1.47	2.05	2.79
95% UCL		**272**	**8.9**	**26**	**1740**	**2866**	**3.3**	**87**	**12556**
HIL D		**3000**	**900.0**	**3600 (VI)**	**240000**	**1500**	**730.0**	**6000**	**400000**
EIL D		160	10.0	685	330	1800	6.6	604	523

Notes:
(1) Reference: NSW EPA (September 1995) "Contaminated Sites Sampling Design Guidelines"
(2) Half detection limit used for non-detectible results

Natural Soil (APEC 3, 5-8, 10)

The SESL 2019 DSI[29] concluded that natural soil underlying fill material at 79 PBR was not contaminated. The Site Auditor considered the weight of evidence supported this conclusion because:

- The ESA data generally met the DQOs, for the reasons given in **Section 2.6;**
- The borehole and test pit logs did not record any physical evidence of contamination in natural soils at 79 PBR; and
- All natural soil samples measured concentrations for the potential contaminants of concern less than the SILs.

Soils Near USTs (APEC 2)

The SESL 2019 DSI[30] concluded that:

- Soils in the vicinity of USTs had been impacted by leaks / spills of diesel or heavy fuel oil that had the potential to migrate to surrounding soils;

[29] Section 14.1, Ref [4]
[30] Section 14.1, Ref [4]

- The main exceedances were for TRH C16-C34 and TRH C34-C40;
- The extent of this contamination had not been defined but may have impacted both shallow and deep soils / bedrock in the southern half of 79 PBR at concentrations that exceeded HIL D criteria; and
- There was a risk of more USTs being present at the site since no SafeWork NSW search had been conducted.

The Site Auditor considered the weight of evidence supported these conclusions together with the conclusion that there was a risk of petroleum hydrocarbon contamination at USTs exceeding the commercial/industrial SILs. This is because:

- The borehole and test pit logs identified the presence of mild hydrocarbon odours at BH7 (0.15 – 0.8mbgl) and BH10 (1.1–1.5 mbgl)
- TRH F2 (>C10-C16) exceeded the EIL (170 mg/kg) at BH7 (770 mg/kg), TRH F3 (>C16-C34) exceeded the EIL (2,500 mg/kg) at BH7 (14,600 mg/kg) and BH11 (5,550 mg/kg)
- There was the potential for more extensive petroleum hydrocarbon contamination at 79 PBR because:
  - Insufficient deep soil samples were collected from near the base of the two known USTs (2 samples tested compared to a minimum requirement of 4); and
  - There was a risk of a third UST in the SE corner of the site and insufficient shallow soil samples and no deep soil samples were collected from this area.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

Fill at Furnace and Chimney (APEC 9)

The SESL 2019 DSI[31] advised there was a risk of contaminated fill at the furnace and chimney because this risk had not been investigated and recommended that an investigation be undertaken following removal of these structures.

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

- Operations at a furnace and chimney had the potential to generate contaminated waste in the form of ash, charcoal, slag and other chemical by-products;
- No test pits or boreholes were located at or near this area; and
- The ESA data showed that fill at 79 PBR was contaminated by heavy metals, TRH and PAHs.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

Buried Services and Surrounding Fill (APEC 11)

The SESL 2019 DSI[32] advised that there was a risk of contamination around buried services and recommended this risk be managed during construction work under a construction environmental management plan (**CEMP**).

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

- Buried services had the potential to contain asbestos and contain wastes contaminated by heavy metals and PAHs;
- The historic location of old buried services at 79 PBR was not investigated;
- No test pits or boreholes investigated near buried services; and
- The ESA data showed that fill at 79 PBR was contaminated by heavy metals, TRH and PAHs.

[31] Section 14.2, Ref [4]
[32] Section 14.2, Ref [4]

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

2.9.2 Stage 2 Area and Bignell Lane

The CSM identified the soils at risk of contamination at the Stage 2 area and Bignell Lane to be:

- Fill across the site (APEC 1, 3 and 10);
- Natural soil across the site (APEC 3, 5-8, 10);
- Shallow and deeper soils (both fill and natural soil) in the vicinity of USTs (APEC 2); and
- Fill around buried services (APEC 11).

Fill (APEC 1, 3 and 10)

The Alliance 2019 DSI[33] described the results obtained by the investigation but provided no conclusion regarding the risk of contamination exceeding the SILs and the suitability of the Stage 2 and Bignell Lane areas as a road construction worksite. The Site Auditor addressed this data gap by reviewing the available data.

The Site Auditor considered the weight of evidence supported the conclusion that the was a low risk of significant contamination exceeding the commercial/industrial D SILs at the Stage 2 and Bignell Lane areas. This is because:

- The ESA data generally met the DQOs, for the reasons given in **Section 2.6**
- The borehole and test pit logs identified:
  - Fill containing anthropogenic material that included asphalt and concrete gravels to boulders, brick, Styrofoam, ash and tile;
  - Elevated PID readings were measured at some locations;
  - Moderate hydrocarbon odours were found at TP02 (0.7-0.9mbgl) and TP10 (0.8 mbgl), with strong hydrocarbon odours at TP03A (0.6-0.8 mbgl) and TP04 (1.2-1.3 mbgl);
  - Hydrocarbon stained soil was found at BH16 (0.6-0.8 mbgl), TP02 (0.7-0.9 mbgl) and a groundwater sheen at TP03A (0.6-0.8 mbgl); and
  - Sulfur odours were found at TP01.
- No hotspots were found along the Bignell Lane area and only zinc EIL hotspots (2.5 times SIL) were found in fill at the Stage 2 area at TP03A and TP04 in the central part
- A statistical analysis of the heavy metal fill data (**Table 2-22**) calculated UCL average concentrations below all SILs
- A few samples measured TRH F2 (>C10-C16) and BaP concentrations exceeding the EILs
- No visible asbestos was identified in materials excavated from test pit or in borehole samples, with all lab samples measuring non-detectible concentrations
- The data showed that BTEX, phenols, OCPs, PCBs, VOCs / VHCs were not contaminants of concern in fill at the Stage 2 and Bignell Lane areas, with all samples measuring low to non-detectible concentrations below the SILs
- Groundwater samples collected at the PBR site measured low to non-detectible concentrations below the SILs except for some heavy metals.

[33] Section 11, Ref [5]

Table 2-22 Statistical Analysis of Heavy Metal Contamination in Fill at Stage 2 and Bignell Lane Areas

		ANALYTE CONCENTRATIONS (mg/kg)							
Sample	**Soil Type**	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Alliance 2019 DSI									
TP01	Fill	54.0	0.7	29.0	100	340	0.3	19	320
TP02	Fill	17.0	8.2	730.0	190	2200	0.2	200	810
TP02B	Fill	11.0	<0.4	35.0	12	39	<0.1	17	42
TP02C	Fill	9.4	1.1	25.0	780	190	<0.1	7.4	810
TP03	Fill	8.7	<0.4	23.0	39	230	0.7	16	130
TP03A	Fill	12.0	0.5	22.0	600	1800	0.2	9.7	1400
TP04	Fill	52.0	1.9	12.0	750	2600	0.2	44	1600
TP04A	Fill	43.0	0.4	28.0	60	680	1.1	9.9	510
TP05	Fill	6.9	<0.4	20.0	17	120	0.2	<5	110
TP07	Fill	7.4	<0.4	25.0	45	87	0.3	<5	100
TP08	Fill	6.2	<0.4	13.0	72	1100	0.6	8.9	250
TP09	Fill	3.3	<0.4	12.0	15	20	<0.1	7.3	25
TP10	Fill	3.8	<0.4	34.0	49	80	<0.1	16	640
TP12	Fill	7.7	<0.4	14.0	8.6	57	0.1	<5	48
BH01	Fill	19.0	<0.4	40.0	<5	36	<0.1	<5	<5
BH02	Fill	9.4	0.4	32.0	96	240	2.0	18	440
BH03	Fill	6.3	1.1	19.0	51	2800	0.9	20	810
BH04	Fill	5.8	0.4	16.0	230	710	0.4	28	590
BH06	Fill	5.1	<0.4	9.0	5.9	33	<0.1	<5	9.8
BH13	Fill	9.2	<0.4	27.0	38	160	0.8	12	120
BH14	Fill	3.1	<0.4	17.0	22	410	0.3	7.4	150
BH15	Fill	<2	<0.4	<5	<5	6.1	<0.1	<5	<5
BH16	Fill	9.2	<0.4	32.0	51	210	0.6	5.4	97
BH17	Fill	7.3	1.3	27.0	17	95	0.3	6.5	48
BH19	Fill	20.0	<0.4	88.0	7.8	58	0.1	<5	15
BH21A	Fill					820			
BH21B	Fill					900			
BH21C	Fill					2400			
Number of samples		25	25	25	25	28	25	25	25
t		1.711	1.711	1.711	1.711	1.711	1.711	1.711	1.711
Mean		13.5	0.8	53.3	130	658	0.39	18.8	363
Standard Deviation		14	1.6	142	227	872	0.45	39.0	441
COV		1.07	2.12	2.66	1.74	1.33	1.17	2.07	1.21
95% UCL		18	1.3	102	208	940	0.54	32.1	514
HIL D		**3000**	**900.0**	**3600 (VI)**	**240000**	**1500**	**730.0**	**6000**	**400000**
EIL D		160	10.0	685	330	1800	6.6	604	523

Notes:
(1) Reference: NSW EPA (September 1995) "Contaminated Sites Sampling Design Guidelines"
(2) Half detection limit used for non-detectible results

However, the Site Auditor considered it was likely that unknown contamination not identified by the ESAs was present at the Stage 2 and Bignell Lane areas because:

- More extensive asbestos contamination was likely to be present due to the extensive amount of demolition rubble in the fill, the absence of a grid-based detailed survey of visible asbestos; and no asbestos identification protocol was provided for soils excavated by test pits; and

- Insufficient fill samples were collected and tested for OCPs (13), PCBs (5), asbestos (3) and VOCs / VHCs (5) compared to a minimum requirement of 20.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

Natural Soil (APEC 3, 5-8, 10)

The Site Auditor considered the weight of evidence supported the conclusion that natural soil underlying fill material at the Stage 2 and Bignell Lane areas was not contaminated. This is because:

- The ESA data generally met the DQOs, for the reasons given in **Section 2.6;**
- The borehole and test pit logs did not record any physical evidence of contamination in natural soils at the Stage 2 and Bignell Lane areas; and
- All natural soil samples measured concentrations for the potential contaminants of concern less than the SILs.

Soils Near USTs (APEC 2)

The Site Auditor considered there was potential for petroleum hydrocarbon contamination to be present at the central and eastern USTs at the Stage 2 area exceeding the commercial/industrial SILs together with a risk of unknown USTs being present. This is because:

- The borehole and test pit logs identified:
  - Elevated PID readings were measured at some locations;
  - Moderate hydrocarbon odours at TP02 (0.7-0.9mbgl) and TP10 (0.8 mbgl), with strong hydrocarbon odours at TP03A (0.6-0.8 mbgl) and TP04 (1.2-1.3 mbgl); and
  - Hydrocarbon stained soil at BH16 (0.6-0.8 mbgl), TP02 (0.7-0.9 mbgl) and a groundwater sheen at TP03A (0.6-0.8 mbgl).
- High levels of petroleum hydrocarbon and heavy metal contamination[34] were measured in a sample of seepage water taken from test pit TP03A, which was located near and down-gradient to the central UST
- There was the potential for more extensive petroleum hydrocarbon contamination at the two known USTs at the Stage 2 area because:
  - Central UST (APEC 2): No deep soil samples were collected from near the UST base; and
  - Eastern UST (APEC 2): No shallow or deep soil samples were collected near the UST.
- There was a risk of more USTs being present at the Stage 2 area since no SafeWork NSW search had been conducted.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

Buried Services and Surrounding Fill (APEC 11)

The Site Auditor considered there was a risk of contamination around buried services at the Stage 2 and Bignell Lane areas because:

- Buried services had the potential to contain asbestos and contain wastes contaminated by heavy metals and PAHs;
- The historic location of old buried services at the Stage 2 and Bignell Lane areas was not investigated; and

[34] TRH C10-C14 2.5 mg/L, C15-C28 35 mg/K, C29-C36 2.6 mg/L, C10-C36 (total) 40.1 mg/L, lead 260 µg/L, zinc 360 µg/L

- No test pits or boreholes investigated near buried services.

The Site Auditor considered this contamination risk when reviewing the site management strategy in **Section 2.14**.

2.10 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 risks posed by chemical mixtures. 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 PBR site comprised benzene, PCBs, OCPs, PAHs (principally BaP) and chlorinated solvents.

The Site Auditor assessed the available data and considered there was a low risk of additional health risks posed by chemical mixtures because all samples measured low (below HIL D criteria) to non-detectible concentrations for most of these contaminants, the one exception being BaP.

2.11 Surface Water & 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'.*

2.11.1 Surface Water

Contamination risks to surface water was not an issue for the PBR site since no surface water bodies were located at or near the Site.

2.11.2 Groundwater

Groundwater Levels & Flow Direction

The Alliance 2019 DSI[35] gauged groundwater levels at four locations across the PBR site, with a summary of the data provided in **Table 2-23** and a plot of measured groundwater levels provided in **Figure 2-15**.

Alliance considered that the groundwater flow direction was to the west. The Site Auditor considered the regional groundwater table in the fractured sandstone bedrock was likely to flow to the west, since the closest receiving water body for stormwater discharges from the Site and groundwater underlying the Site was Johnson Creek 200 m to the NW, which discharged into Rozelle Bay that formed part of the Parramatta River (**Figure 2-8**).

However, the groundwater levels measured by the Alliance 2019 DSI suggested that the monitored shallow groundwater was likely to have been perched in the soils overlying the fractured bedrock. The neutral pH and low electrical conductivity (EC) values that were measured by the Alliance 2019 DSI also supported the monitored groundwater being perched and sourced from rainwater infiltration.

[35] Section 7.7, Ref [5]

Table 2-23 Groundwater Well Gauging Data (Source: Tables 7.6.1 & 7.6.2, Ref [5])

Sampling Point	Gauged Depth to Groundwater (m BTOC)	Total Well Depth (m BTOC)
GW01	1.780	1.785
GW02	3.02	4.13
GW04	0.44	1.70
GW06	1.47	1.99

Sampling Point	Dissolved Oxygen (ppm)	Electrical Conductivity (ms/cm)	pH	Redox (mV)	Temperature (°C)
GW01	No groundwater extracted from GW01				
GW02	0.27	591	6.47	40.5	22.5
GW04	0.29	622	7.45	133.8	23.9
GW06	1.69	392	6.10	92.4	22.5

- No light non-aqueous phase liquid (**LNAPL**) in baled samples

The data plotted in **Figure 2-15** indicated that the flow direction for perched groundwater at the PBR site was likely to be highly variable and possibly to the south-east. This outcome indicated that additional groundwater investigations would need to be undertaken if monitoring conducted by the Alliance 2019 DSI found significant groundwater contamination at the PBR site.

Groundwater Contamination

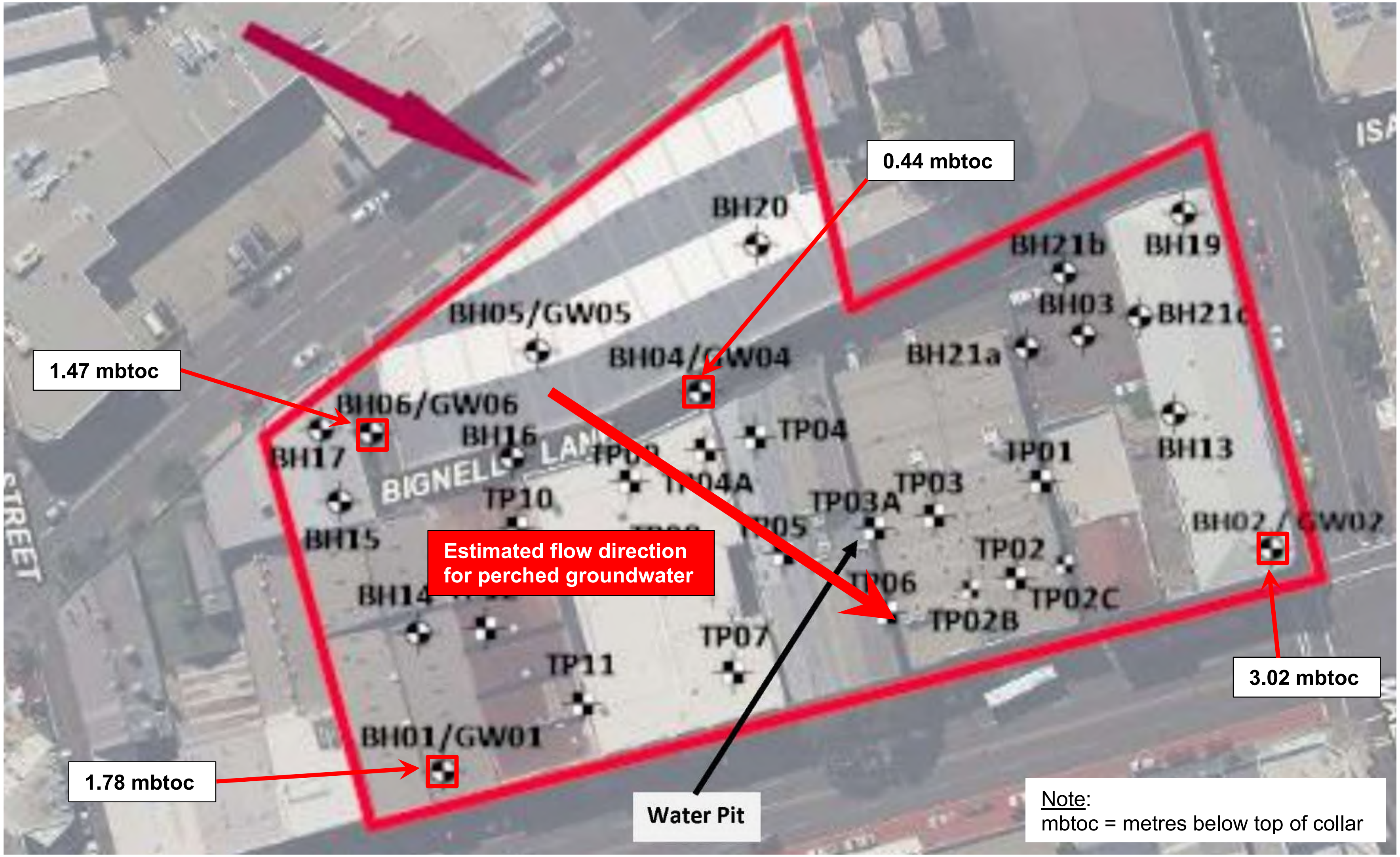
The Alliance 2019 DSI did not assess the nature and extent of groundwater contamination at the PBR site. The Site Auditor addressed this data gap by reviewing the available data. The available data consisted of one sampling round conducted on 14/03/19 at wells BH02/GW02, BH04/GW04 and BH06/GW06 that were tested for heavy metals, TRH, BTEX, PAHs, phenols, and VOCs / VHCs.

The Site Auditor considered the quality of the groundwater data provided by the Alliance 2019 DSI did not meet the DQOs because:

- Records of groundwater well development, purging and sampling were not provided;
- Some of the soil samples were not chilled during transportation to the lab as indicated on Eurofins lab certificates 638294-W, 638294-S, 639620-W; and
- Three of the four groundwater wells[36] were short (<2.5 m) and may not have provided representative samples of the regional shallow groundwater quality.

[36] BH01/GW01 at 1.9 m, BH04/GW04 at 1.7 m and BH06/GW06 at 2.0 m

Figure 2-15 Plot of Groundwater Levels Measured at the PBR site by the Alliance 2019 DSI



The Site Auditor considered these potential deficiencies in the groundwater investigation when reviewing the water quality data.

The groundwater contamination levels measured by the Alliance 2019 DSI for the contaminants of concern were:

- **Heavy metals**: All heavy metals were measured at concentrations below the recreational and irrigation GILs. For the marine water GILs, arsenic, mercury, nickel and zinc were measured at low concentrations below or near the GILs. The other metals were measured at:
  - Cadmium: <0.2 to 50 µg/L (Marine GIL 0.7 µg/L);
  - Chromium (III): 1 to 96 µg/L (Marine GIL 27 µg/L);
  - Copper: <1 to 34 µg/L (Marine GIL 1.3 µg/L); and
  - Lead: <1 to 50 µg/L (Marine GIL 4.4 µg/L).
- **TRH**: All samples measured non-detectible TRH concentrations with the detection limits being C6-C9 20 µg/L, C10-C14 50 µg/L, C15-C28 100 µg/L, C29-C36 100 µg/L.
- **BTEX, VOCs, VHCs, phenols and PAHs**: All samples measured low concentrations below the GILs, with practically all samples measuring non-detectible concentrations.

Nature and Extent of Heavy Metal Contamination

The Site Auditor considered that the main source of heavy metal contamination in shallow groundwater at the Site was the anthropogenic waste in the fill mainly at the land at 79 PBR and to a lesser extent the land at the Stage 2 and Bignell Lane areas. This is because:

- The historical data indicated that 79 PBR had a long history of light industrial use that included coach building, vehicle workshop / servicing / panel beating, vehicle sales. Hastings Deering (a heavy vehicle manufacturer and distributor) owned the property at 79 PBR for over 30 years;
- The ESAs found the fill at 79 PBR to be contaminated by heavy metals exceeding the commercial/ industrial SILs, particularly copper, lead, zinc and to a lesser extent arsenic and cadmium; and
- The highest heavy metal concentrations were measured in wells BH04/GW04 and BH06/GW06 located in Bignell Lane adjacent to 79 PBR, while the lowest levels were measured at well BH02/GW02 in the SE corner of the Stage 2 area.

Nature and Extent of Petroleum Hydrocarbon Contamination

The Site Auditor considered that petroleum hydrocarbon contamination in shallow groundwater at the PBR site was likely to be localised to former UST areas and not contain elevated volatile hydrocarbon contamination. This is because:

- The ESAs found only localised petroleum hydrocarbon contamination in fill soils and no evidence of contamination in the underlying natural soils;
- The extent of hydrocarbon odours / staining in soils were localised;
- PID headspace readings from soil samples collected in the field were all low and less than 2 ppm;
- No soil samples measured volatile hydrocarbons at concentrations exceeding the HIL D criteria;
- All groundwater samples measured low concentrations of volatile hydrocarbons below the GILs, with practically all samples measuring non-detectible concentrations.

Contamination Risks Posed by Off-site Sources

The Site Auditor considered the weight of evidence supported the conclusion that off-site contaminant sources posed a low contamination risk to the use of the Site as a road construction worksite for the reasons given in the previous section.

Risks Posed by Groundwater Contamination to Road Construction Worksite

The Site Auditor considered the weight of evidence supported the conclusion that there was likely to be a low risk of groundwater contamination affecting the suitability of the PBR site as a road construction worksite. This is because:

- The nature and extent of groundwater contamination measured at the Site, as described in previous sections;
- The construction project involved the excavation and removal of much of the fill layer from the Site, which would reduce the potential for heavy metal contamination to leach into groundwater;
- The project involved the demolition of all structures at the Site and the removal of all USTs, which represented the main source of petroleum hydrocarbon contamination at the Site; and
- The Site was used as a tunnelling site and provided subsurface access via a temporary access to the mainline tunnels. This involved the construction of deep access tunnels that resulted in the continuous removal of shallow groundwater from the Site and its processing in the project's wastewater treatment plant.

The Site Auditor considered the deficiencies in the groundwater data quality could be addressed by the Site Auditor reviewing environmental data collected during construction work at the Site. The Site Auditor considered this requirement when reviewing the site management strategy in **Section 2.14**.

2.12 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*'.

The ground gas data collected by the ESAs at the PBR site comprised:

- SESL 2019 DSI at 79 PBR:
  - PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern;
  - Laboratory tests on soil samples for volatile hydrocarbons (TRH, BTEX, naphthalene, VHCs); and
  - Installed nine sub-slab vapour pins (SV01 – SV09) in the concrete slab that covered the area prior to its removal and the monitoring of soil vapour.
- The Alliance 2019 DSI at whole of the PBR site:
  - PID headspace tests at 0.5 – 1.0 m intervals and the collection and laboratory testing of soil samples for contaminants of concern; and
  - Laboratory tests on soil and groundwater samples for volatile hydrocarbons (TRH, BTEX, naphthalene, VHCs).

The ESAs provided no assessment of contamination risks posed by soil vapours at the PBR site. The Site Auditor addressed this data gap by reviewing the available data.

The Site Auditor considered the weight of evidence supported the conclusion there was likely to be a low risk of ground gases being present at the PBR site that posed an unacceptable risk for a road construction worksite both during and at the end of construction and prior to landscaping by TfNSW. This is because:

- The historical and site condition data (**Sections 2.2** and **2.3**) indicated that:
  - The main source of soil vapour at the Site was likely to be leakage / spillage from old USTs; and

- Potential off-site sources of volatile hydrocarbons were located at least 50 m from the Site, as shown by **Figure 2-8**.

➢ The aesthetic data at 79 PBR (**Section 2.7**) showed:

- No elevated PID readings were measured in the fill or natural soils, with all readings <2 ppm;
- Practically no odorous or stained soils were reported, the exceptions being a layer of black stained fill at BH7 (0.15 – 0.8 mbgl) and a slight hydrocarbon odour at BH10 (1.1 – 1.5 mbgl); and
- No elevated PID readings or odorous soils were reported close to or under the USTs.

➢ The aesthetic data at the Stage 2 and Bignell Lane areas (**Section 2.7**) showed:

- Elevated PID readings were measured at only a few some locations;
- Petroleum hydrocarbon impacts were likely to be localised because moderate to strong hydrocarbon odours were found at only a few locations at shallow depths[37], hydrocarbon stained soil was found only a few locations at shallow depths[38], a groundwater sheen was only found at TP03A (0.6-0.8 mbgl), and high levels of petroleum hydrocarbon contamination[39] were measured in a single sample of seepage water taken from test pit TP03A located near and down-gradient to the central UST;

➢ The soil contamination data at 79 PBR (**Section 2.9.1**) showed only a few localised exceedances of EILs, with no exceedances of the soil vapour HILs;

➢ The soil contamination data at the Stage 2 and Bignell Lane areas (**Section 2.9.2**) showed only a few localised exceedances of EILs, with no exceedances of the soil vapour HILs;

➢ The groundwater data (**Section 2.11.2**) showed:

- Only localised petroleum hydrocarbon contamination in fill soils and no evidence of contamination in the underlying natural soils; and
- Practically all groundwater samples measured non-detectible volatile hydrocarbon concentrations, with the only detection being for toluene at 1 µg/L at BH04/GW04.

➢ The 9 vapour pins monitoring conducted by the SESL 2019 DSI met or was close to meeting the DQOs, with a plot of the pin locations shown in **Figure 2-16**.

➢ Practically all monitoring conducted at the 9 vapour pins installed in ground slabs at 79 PBR measured non detectible volatile hydrocarbon concentrations. The only detections made by the SESL 2019 DSI were at SV05 which measured low concentrations well below the commercial/industrial criteria:

- Benzene 0.11 µg/m^3 (criteria 4 mg/m^3), which was just above the PQL of 100 µg/m^3; and
- Toluene 0.19 µg/m^3 (criteria 4,800 mg/m^3), which was at the PQL of 190 µg/m^3.

The Site Auditor considered the deficiencies in the soil vapour data quality could be addressed by the Site Auditor reviewing environmental data collected during construction work at the Site. The Site Auditor considered this requirement when reviewing the site management strategy in **Section 2.14**.

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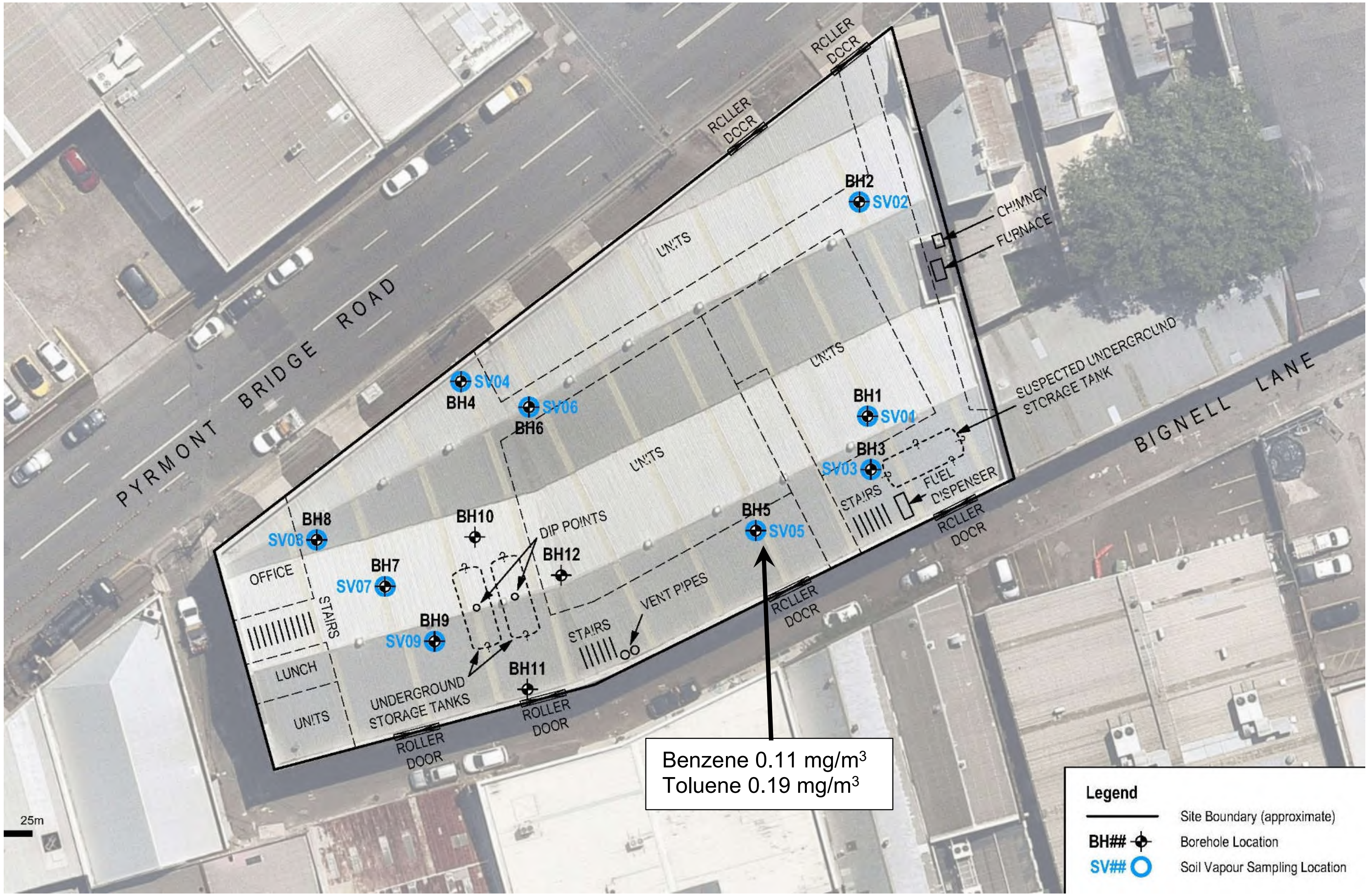
37 Moderate hydrocarbon odours at TP02 (0.7-0.9mbgl) and TP10 (0.8 mbgl), with strong hydrocarbon odours at TP03A (0.6-0.8 mbgl) and TP04 (1.2-1.3 mbgl)

38 At BH16 (0.6-0.8 mbgl) and TP02 (0.7-0.9 mbgl)

39 TRH C10-C14 2.5 mg/L, C15-C28 35 mg/K, C29-C36 2.6 mg/L, C10-C36 (total) 40.1 mg/L, lead 260 µg/L, zinc 360 µg/L

Figure 2-16 Soil Vapour Pin Monitoring Locations Used by SESL 2019 DSI at 79 PBR Area (Source: Figure 4, Ref [4])



2.13 Ecological Risks

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

The data provided by the ESAs showed:

- The majority of fill material at 79 PBR exceeded the EILs for commercial / industrial D land use due to the presence of high heavy metal concentrations, primarily copper, lead and zinc (**Section 2.9**);
- The Site Auditor considered exceedances of the NEPM (2013) EIL for BaP of 1.4 mg/kg was not significant, since all samples measured concentrations below the CRC CARE 2017 study[40], which justified a commercial/industrial EIL for BaP of 72 mg/kg;
- Much lower heavy metal concentrations in fill at the Stage 2 and Bignell Lane areas, with all analytes having UCL average concentrations below the EILs;
- All heavy metals in groundwater were measured at concentrations below the recreational and irrigation GILs (**Section 2.11.2**). For the marine water GILs, arsenic, mercury, nickel and zinc were measured at low concentrations below or near the GILs. The other metals were measured at:
  - Cadmium: <0.2 to 50 µg/L (Marine GIL 0.7 µg/L);
  - Chromium (III): 1 to 96 µg/L (Marine GIL 27 µg/L);
  - Copper: <1 to 34 µg/L (Marine GIL 1.3 µg/L); and
  - Lead: <1 to 50 µg/L (Marine GIL 4.4 µg/L).

The Site Auditor these ecological risks when reviewing the site management strategy in **Section 2.14**.

2.14 Site Management Strategy

The tenth check in the EPA decision process was that '*the site management strategy (where relevant) is appropriate including post-remediation environmental plans.'*

2.14.1 Proposed Management Strategy

The Alliance 2019 DSI[41] recommended that contamination risks at the PBR site needed to be managed during the WestConnex Stage 3A Project by ASBJV undertaking the following tasks:

1. A supplementary contamination assessment needed to be carried out to further characterise and delineate the contamination identified by the SESL 2019 DSI including additional vapour delineation (including off-site locations) in conjunction with groundwater assessment to better characterise the observed vapour contaminants. Vapour will need to be managed during the construction project on-site and may require offsite mitigation;
2. Removal / validation of the identified USTs needed to be carried out as per the Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008);
3. Further assessment of odours, staining and sheen was required to address the potentially unacceptable aesthetics risk identified at the PBR site;
4. Further assessment of groundwater needed to be carried out during and following bulk earthworks and following the removal / validation of the USTs (where applicable) to determine whether the identified groundwater contamination was a result of historical on-site or adjacent land use;

[40] CRC CARE (January 2017) "*Technical Report no. 39, Risk-based management and remediation guidance for benzo(a)pyrene*"
[41] Section 11, Ref [5]

5. Groundwater sampling needed to be carried out during and following bulk earthworks and following the removal / validation of the USTs (where applicable) to determine whether the identified groundwater contamination was a result of historical on-site or adjacent land use;
6. Groundwater assessed at the PBR site was unsuitable for discharge to municipal stormwater without further assessment / treatment due to the detected concentrations of the contaminants of concern tested. If groundwater was expected to be encountered during the proposed development, a groundwater management plan was required; and
7. Any soil materials or liquid proposed for off-site disposal should be classified and disposed of as per the NSW EPA Waste Classification Guidelines (2014).

2.14.2 Site Auditor Review

The Site Auditor considered that groundwater and soil vapour risks at the PBR site were low and had been sufficiently investigated by the ESAs conducted in 2019 for the reasons given in **Sections 2.11** and **2.12**. The Site Auditor also considered that environmental data to be collected by the ASBJV environment team during construction work would provide additional data supporting this conclusion. Consequently, Alliance Tasks 1, 4 and 5 were not required.

The Site Auditor considered the site management strategy proposed by the Alliance 2019 DSI involving Tasks 2, 3, 6 and 7 was capable of leaving the PBR site at the end of ASBJV work in a condition suitable for a road construction worksite. This is because:

- The Site was investigated by the ESAs generally in compliance with EPA guidelines. Where deficiencies / data gaps existed they were not considered to be significant for the purpose of this site audit or the ability for ASBJV to manage contamination risks at the Site;
- The Site Auditor considered that the PBR site, prior to the commencement of construction work associated with the WestConnex Stage 3a project, was suitable for the ongoing commercial / industrial land use and thereby was suitable as a road construction worksite for the reasons given in **Sections 2.7** to **2.12**;
- There was a low risk of groundwater quality and soil vapours at the PBR site impacting the suitability of the Site as a road construction worksite either during or after the WestConnex Stage 3A project; and
- There was a low risk of contaminated groundwater or soil vapours migrating from the PBR site due to the low levels of contamination present.

The Site Auditor also considered that the ASBJV environment team needed to address additional issues at the PBR site during construction, these being:

8. Allow the Site Auditor to inspect the PBR site during work activities at the Site and then soon after completion of ASBJV activities at the time when the final condition of the Site was achieved.
9. Provide the Site Auditor with a copy of the Site Establishment Management Plan (**SEMP**) and Environmental Management Plan (**EMP**) that dealt with contamination at the Site.
10. Provide the Site Auditor with a copy of an UFP prepared for the Site.
11. Provide the Site Auditor with a copy of other reports that may have been prepared for ASBJV dealing with contamination at the Site.
12. Provide the Site Auditor with documentation dealing with demolition work relevant to this site audit. This information should include:
    a) Copies of HAZMATs prepared for each structure that was to be demolished;
    b) Documentation showing that all hazardous building materials were removed prior to demolition;
    c) Documentation showing that demolition work was undertaken in accordance with Australian Standard AS2601-2001;
    d) Copies of asbestos clearances prepared by a suitably licensed occupational hygienist/ environmental consultant for each demolition area at the site showing each demolition area was cleared of asbestos prior to the commencement of other site work;

e) Documentation showing that fuels and other wastes in UST / workshop infrastructure were removed and disposed by suitably licensed contractors in accordance with EPA requirements. Copies of liquid waste disposal dockets needed to be provided;

f) Documentation showing that USTs and other underground structures associated with fuel / oil storage were decommissioned and removed in accordance with SafeWork NSW and EPA requirements. Copies of tank destruction certificates from suitably licensed tank receiving companies needed to be provided. Excavations needed to be validated in accordance with EPA guidance; and

g) In the event that pavements / slabs covering the ground surface were removed and the underlying soils exposed, a grid-based asbestos survey of the ground needed to be undertaken in accordance with the NEPM (2013) Schedule B2 guidelines.

13. Provide the Site Auditor with summary information on waste classification and documentation of waste management removed from the Site. This information should include, among other things, details on the methodology used to manage waste generated at the site and how it was tracked from cradle-to-grave, plans showing where excavations were undertaken, data on the size of the excavations and the volume of excavation spoil generated and needed to be removed from the site, examples of waste classification reports, a summary table of waste removed from the Site[42].

14. Data on any soil vapour monitoring undertaken during construction work at the Site.

15. Data on the quality of groundwater that was intercepted during construction work at the Site and how this water was treated and disposed.

16. Provide the Site Auditor with documentation that showed:

a) Tasks 2 - 7 specified by the Alliance 2019 DSI were undertaken in accordance with NSW Government environmental legislation;

b) The Site was managed in accordance with the SEMP, EMP, the UFP and EPL 21149;

c) Contamination interfered or disturbed by ASBJV during the course of carrying out its work was properly managed;

d) Contamination was not generated at the PBR site by the ASBJV work;

e) No increase in contamination migrating from the Site was caused by the ASBJV work; and

f) The final condition of the Site was left in a condition suitable for a road construction worksite.

[42] The information should include among other things the date material was removed from the site, a description of the material, volume, waste classification, contractor who removed the waste from the site, location where the waste was disposed, quantity of material disposed based on tip dockets

3. Contamination Management During ASBJV Work

This section of the SAR reviews documentation provided by ASBJV concerning how contamination risks were managed by ASBJV at the PBR site during the WestConnex Stage 3A Project. The reviews comprise:

- *Review of additional ESAs and management plans (Section 3.1);*
- *Compliance with EPA notification requirements (Section 3.2);*
- *Demolition of above ground structures (Section 3.3);*
- *Removal of USTs and associated remediation (Section 3.4);*
- *Removal of other below ground structures (Section 3.5);*
- *Construction activities at Site (Section 3.6);*
- *Waste classification and management (Section 3.7);*
- *Imported fill (Section 3.8);*
- *Final site condition (Section 3.9); and*
- *Review of LTEMP (Section 3.10).*

3.1 Review of Additional ESAs and Management Plans

As previously discussed in **Section 1.2.1**, the Site Auditor understood that the site audit needed to review:

- Site environmental management plans that dealt with contamination at the PBR site and to check whether these plans met the aspects of Condition C22 of the Planning Consent and Condition O5.11 of EPL 21149, as relevant to this site audit;
- An Unexpected Contaminated Land and Asbestos Finds Procedure that met Condition E185 of the Planning Consent; and
- Contamination assessments for the PBR site and whether they met Condition E181 of the Planning Consent relevant to this site audit.

3.1.1 Investigation of Visible Asbestos at Exposed Ground Surface

In the review of the site management strategy in **Section 2.14.2**, recommended that in the event that pavements / slabs covering the ground surface were removed and the underlying soils exposed, a grid-based asbestos survey of the ground needed to be undertaken in accordance with the NEPM (2013) Schedule B2 guidelines.

The documentation provided by ASBJV indicated that no such grid-based asbestos survey was undertaken across the Site. The Site Auditor considered this data gap was not a significant issue for the purpose of this site audit since major earthworks and construction work were subsequently undertaken that would have removed and/or covered any visible asbestos that was present when demolition work was completed at the PBR site in early 2019.

3.1.2 Site Environmental Management Plan

The documentation provided by ASBJV (Ref [6]) included a site environmental management plan (**SEMP**) prepared by LSBJV for the Project dated 10/10/18 (Ref [53]). The purpose of the plan was to describe how the Contractor proposed to manage site establishment works at the various surface area worksites, one of which was the PBR site. A summary of the proposed site establishment work is provided in **Table 3-1**.

Table 3-1 Scope of Site Establishment Work for Project (Source: Table 1-1, Ref [53])

No	Site	Site establishment works									
		Demolition of existing structures	Removal of vegetation	Management of contamination	Erection of site fencing / hoarding	Provision of utility services to the site	Site levelling	Provision of site access	Erection of demountable buildings	Provision of hardstand areas	Provision of erosion and sedimentation controls
C1b	Parramatta Road West civil site	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C3b	Parramatta Road East civil site	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C9	Pyrmont Bridge Road tunnel site	✓		✓	✓	✓	✓	✓	✓	✓	✓
C10	Campbell Road civil and tunnel site			✓	✓	✓	✓	✓	✓	✓	✓

The plan provided a detailed set of procedures for a wide-range of environmental issues, which included among other things contamination. With regard to contamination, the SEMP[43] advised that:

- The EIS identified the PBR site as potentially contaminated land primarily due to mechanical workshops on the site that may have stored and handled oils, fuels and solvents and the presence of USTs. Contaminants of potential concern included metals, TRH, BTEXN, PAHs, VOCs, asbestos and PCBs;
- The SEMP noted the conditions of consent relevant to contamination that needed to be met by the Project, as described in **Section 1.2.1**; and
- The site establishment works at all locations were to be managed in accordance with the management and mitigation measures listed in Appendix B of the SEMP.

The Site Auditor was not provided with a copy of the SEMP until 7/10/21 after the demolition and ground disturbance work at the PBR site had been completed in 2019. The Site Auditor considered this delay in providing the SEMP was not a significant issue for the purpose of the site audit since this SAR reviews and assesses compliance with the matters relevant to contaminated land management raised by the Project contract, planning consent and EPL, as described in **Section 1.2.1**.

[43] Sections 4.8.2 & 5.2.11, Ref [53]

3.1.3 Contaminated Land Management Sub-plan

The documentation provided by ASBJV included a contaminated land management sub-plan (**CLMP**) prepared by LSBJV for the Project dated October 2018 (Ref [54]). The plan formed part of the Soil and Surface Water Management sub-plan (Ref [57]), which in turn formed Appendix B5 of the CEMP.

The purpose of the CLMP was to:

- Describe how the Contractor proposed to manage contaminated land during construction of the Project;
- Establish a set of best practice procedures for the identification and management of contaminated land and materials if encountered during construction work; and
- Address a contractual condition that required a CLMP to be included in the CEMP that needed to comply with the CLM Act, Roads and Maritime publication "*Contaminated Land Management Guideline*", Roads and Maritime "*Environmental Incident Classification and Reporting Procedure*", and EPA guidelines on contaminated land management.

The CLMP described:

- **Environmental requirements**: Relevant legislation and guidelines, Minister's Conditions of Approval, Revised environmental management measures;
- **Existing environment**: Previous investigations, further investigations;
- **Environmental aspects and impacts:** Construction activities, impacts;
- **Management process**: Phase 1 environmental site assessment, phase 2 sampling, analytical and quality plan, phase 2 environmental site assessment, remediation action plan, remediation validation report, long-term site environmental management plan, site audit report and site audit statements;
- **Environmental control measures**;
- **Compliance management**: Roles and responsibilities; training, monitoring and inspections, auditing, reporting;
- **Review and improvement**: Continuous improvement, CLMP update and amendment;
- **Unexpected contaminated lands and asbestos finds procedure** (Ref [55]); and
- **Asbestos management plan**.

The Site Auditor was not provided with a copy of the CLMP until 7/10/21 after the demolition and ground disturbance work at the PBR site had been completed in 2019. The Site Auditor considered this delay in providing the CLMP was not a significant issue for the purpose of the site audit since:

- The CLMP only provided a framework for contaminated land management and largely repeated the requirements of the Project contract, planning consent and EPL; and
- This SAR reviews and assesses compliance with the matters relevant to contaminated land management raised by the Project contract, the planning consent and EPL, as described in **Section 1.2.1**.

3.1.4 Waste Management Plan

<u>**Purpose**</u>

The documentation provided by ASBJV included a waste management plan (**WMP**) prepared by LSBJV for the Project dated 31/10/18 (Ref [56]). The purpose of the plan was to describe how the Contractor proposed to manage waste generated by demolition work at the PBR site.

General Requirements

The WMP advised that waste generated during demolition work at the PBR site was to be generally managed in accordance with the CEMP Waste Management Sub-plan, which required:

- Waste was to be managed in accordance with the waste hierarchy priorities:
  - Waste generation was to be avoided;
  - Where avoidance was not reasonably practicable, waste generation was to be reduced;
  - Where avoiding or reducing waste was not possible, waste was to be reused, recycled, or recovered on site or off site; and
  - Where waste reuse, recycling or recovery was not possible, waste was to be treated and/or disposed at a waste management facility or premise lawfully permitted to accept the materials or in accordance with a Resource Recovery Exemption (**RRE**) or Order (**RRO**) issued under the POEO (Waste) Regulation 2014, or to any other place that can lawfully accept such waste.
- Waste needed to be segregated between recyclable and non-recyclable waste, as well as between categories of recyclable wastes. Wherever possible, packaging needed to be avoided or minimised
- Obtaining relevant licenses / approvals for off-site waste facilities utilised for the disposal of Project waste
- Waste needed to be managed and disposed of in accordance with the POEO Act 1997
- All waste generated during construction needed to be classified in accordance with the EPA (2014) Waste Classification Guidelines
- Suitably licensed waste contractors needed to be used for the collection and transport of all non-domestic, retail and commercial wastes for either off-site processing and/or disposal to an appropriately licensed facility.

The Site Auditor considered these general requirements were appropriate and met EPA requirements.

Estimated Quantities

The WMP advised that:

- Material generated from demolition activities at the PBR site that could not be reused on-site required disposal. The expected waste types, volumes and details on disposal sites provided by the WMP are summarised in **Table 3-2**;
- All waste was to be classified in accordance with the EPA (2014) Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes; and
- Details of waste types, volumes and destinations were to be recorded in a Waste and Spoil Management Tracking Register.

The Site Auditor noted these waste types and estimated quantities when reviewing the actual wastes generated by the construction activities undertaken at the PBR site, which is reviewed in **Section 3.7**.

Table 3-2 Waste Types, Volumes & Disposal Sites Estimated by ASBJV (Source: Table 2-1, Ref [56])

Waste Type	Estimated Waste Volume (tonnes)	Waste Disposal Site	Address	EPL No.
Scrap Metal/ Structural Steel	1500	Metropolitan Demolitions & Recycling (MDR) Facility, St Peters	396 Princes Highway, St Peters, NSW 2044	11483
		Sell & Parker	23-43 And 45 Tattersall Road, Kings Park NSW 2148	11555
Concrete/Brick (Rubble)	5237	Metropolitan Demolitions & Recycling (MDR) Facility, St Peters	396 Princes Highway, St Peters, NSW 2044	11483
Asbestos	8	Suez Environmental, Kemps Creek	1725 Elizabeth Drive, Kemps Creek, NSW 2178	4068
General Waste (Rubbish)	800	Enviroguard, Erskine Park	50 Quarry Rd, Erskine Park, NSW 2759	4865
		Blacktown Waste Services, Marsden Park	25 Harris Avenue, Marsden Park, NSW 2765	11497
		Dial A Dump Industries	76-82 Burrows Road Alexandria NSW 2015	4679
Timber	10	Metropolitan Demolitions & Recycling (MDR) Facility, St Peters	396 Princes Highway, St Peters, NSW 2044	11483

3.2 Compliance with EPA Notification Requirements

As previously discussed in **Section 1.2.1**, the Site Auditor understood that the site audit needed to determine whether contamination at the PBR site was present and needed to be notified to ASBJV, TfNSW and the EPA under the CLM Act.

The Site Auditor considered that contamination present at the PBR site did not need to be notified because:

- The level of contamination identified by the ESAs was consistent with the levels found as part of the development consent process which involved the review of the data by TfNSW, DPE and the EPA;
- The data produced by the ESAs indicated that the level of soil contamination identified by the ESAs was localised and relatively minor (**Sections 2.7 – 2.13**);
- There was a low risk of construction activities causing an increase in contamination migrating off-site;
- The Site had not previously been regulated or notified to the EPA;

- The weight of evidence indicated that construction activities undertaken at the Site reduced the amount of contamination at the Site. This was achieved through the removal of USTs and their contents, the excavation and removal of fill and other contaminated material from the Site; and
- A concrete capping layer was to be maintained across the Site.

3.3 Demolition of Above Ground Structures

The CSM identified the demolition of structures at the PBR site as a potentially contaminating activity (**Section 2.4**). This section of the SAR reviews the documentation provided by ASBJV on the demolition of above ground structures.

3.3.1 HAZMATS

Documentation provided by ASBJV (Ref [6]) indicated that two HAZMATs prepared for the PBR site prior to the commencement of demolition work. These were:

- Ref [59]: JM Environments (19 September 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey*". Document No: JME18057-3-1 provided for LSBJV (
- Ref [60]: JM Environments (9 November 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey - 2*". Document No: JME18057-11 provided for LSBJV

The parts of the PBR site covered by these HAZMATs are shown in **Figures 3-1** and **3-2**.

Figure 3-1 Areas Covered by JME (19/09/18) HAZMAT at PBR Site (Source: Figure 1, Ref [59])

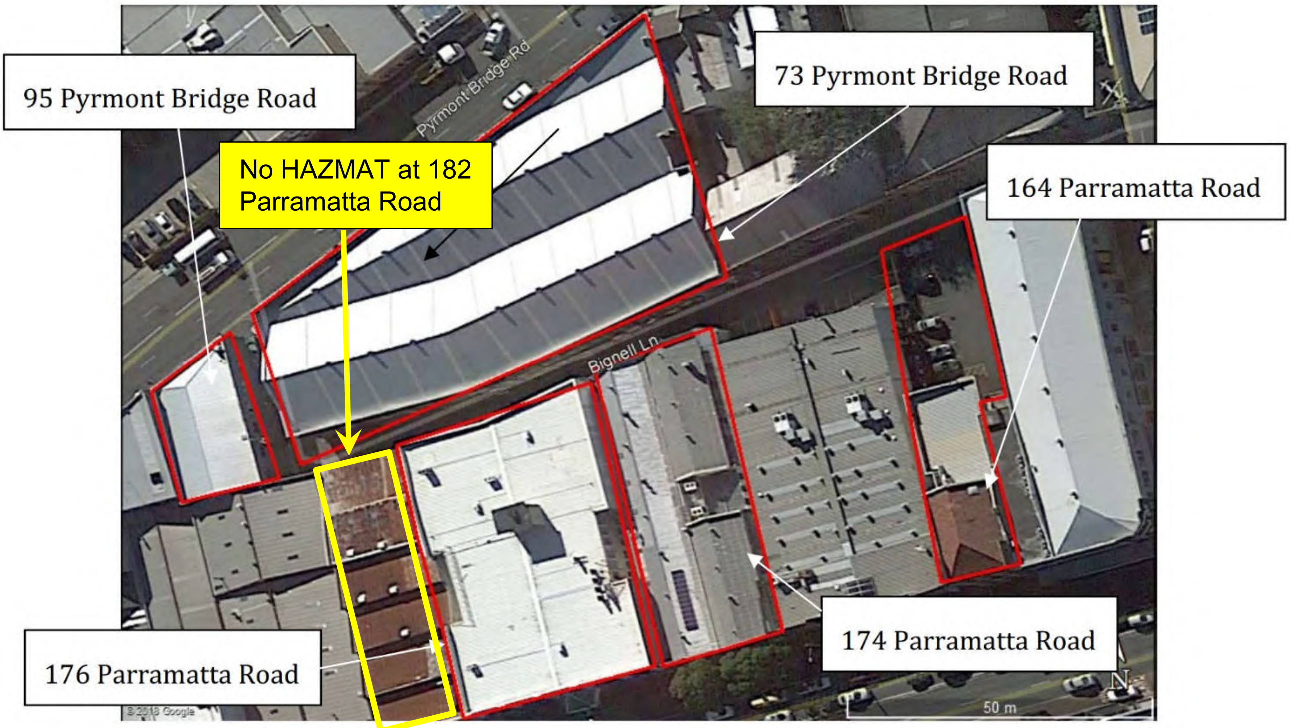
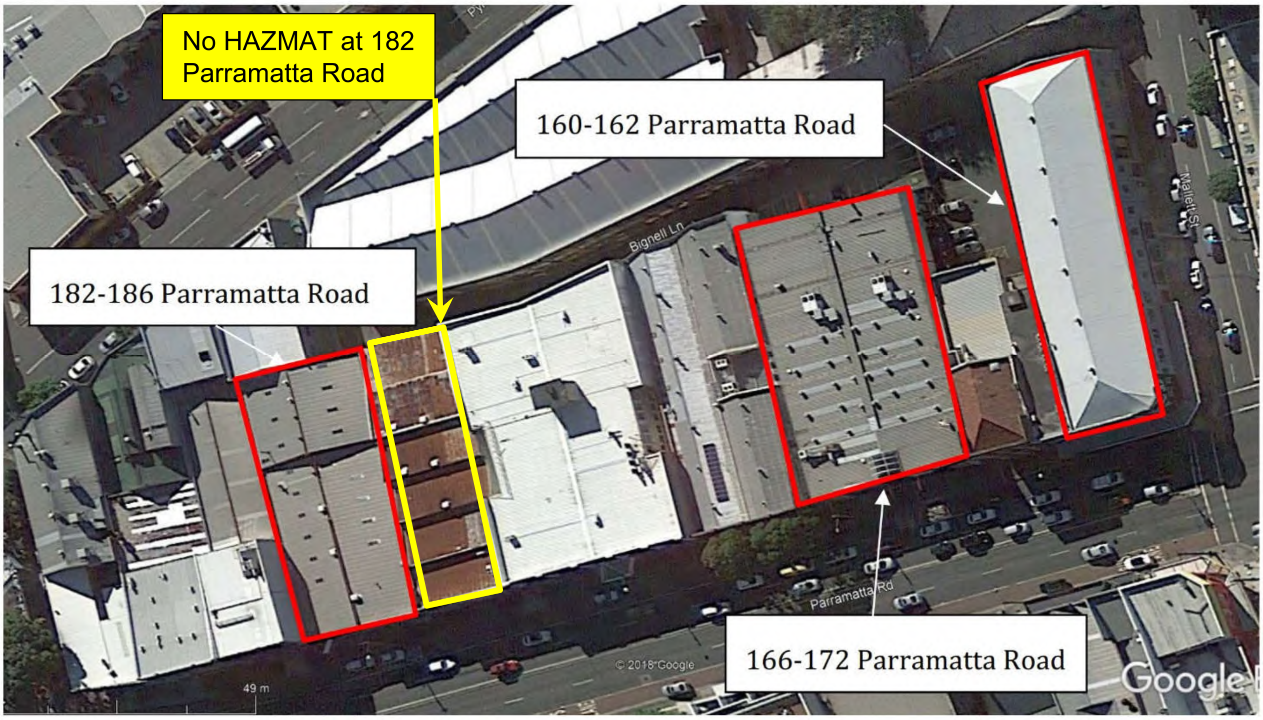


Figure 3-2 Areas Covered by JME (9/11/18) HAZMAT at PBR Site (Source: Figure 1, Ref [60])



The data indicated that HAZMATs were conducted across practically all developed parts of the PBR site, the exception being 182 Parramatta Road (Property 3 in the Stage 2 area). The Site Auditor addressed this data gap by considering the contamination risks posed by demolition work at this location when reviewing the documentation provided on the demolition work conducted at the PBR site.

The Site Auditor considered the weight of evidence supported the conclusion that the HAZMATs were undertaken in general compliance with good practice and regulatory requirements because:

- The HAZMATs were prepared by suitably qualified and licensed occupational hygienists
- The purpose of each survey was to identify hazardous construction materials such as ACM, lead based paints; synthetic mineral fibre (**SMF**) and PCBs
- The scope of works involved:
  - Liaise with personnel and collect data on the history, use and function of the Site;
  - Survey the property to identify hazardous materials;
  - Review previous audits and remedial works undertaken at the property;
  - Compile an up to date Hazardous Materials Register for the Site; and
  - Make recommendations for the ongoing management / removal of the asbestos / hazardous materials.
- The JM Environments (19/09/18) HAZMAT (Ref [59]) found:
  - 75 Pyrmont Bridge Road – Friable asbestos containing dust on roof support beams; presumed bonded ACM in an electrical distribution board;
  - 93 Pyrmont Bridge Road – Bonded ACM in a stormwater cement fibre pipe;
  - 164 Parramatta Road – Presumed friable asbestos infill in 9 fire rated doors; Presumed bonded ACM in an electrical distribution board;

- 174 Parramatta Road – Friable asbestos in a door seal of a safe; presumed friable asbestos infill in one fire rated door; and
- 176 Parramatta Road – Friable asbestos infill a fire rated door; bonded ACM in fibre cement window infills at the rear; presumed bonded ACM in 6 electrical distribution boards.

➢ The JM Environments (9/11/18) HAZMAT (Ref [60]) found:

- 166 - 1724 Parramatta Road – Presumed friable asbestos infill in 4 fire rated doors; and
- 182 - 186 Parramatta Road – Presumed bonded ACM in 2 electrical distribution boards.

The Site Auditor considered that the missing HAZMAT for 182 Parramatta Road was not a significant matter for this purpose of this site audit since major earthworks and construction work were subsequently undertaken that would have removed and/or covered any visible asbestos or other type of hazardous building material that was present when demolition work was completed at the PBR site in early 2019.

3.3.2 Demolition Work

The CWMS (Ref [61]) advised that the demolition work to be undertaken at the PBR site was to comprise:

➢ Install temporary site fencing;

➢ Remove contaminated waste material from Site;

➢ Progressive demolition of properties upon progressive decommissioning of services; and

➢ Remove waste material from Site.

The demolition work was needed across the entire PBR site as shown in the ASBJV plan in **Figure 3-3**.

Figure 3-3 ASBJV Location Plan for Demolition Work at PBR Site (Source: Figure 2, Ref [61])

The Site Auditor considered the CWMS was a well prepared document that would allow the demolition work to be undertaken in general accordance with regulatory requirements if followed. This is because the CWMS provided:

- Planning details such as the scope of work, location of work, references, program and resources
- Work health and safety details such as emergency response planning, risk assessment and safe work method statements
- Environment details such as sub-plans, environmental work method statements, surveillance of the works and risk assessment
- Community and stakeholder details
- Quality details such as inspection and test plans, hold and witness points relevant to the works
- Work Method and sequencing
- The appendices provided:
  - A detailed program;
  - HAZMATs;
  - High level risk assessment;
  - Construction noise and vibration impact statement;
  - Sensitive areas;
  - Copy of community notification;
  - Inspection and Test Plan (**ITP**) for the demolition of existing structures;
  - Vehicle movement plan;
  - Subcontractor’s demolition work plan; and
  - Subcontractor’s project risk assessment.

It was likely that the demolition of buildings at the PBR site occurred after October 2018 (when the CWMS for demolition work was prepared) and up to May 2019 (when the sixth asbestos clearance certificate was issued.

The Site Auditor identified data gaps in the documentation provided on the demolition work conducted at the PBR site. These included:

- Safe Work Method Statements (**SWMS**s) prepared by the hazardous building material removalist and the demolition contractor;
- Construction drawings showing the structures that needed to be demolished;
- Notifications to Safework NSW for the proposed asbestos removal work and demolition work; and
- Site diary records prepared by ASBJV for the period the site supervisor / engineer inspected the demolition work.

The Site Auditor considered the weight of evidence supported the conclusion that demolition work at the PBR site was likely to have been undertaken in general compliance with regulatory requirements because the documentation provided by ASBJV (Ref [6]) included:

- The asbestos clearance reports indicated that hazardous building materials were removed by:
  - Australasian Technical Services (**ATS**), a Class A licensed asbestos removalist for friable asbestos (licence No: AD212177); and
  - Access Quality Services, a Class B licensed asbestos removalist for non-friable asbestos (Licence No: AD211282).
- A well prepared CWMS was prepared for the demolition work;
- The demolition work required compliance with inspection and test plans;

- The demolition program included hold and witness points relevant to the work;
- The scope of demolition work conducted at the Site is shown in **Figure 3-3**;
- Asbestos clearance reports were provided for the period of the demolition work, which are reviewed in **Section 3.3.4**;
- The demolition work appears to have been undertaken by Metropolitan Demolitions, based on a copy of a Safework NSW demolition licence provided by ASBJV[44]; and
- The Site Auditor observed that all demolition waste had been removed from the PBR site when inspected on 2/06/21, as shown by photos provided in **Appendix D**.

3.3.3 Disposal of Demolition Waste

No data on wastes generated by the demolition work undertaken at the PBR site was provided for review. The Site Auditor considered this data gap was not a significant matter for the purpose of this site audit because:

- Aerial photos provided for the March – July 2019 period following the completion of demolition work (**Figure 3-11**) showed all stockpiles of demolition waste had been removed from the Site;
- Other data provided by ASBJV did not indicate that any demolition waste remained at the Site when excavation work was commenced at the Site;
- Demolition waste would have been geotechnically unsuitable for use as compacted backfill during construction of the tunnel support facilities at the PBR site;
- The Site Auditor observed no demolition waste remaining at the Site when an inspection was undertaken on 2/06/21; and
- The removal and off-site disposal of demolition waste did not affect the suitability of the Site for its intended use as a road construction worksite.

3.3.4 Site Auditor Overview

The CSM identified the demolition of structures at the PBR site as a potentially contaminating activity (**Section 2.4**). Following the completion of ESAs, construction activities were undertaken at the PBR site by ASBJV, which involved the demolition of above ground structures.

While some data gaps existed in the documentation provided by ASBJV, the Site Auditor considered the weight of evidence supported the conclusion that the demolition work posed a low risk of generating additional contamination or of disturbing contamination that was present below ground. This is because:

- Major earthworks and construction work were subsequently undertaken that would have removed and/or covered any visible asbestos or other type of hazardous building material that was present when demolition work was completed at the PBR site in early 2019;
- Demolition work at the PBR site was likely to have been undertaken in general compliance with regulatory requirements for the reasons given in **Section 3.3.2**; and
- No demolition waste remained at the Site for the reasons given in **Section 3.3.3**.

[44] Comment 12, Ref [6]

3.4 Removal of USTs and Associated Remediation

The CSM (**Section 2.4**) identified USTs and associated infrastructure (APEC 2) as areas of potential environmental concern (**APECs**) that posed contamination risks at the PBR site.

With regard to contamination risks posed by USTs, the Alliance 2019 DSI[45] and the Site Auditor (**Section 2.14**) recommended that ASBJV needed to:

- Remove / validate the identified USTs as per the Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008);
- Further assess odours, staining and sheen to address the potentially unacceptable aesthetics risk identified at the PBR site;
- Carry out groundwater sampling during and following bulk earthworks and following the removal / validation of the USTs (where applicable) to determine whether the identified groundwater contamination was a result of historical on-site or adjacent land use;
- Classify soils or liquid needing to be disposed off-site as per the NSW EPA Waste Classification Guidelines (2014);
- Provide documentation showing that fuels and other wastes in UST / workshop infrastructure were removed and disposed by suitably licensed contractors in accordance with EPA requirements. Copies of liquid waste disposal dockets needed to be provided; and
- Provide documentation showing that USTs and other underground structures associated with fuel / oil storage were decommissioned and removed in accordance with SafeWork NSW and EPA requirements. Copies of tank destruction certificates from suitably licensed tank receiving companies needed to be provided. Excavations needed to be validated in accordance with EPA guidance.

3.4.1 Removal of USTs

Documentation provided by ASBJV (Ref [6]) included:

- 22/08/18: A methodology for the removal of USTs prepared by Metropolitan Demolition;
- Undated: An excavation and backfill methodology adopted by ASBJV for the removal of USTs at the PBR site, which is shown in **Figure 3-4**;
- 9/10/18: A waste classification report (**WCR**) prepared by JM Environmental for liquid waste in USTs 1, 3 and 4 located at 79 PBR and 174 Parramatta Road;
- 17/12/18: LSBJV plans showing the locations of known USTs that needed to be removed from the PBR site by Metropolitan Demolition, with copies provided in **Figure 3-5**;
- 5/02/19: Liquid waste tracking dockets prepared by Remondis for 8,500 L of recovered fuel from UST 1;
- 14/02/19: Hot work permit and degassing certificate issued by T&V Grainger to Metropolitan Demolition for a UST at the PBR site;
- 18/02/19: Tank destruction certificate issued by Sell & Parker for four USTs removed from the PBR site by Metropolitan Demolition on 16/02/19 (total weight 2.58 T);
- 25/02/19: A photo taken by the ASBJV site supervisor / engineer of a UST found at the former Drummond Golf store at Property 1 located in the NW corner of the PBR site, with a copy provided in **Figure 3-6;**
- 14/03/19: Tank destruction certificate issued by Sell & Parker for two USTs removed from the PBR site by Metropolitan Demolition on 25/02/19;
- 25/03/19: A SWMS for the decommissioning and removal of USTs at the Site prepared by Metropolitan Demolition;

[45] Section 11, Ref [5]

Figure 3-4 ASBJV Methodology for Removing USTs & Excavation Backfilling (page 1 of 2) (Source: Comment 12, Ref [6])

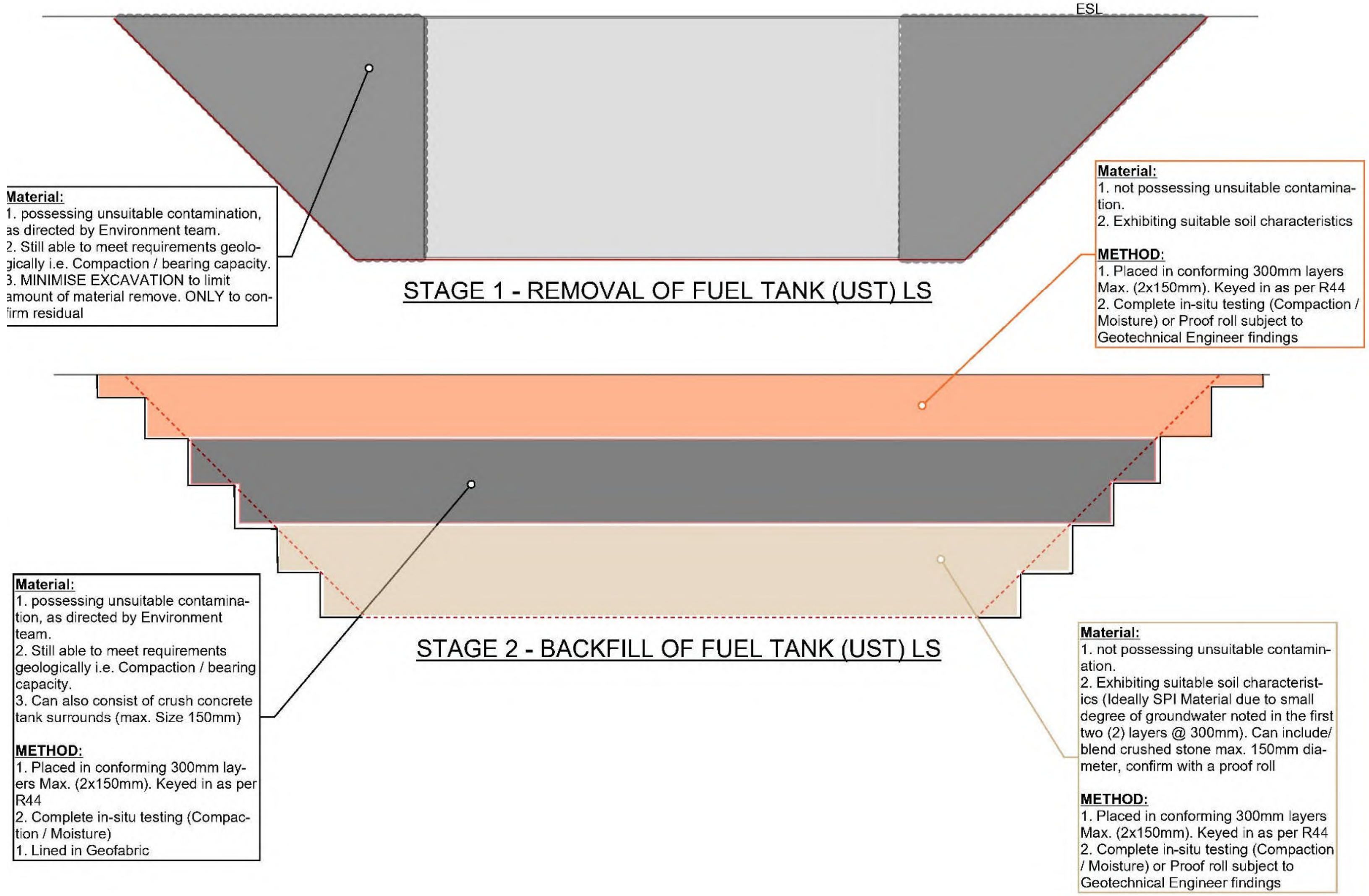


Figure 3-4 ASBJV Methodology for Removing USTs & Excavation Backfilling (page 2 of 2) (Source: Comment 12, Ref [6])

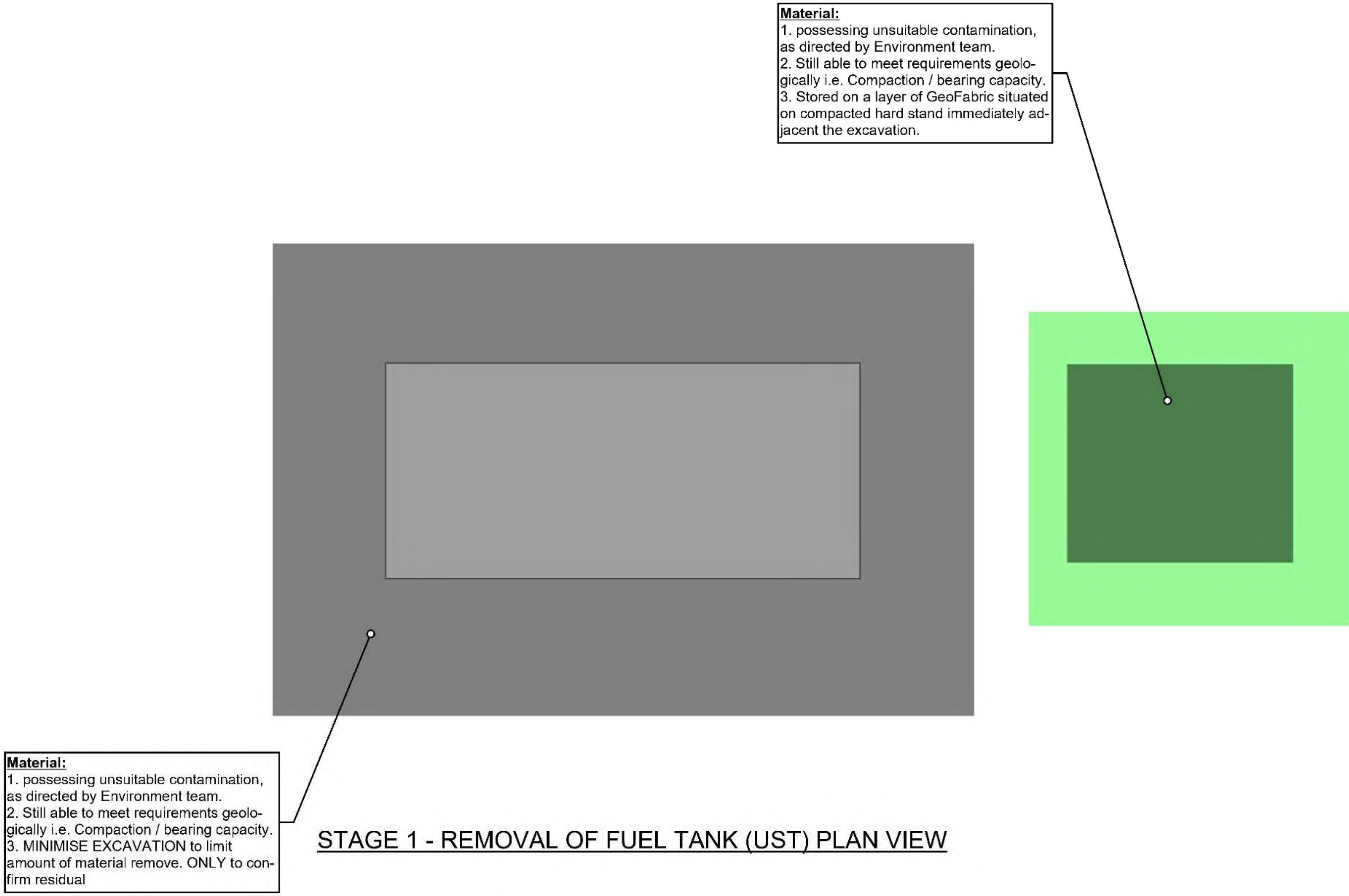


Figure 3-5 LSBJV Plans for Removal of Known USTs (page 1 of 3) (Source: Comment 16, Ref [6])

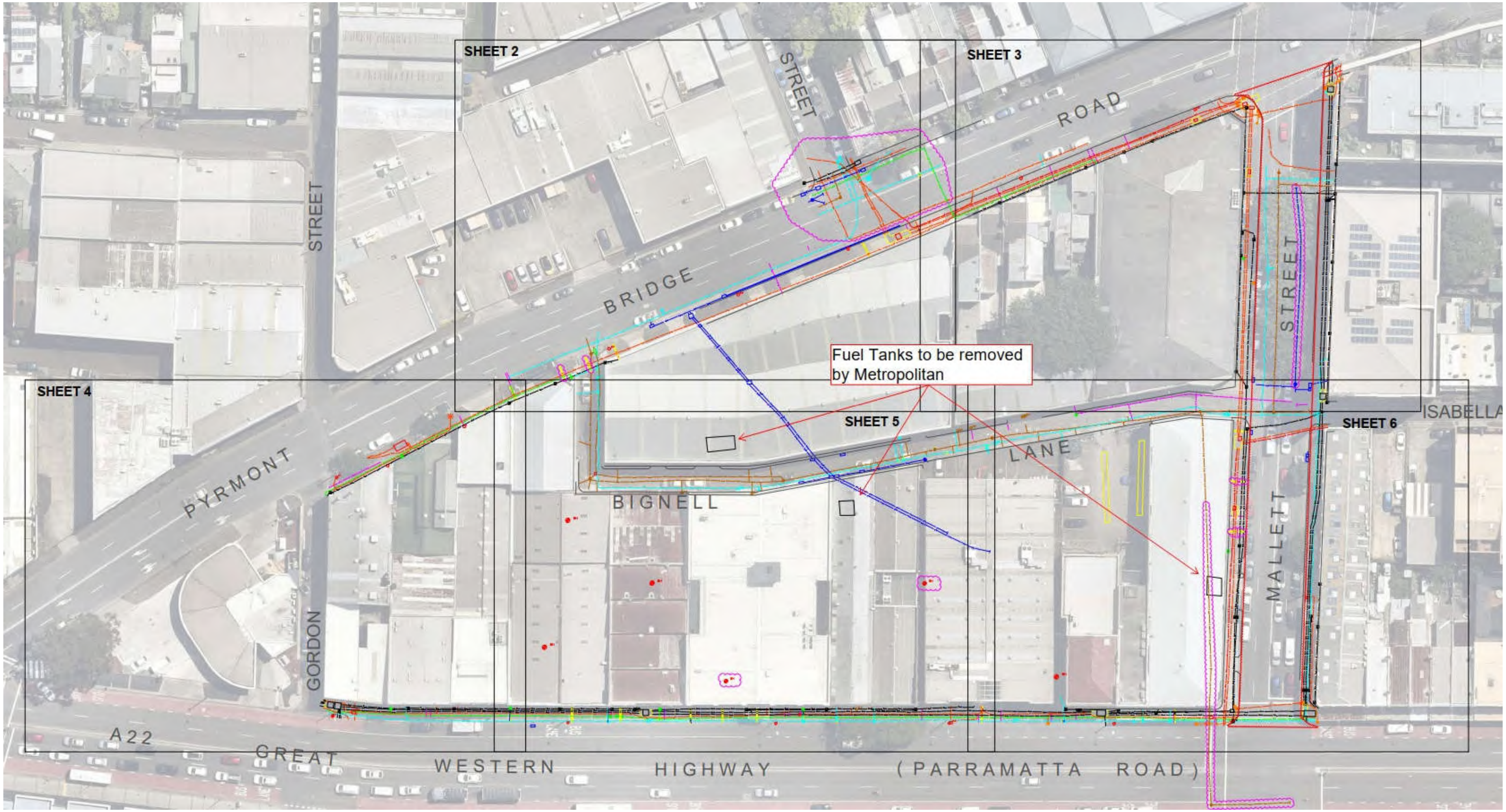


Figure 3-5 LSBJV Plans for Removal of Known USTs (page 2 of 3) (Source: Comment 16, Ref [6])

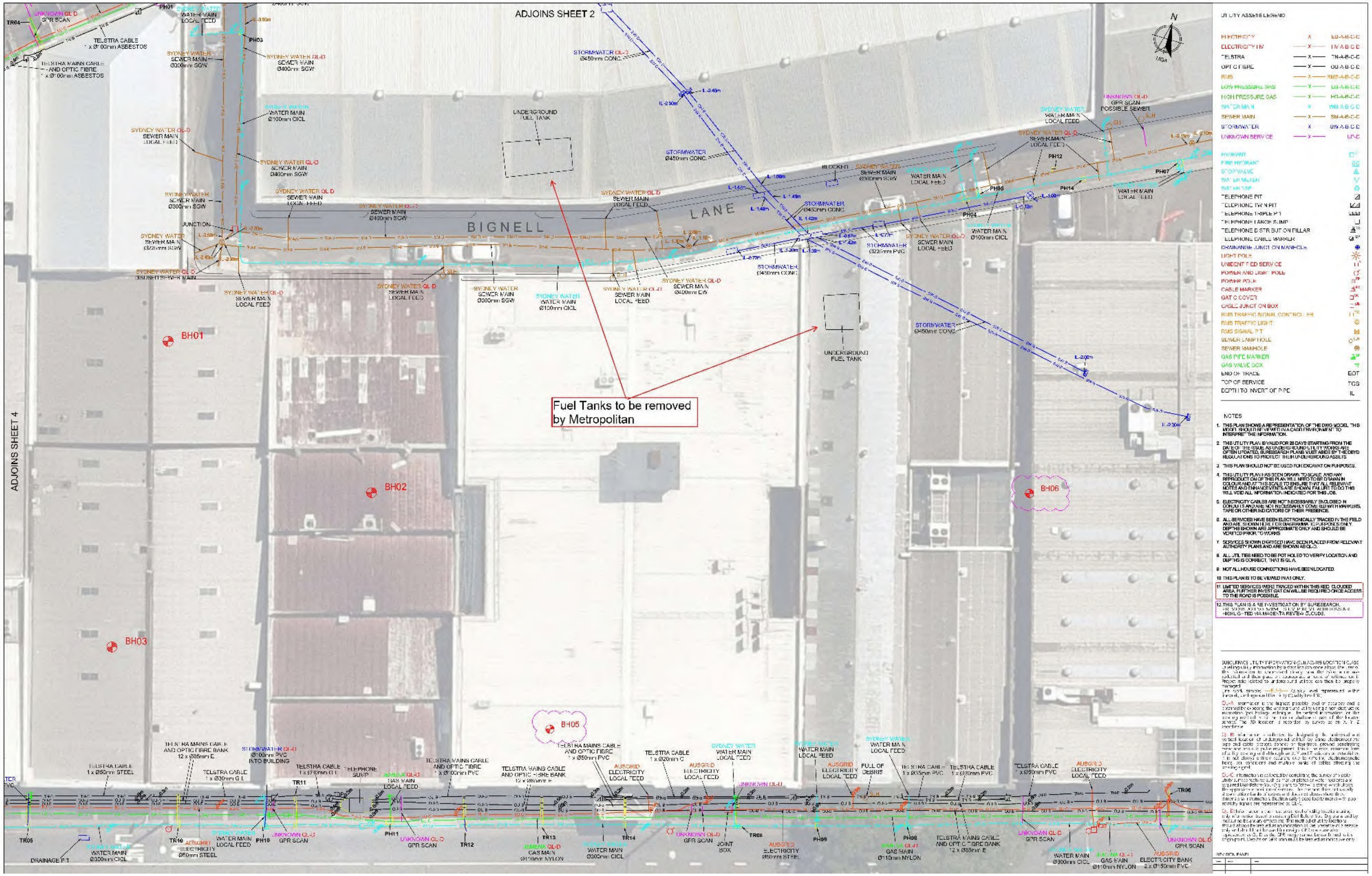


Figure 3-5 LSBJV Plans for Removal of Known USTs (page 3 of 3) (Source: Comment 16, Ref [6])

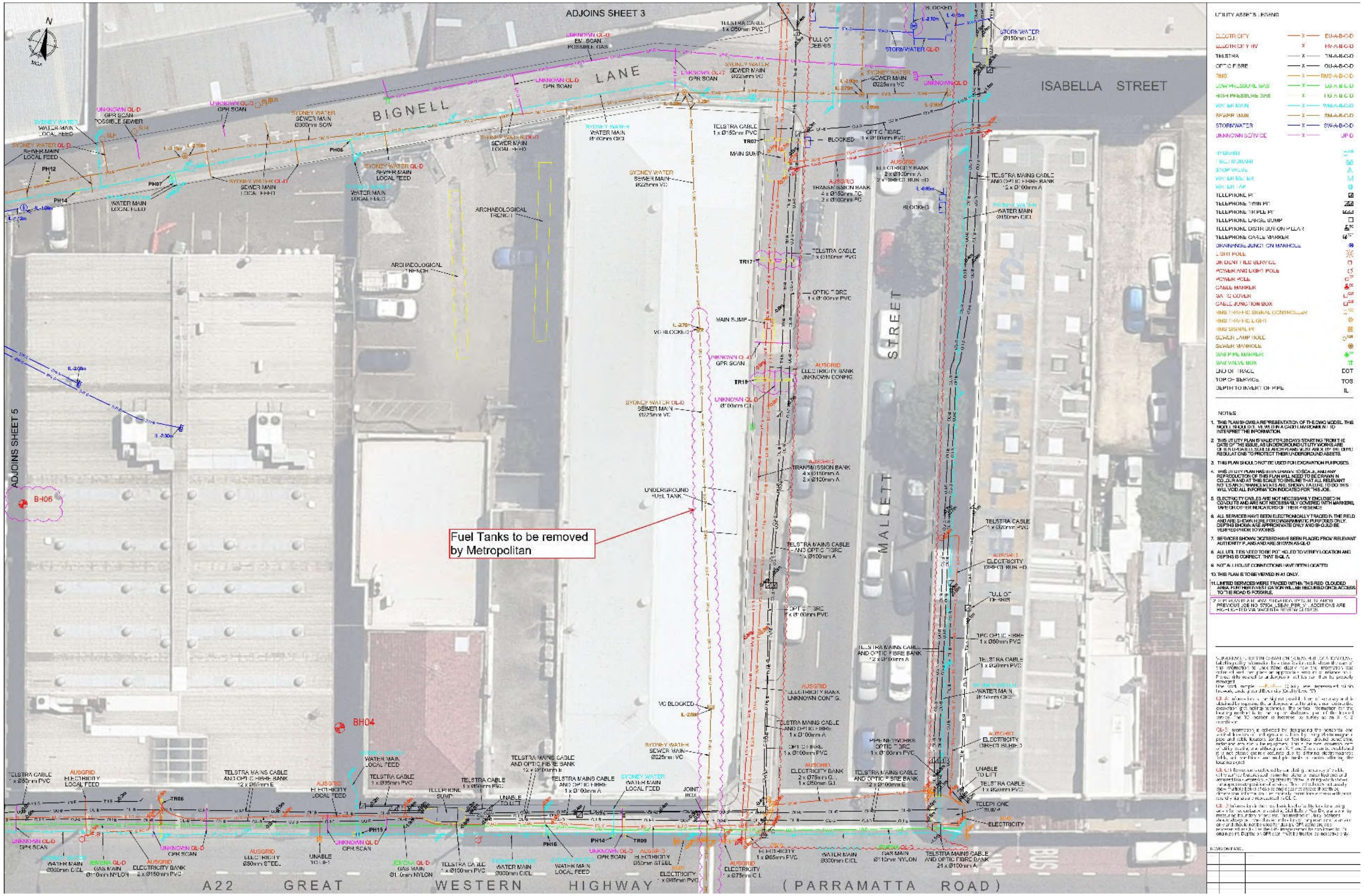
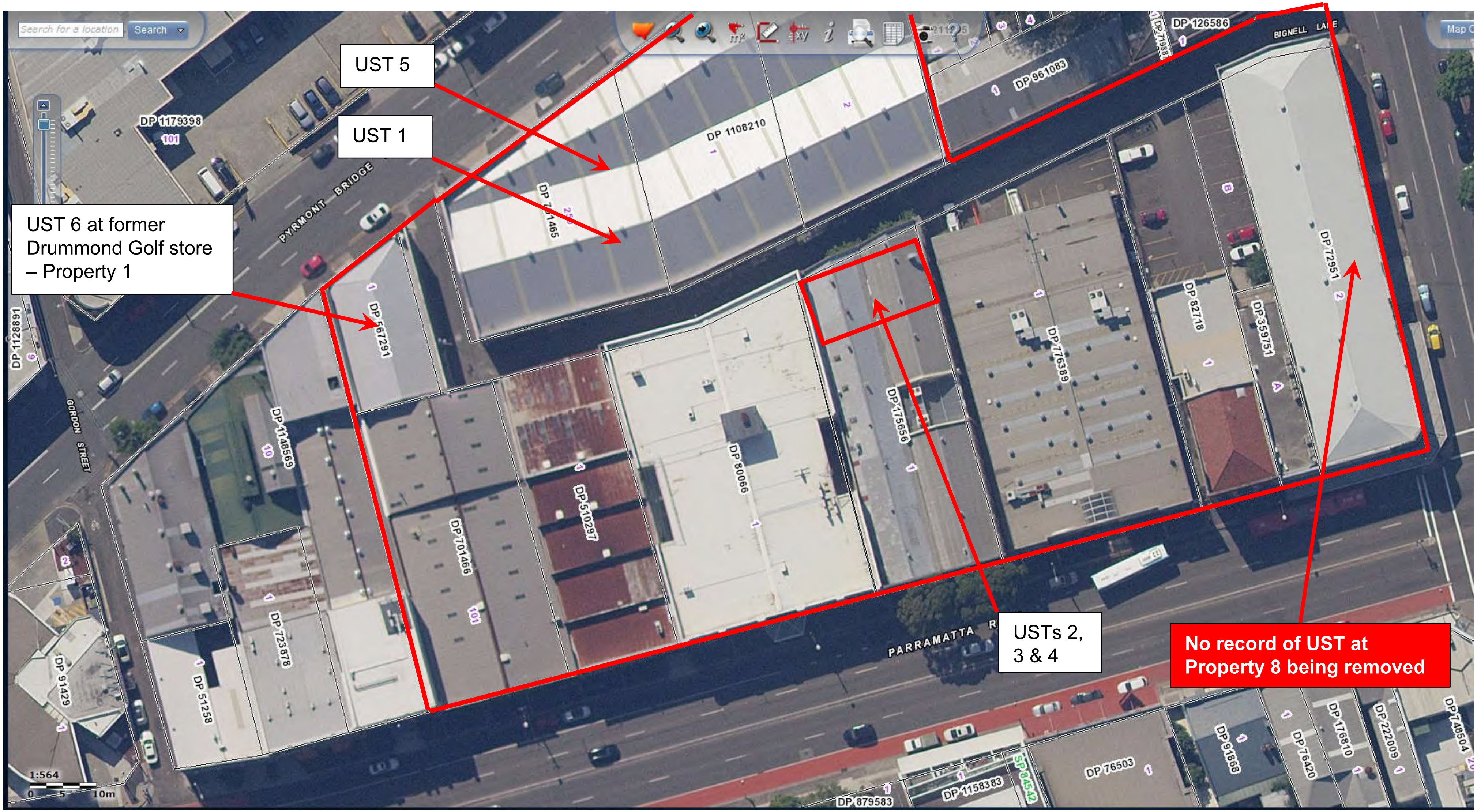


Figure 3-6 Photo of Unexpected UST found at Property 1 on 25/02/19 (Source: Comment 16, Ref [6])

- 15/04/19: Tank destruction certificate issued by Sell & Parker for a UST removed from the PBR site by Metropolitan Demolition on 11/04/19 (weight 0.56 T);
- 11/04/19: Hot work permit and degassing certificate issued by T&V Grainger to Metropolitan Demolition for a UST at the PBR site; and
- A sketch plan prepared by ASBJV showed that six USTs were recorded as having been removed from the PBR site, with their approximate locations shown in **Figure 3-7**.

Figure 3-7 Approximate Locations of USTs Removed by ASBJV from PBR site



The Site Auditor identified deficiencies in data provided by ASBJV concerning the removal of USTs at the PBR site. These included:

- No field records were provided showing whether any liquid waste was present in USTs 2, 5 and 6, and if so, a WCR report for the liquid waste and liquid waste tracking and disposal dockets;
- No field records were provided showing that hot work permits and degassing certificates were prepared for all USTs removed from the Site;
- No field records were provided showing the size and condition of USTs removed from the Site;
- No field record was provided showing the level of supervision provided by the ASBJV site supervisor / engineer during the decommissioning and removal of the USTs;
- A tank destruction certificate was not provided for one of the six USTs removed from the Site; and
- No documentation was provided on whether the UST at the eastern part of the Site (Property 8) was removed.

Despite these deficiencies, the Site Auditor considered it was likely that six USTs were removed from the PBR site in general accordance with regulatory requirements. This is because:

- An ASBJV site supervisor and engineer was assigned to the construction work undertaken at the PBR site, which included the removal of USTs;
- The UST removal work was undertaken by Metropolitan Demolition, an experienced and suitably licensed demolition contractor;
- Site records indicated that liquid waste was removed from USTs by Remondis, an experienced and suitably licensed liquid waste contractor;
- The UST removal methodology prepared by Metropolitan Demolition was prepared in general accordance with regulatory requirements; and
- The Site Auditor observed no UST remnants or stockpiled contaminated soil at the Site when inspections were conducted on 2/06/21 and 4/11/22.

However, the Site Auditor considered there was a risk that unknown USTs may remain on-site because:

- No methodology was provided showing how ASBJV identified USTs at the Site;
- No documentation was provided on whether the UST at the eastern part of the Site (Property 8) was removed; and
- The layout of construction work at the PBR site (**Figure 1-5**) showed that no large scale excavation or ground disturbance work was required at the eastern end of the 79 PBR area or the eastern end of the Stage 2 area. It was possible that an unknown UST may remain below the old concrete ground slab.

The Site Auditor has assessed the significance of this contamination risk in **Section 3.4.4.**

3.4.2 Waste Classification and Disposal

The ASBJV waste tracking spreadsheet reviewed in **Section 3.7.2**, showed that a total of 1,010.4 t of petroleum hydrocarbon and asbestos contaminated soil was removed from the Site and disposed at the Cleanaway Kemps Creek licensed landfill as Special Waste – asbestos (GSW) between 29/04/19 and 3/05/19. The soil was described as stained with hydrocarbon odours. The Alliance WCR #8272-ER-1-13 reported TRH C10-C36 concentrations of 1,029 to 4,380 mg/kg, with all four samples measuring non-detectible to very low TRH C6-C9 and BTEX concentrations[46].

The Site Auditor considered it was reasonable to assume that this soil was removed from around or near USTs as part of their removal because:

[46] The maximum concentrations detected were benzene at 0.2 mg/kg and toluene at 0.2 mg/kg.

- Leakage from USTs was the most likely source of petroleum hydrocarbon contamination at the Site; and
- The available documentation indicated that the USTs were removed from the Site in February – April 2019.

3.4.3 Remediation of Contaminated Soils around USTs

ASBJV advised that they were not contracted to remediate contaminated soils at UST areas. The available documentation indicated that the ASBJV tank removal and backfill methodology (**Figure 3-4**) did not involve the chasing out and remediation of contaminated soils from around a UST or the validation of contamination that remained in the area.

The methodology instead involved lining the UST excavation with geofabric followed by the placement and compaction of the contaminated soils that had been excavated when the UST was removed. Contaminated soil was to be used to backfill UST excavations up to a depth of 0.3 m below the final ground surface. A 0.3 m thick cap of soil '*not possessing unsuitable contamination'* was then to be placed in 0.15 m thick layers.

The Site Auditor considered the weight of evidence supported the conclusion that some but not all of the contaminated soil excavated from around USTs was backfilled into the UST excavation pits and was not disposed off-site. This is because while the UST tank removal and backfill methodology involved backfilling the soil in the UST excavation pits, the ASBJV waste tracking spreadsheet indicated that 1,010.4 t of petroleum contaminated soil was disposed off-site.

The Site Auditor also considered that contaminated soil possibly exceeding commercial / industrial D criteria may have been used to backfill UST pits and may remain in unexcavated soil at former UST areas. The Site Auditor has assessed the significance of this contamination risk in **Section 3.4.4**.

3.4.4 Site Auditor Overview

The CSM identified USTs and associated infrastructure (APEC 2) as posing contamination risks at the PBR site (**Section 2.4**). Following the completion of ESAs in 2019, construction activities were undertaken at the PBR site by ASBJV, which involved the removal of USTs between February and April 2019.

The Site Auditor considered the weight of evidence supported the conclusion that there was a risk of petroleum hydrocarbon contamination remaining in soils at former UST areas within the PBR site at concentrations above commercial / industrial D criteria. This is because:

- There was a risk that unknown USTs may remain on-site for the reasons given in **Section 3.4.1**;
- The UST removal methodology prepared by Metropolitan Demolition and ASBJV did not include any procedures for removing contaminated soils once the UST had been removed;
- ASBJV advised that they were not contracted to remediate contaminated soils at UST areas;
- The ASBJV tank removal and backfill methodology (**Figure 3-4**) showed:
    - Contamination around a UST exceeding commercial/industrial D SILs was not to be chased out;
    - Validation soil samples were not to be collected from the sides of a UST excavation; and
    - Contaminated soil was to be used to backfill UST excavations up to a depth of 0.3 m below the final ground surface. A 0.3 m thick cap of soil 'not possessing unsuitable contamination' was then to be placed in 0.15 m thick layers.

Despite the risk of TRH contamination at the former UST areas exceeding commercial/industrial D criteria, the Site Auditor considered the approach adopted by the ASBJV environment team to manage this contamination at the PBR site met the requirements of their contract, the planning consent and EPL, as described in **Section 1.2.1**. This is because the weight of evidence indicated that:

- ASBJV only disturbed contaminated soil required to allow the removal of USTs and that this soil was backfilled and compacted in cells located on-site;

- There was a low risk that construction work undertaken by ASBJV at the Site generated contamination;
- The ASBJV waste tracking spreadsheet (**Section 3.7.2**) indicated that 1,010.4 t of petroleum contaminated soil was disposed off-site;
- There was a low risk of petroleum hydrocarbon contaminated groundwater remaining at unacceptable concentrations because of the data obtained by the ESAs in 2019, the presence of a large decline that would have drained and removed much of the historic groundwater from the Site, and the wastewater treatment plant successfully operated for a period of 3.5 years (**Section 3.6.6**);
- The PBR site was capable of being returned to a condition suitable as a road construction worksite if it was capped and managed by a LTEMP; and
- The requirements of the EPL did affect the management of TRH contamination at the Site.

The Site Auditor considered the risks posed by TRH contamination remaining at former UST areas at the PBR site were capable of being addressed by capping the Site and managing the residual contamination by means of a LTEMP. This is because:

- The ESA data reviewed in **Section 2** indicated that exceedances of the petroleum hydrocarbon commercial/industrial criteria were not extensive and were likely to be localised and restricted to the former UST areas;
- The data reviewed in **Section 3.4** indicated that the removal of the USTs meant that the main source of petroleum hydrocarbon contamination in this area had been removed and that remaining TRH contamination in the area would degrade with time;
- The Site Auditor found no evidence that construction activities undertaken at the PBR site had generated contamination;
- A cap would prevent uncontrolled direct contact with underlying contamination that remained at the Site;
- A cap would allow any soil vapours underlying the cap to be managed;
- The required end use of the PBR site was as a road construction worksite, which was not a sensitive land use compared to residential or open space parkland; and
- At the end of construction work the PBR site would remain capped by pavements, as described in **Section 3.9**.

A LTEMP needed to be prepared to manage the risk of residual TRH contamination remaining at former UST areas within the PBR site, which is further discussed in **Section 3.10**.

3.5 Removal of Other Below Ground Structures

The CSM (**Section 2.4**) identified below ground structures as **APECs** that posed contamination risks at the PBR site. These below ground structures in addition to USTs comprised:

- APEC 3: Pits / other types of underground structures associated with chemical/waste storage; and
- APEC 11: Buried services.

3.5.1 APEC 3 Pits

The Site Auditor found no evidence of exposed pits remaining at the PBR site during inspections conducted on 2/06/21 and 4/11/22. The Site Auditor considered there was a low risk of unknown pits remaining at the Site since early work undertaken by ASBJV involved the removal of all existing buildings and pavements from the Site thereby exposing the subsurface soils.

Nevertheless, the Site Auditor considered that contamination risks associated with unknown pits at the Site could be managed by an LTEMP because:

- The ESA data reviewed in **Section 2** indicated that exceedances of the petroleum hydrocarbon commercial/industrial criteria were not extensive and were likely to be localised and restricted to former below ground structures;
- The Site Auditor found no evidence that construction activities undertaken at the PBR site had generated contamination;
- A cap would prevent uncontrolled direct contact with underlying contamination that remained at the Site;
- A cap would allow any soil vapours underlying the cap to be managed;
- The required end use of the PBR site was as a road construction worksite, which was not a sensitive land use compared to residential or open space parkland; and
- At the end of construction work the PBR site would remain capped by pavements, as described in **Section 3.9**.

A LTEMP needed to be prepared to manage the risk of residual contamination remaining at unknown pits within the PBR site, which is further discussed in **Section 3.10**.

3.5.2 Removal of Buried Services

ASBJV[47] drawings showed that buried services remained on the property boundaries, with copies provided in **Figure 3-5**. These services included water, sewer and gas. All services remained in-situ and had not been disturbed due to their location on the boundary of site. As such investigations into whether these assets contained asbestos or other hazardous materials was not required.

The Site Auditor considered the approach adopted by the ASBJV environment team to manage potential contamination associated with buried services at the PBR site met the requirements of their contract, the planning consent and EPL, as described in **Section 1.2.1**. The Site Auditor considered that contamination risks associated with unknown buried services remaining at the Site could be managed by an LTEMP.

A LTEMP needed to be prepared to manage the risk of residual contamination associated with buried services within the PBR site, which is further discussed in **Section 3.10**.

3.6 Construction Activities at Site

3.6.1 Management of Contaminated Soils

Documentation provided by ASBJV showed that following the completion of demolition and UST removal work, construction activities at the PBR site commenced involving:

- Construction of a decline to provide access to the tunnel;
- Cut to fill across the Site to achieve finished surface levels (**FSLs**), as shown in **Figure 3-8**;
- Relocation of Bignell Lane;
- Construction of a thick reinforced concrete ground slab in sections that covered the Site (**Figure 3-9**);
- Establishment of a large stockpile area (capacity 6,000 m^3) used to temporarily store tunnel spoil prior to being trucked off-site;
- Construction of a large warehouse structure to enclose the tunnel spoil stockpile and trucking operation;
- Construction of tunnel ventilation, a water treatment plant, switchyard, offices, workshops and laydown areas.

The layout of these construction facilities is provided in **Figure 1-5**, with a photo of the PBR site taken on 17/04/19 provided in **Figure 3-10**.

[47] Comment 3, Ref [5]

Figure 3-8 ASBJV Cut to Fill Plan for PBR Site (Source: Comment 13, Ref [6])

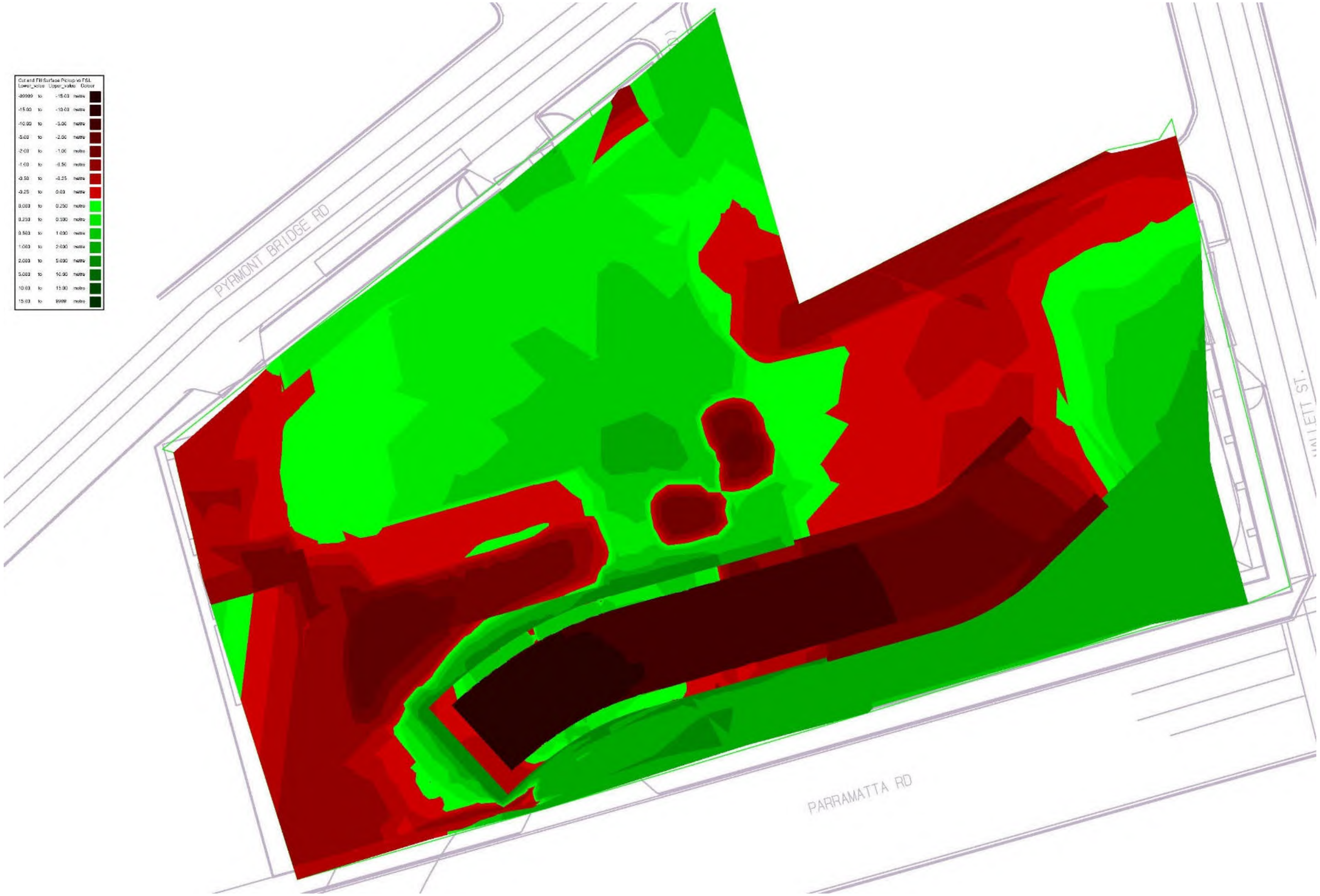


Figure 3-9 ASBJV Schedule of Concrete Ground Slab Pours Across PBR Site (Source: Comment 13, Ref [6])

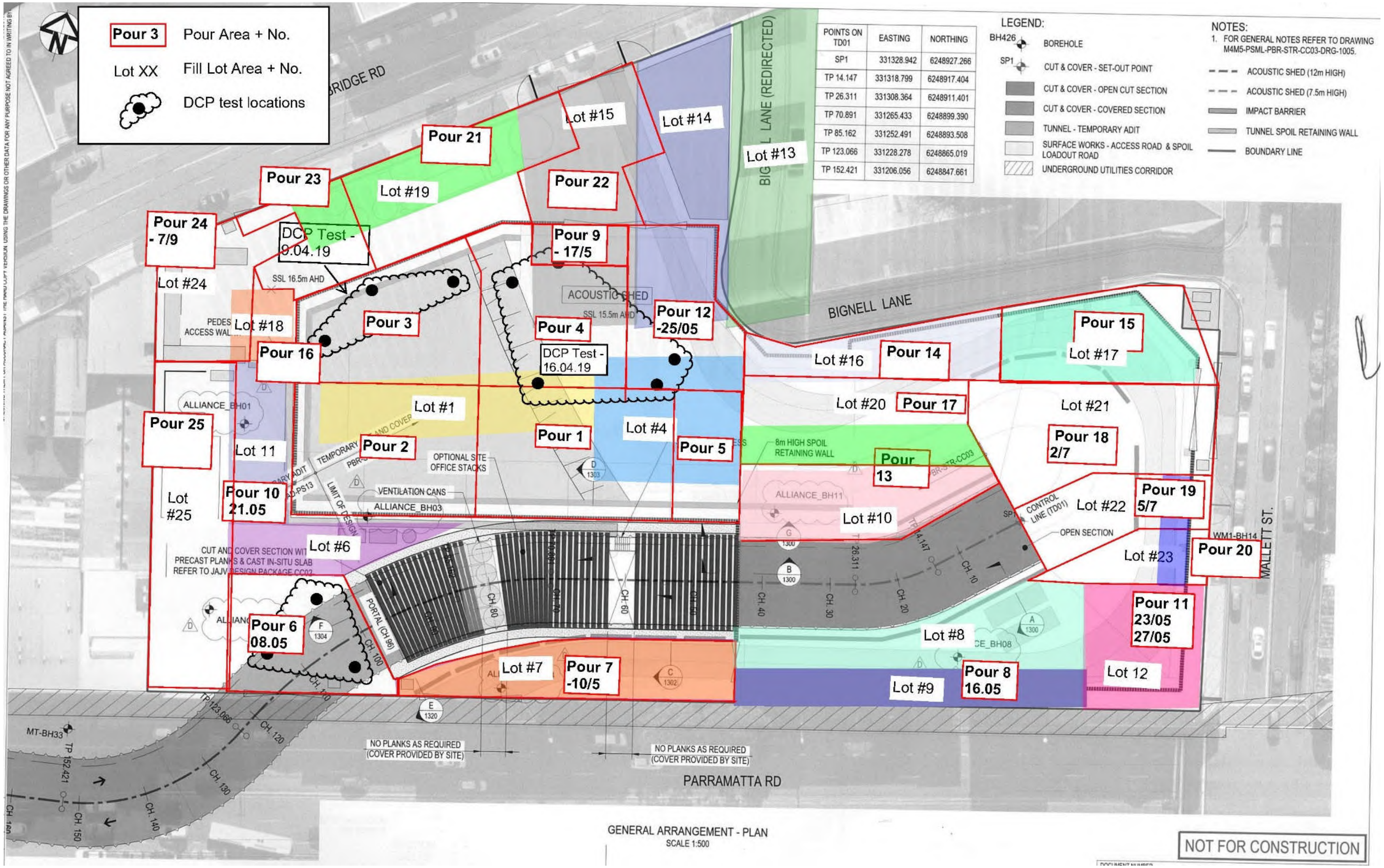


Figure 3-10 ASBJV Photo of Construction Activities at PBR Site on 17/04/19 (Source: Comment 13, Ref [6])

Figure 3-11 Aerial Views of PBR Site included in WCRs March – July 2019 (page 1 of 4)

25/03/19 Alliance WCR #8272-ER-1-2 RevB

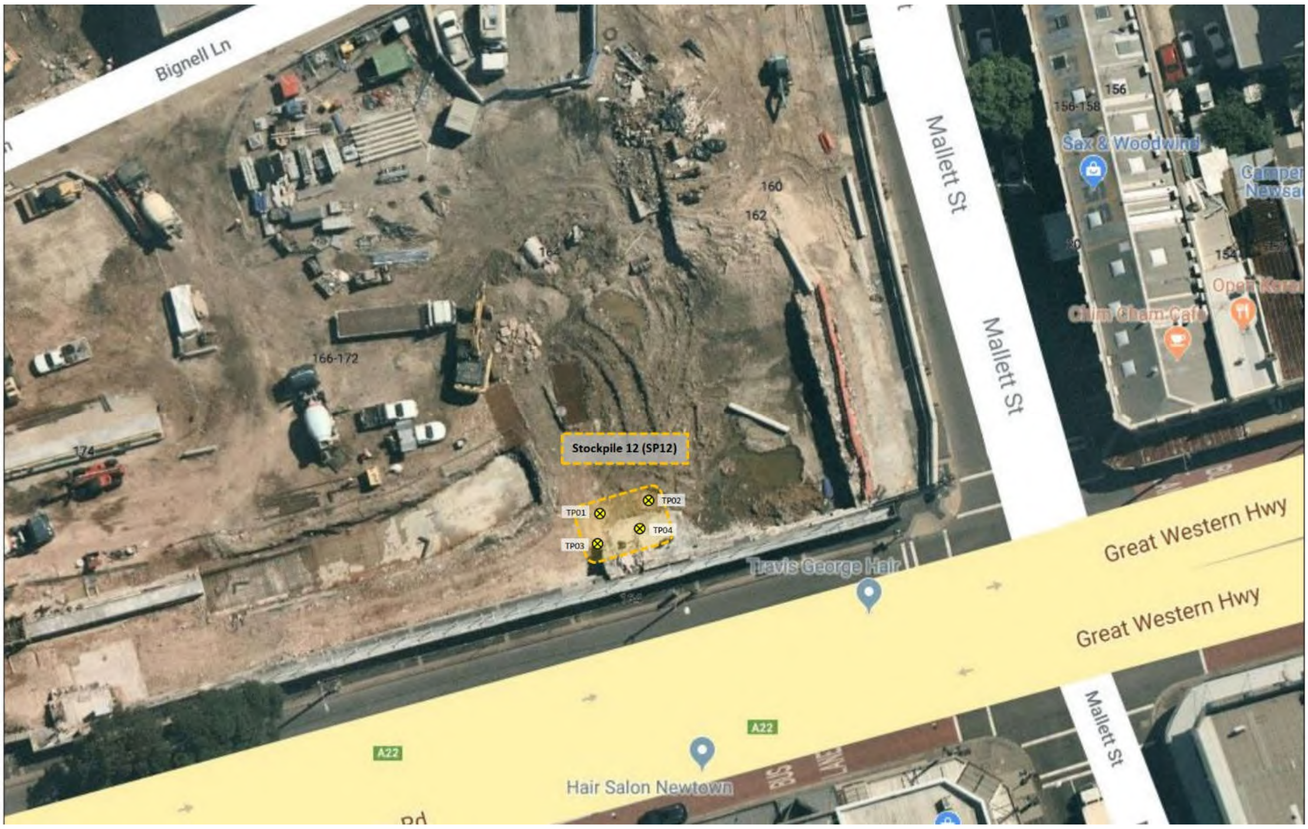
25/03/19 Alliance WCR #8272-ER-1-5

Figure 3-11 Aerial Views of PBR Site included in WCRs March – July 2019 (page 2 of 4)

9/04/19 Alliance WCR #8272-ER-1-9

9/04/19 Alliance WCR #8272-ER-1-11

Figure 3-11 Aerial Views of PBR Site included in WCRs March – July 2019 (page 3 of 4)



12/04/19 Alliance WCR #8272-ER-1-13

24/04/19 Alliance WCR #8272-ER-1-15

Figure 3-11 Aerial Views of PBR Site included in WCRs March – July 2019 (page 4 of 4)

16/05/19 Alliance WCR #8272-ER-1-16

9/07/19 Alliance WCR #8272-ER-1-24

The Site Auditor obtained an indication of how ASBJV managed contaminated soil during excavation work at the Site from a study of aerial photos provided in WCRs prepared by environmental consultants between March and July 2019, with a copy of these photos provided in **Figure 3-11**. The Site Auditor considered the aerial photos showed that soils were likely to have been selectively excavated, stockpiled and managed in an organised manner consistent with the requirements of the CLMP.

For cut areas, ASBJV[48] advised that materials were selectively excavated to prevent cross-contamination. Contaminated soils were classified and disposed according to their type. The tunnel decline was the only area where Virgin Excavated Natural Material (**VENM**) or Excavated Natural Material (**ENM**) was extracted from the PBR site, as this was the only area where the excavation extended below contaminated fill.

For fill areas, ASBJV advised that:

- VENM was typically used across the Site to bring levels to the adopted Finish Surface Level (**FSL**) due to the unsuitable nature of fill excavated from cut areas
- Some recycled material from the SPI site was used, comprising:
  - Layer 1 & 2 (First 600mm of fill from natural) – Pour 1 (**Figure 3-9**);
  - Layer 1 (First 300mm of fill from natural) – Pour 2 (**Figure 3-9**); and
  - Basement at Storage King in the SE corner of the Site.
- The Storage King basement (Property 8 in SE corner) was backfilled with a layer of reclaimed oversized from the site (Drainage layer) 500mm with 20mm stone imported from Concrete Recyclers. A 300 mm thick layer of on-site soil was then encapsulated by wrapping in geofabric as shown in **Figure 3-12.** The final backfill layers were sourced from on-site fill.

Figure 3-12 Backfilling of Storage King Basement in SE Corner of PBR Site

(Source: Comment 13, Ref [6])

[48] Comment 13, Ref [6]

ASBJV also advised that some contaminated soils classified as Restricted Solid Waste (**RSW**) was also used to backfill areas at the Site. An example was the tracking of a RSW stockpile between 30/01/19 and 27/02/19 as described:

- 30.01.19 – Unsuitable material discovered south of Bignell Lane, located around UST and RSW Stockpile #1. This stockpile was kept to the side and wrapped in geofabric;
- 12.02.19 – Unsuitable material discovered in Unexpected Find (Grease Trap) added to RSW Stockpile #1;
- 15.02.19 – USTs 1,2,3 & 4 removed and unsuitable material added to RSW Stockpile #1;
- 16.02.19 – Excavated A2 (storage king basement) back too natural and stockpiled unsuitable material adjacent to area (Stockpile #2);
- 20.02.19 – Area A1 filled with 300mm layer of RSW material and wrapped in geofabric;
- 21.02.19 – Area A2 filled with 200mm layer of RSW material. Placed on top of drainage layer and walls of basement wrapped in geofabric; and
- 27.02.19 – RSW Stockpile #1 moved to Stockpile Location #2. Excavated any unsuitable material that existed below Stockpile #1.

A sketch map showing the tracking of this RSW material is provided in **Figure 3-13**.

The Site Auditor considered that the ASBJV description of how soils were excavated and managed at the Site indicated that some contaminated fill was used as backfill and remained at the PBR site, and that some of this soil was contaminated at concentrations exceeding commercial/industrial D criteria.

Despite this, the Site Auditor considered the approach adopted by the ASBJV environment team to manage this contamination at the PBR site met the requirements of their contract, the planning consent and EPL, as described in **Section 1.2.1**. This is because the weight of evidence indicated that:

- ASBJV only disturbed contaminated soil required to allow the construction of facilities at the PBR site and that some of this soil was backfilled and compacted in cells located on-site;
- There was a low risk that construction work undertaken by ASBJV at the Site generated contamination;
- The PBR site was capable of being returned to a condition suitable as a road construction worksite if it was capped and managed by a LTEMP; and
- The requirements of the EPL did affect the management of soil contamination at the Site.

The Site Auditor considered the risks posed by contaminated soil remaining in cells at the PBR site were capable of being addressed by capping the Site and managing the residual contamination by means of a LTEMP for the reasons given in **Section 3.4.4**. A LTEMP needed to be prepared to manage the risk of residual soil contamination remaining within the PBR site, which is further discussed in **Section 3.10**.

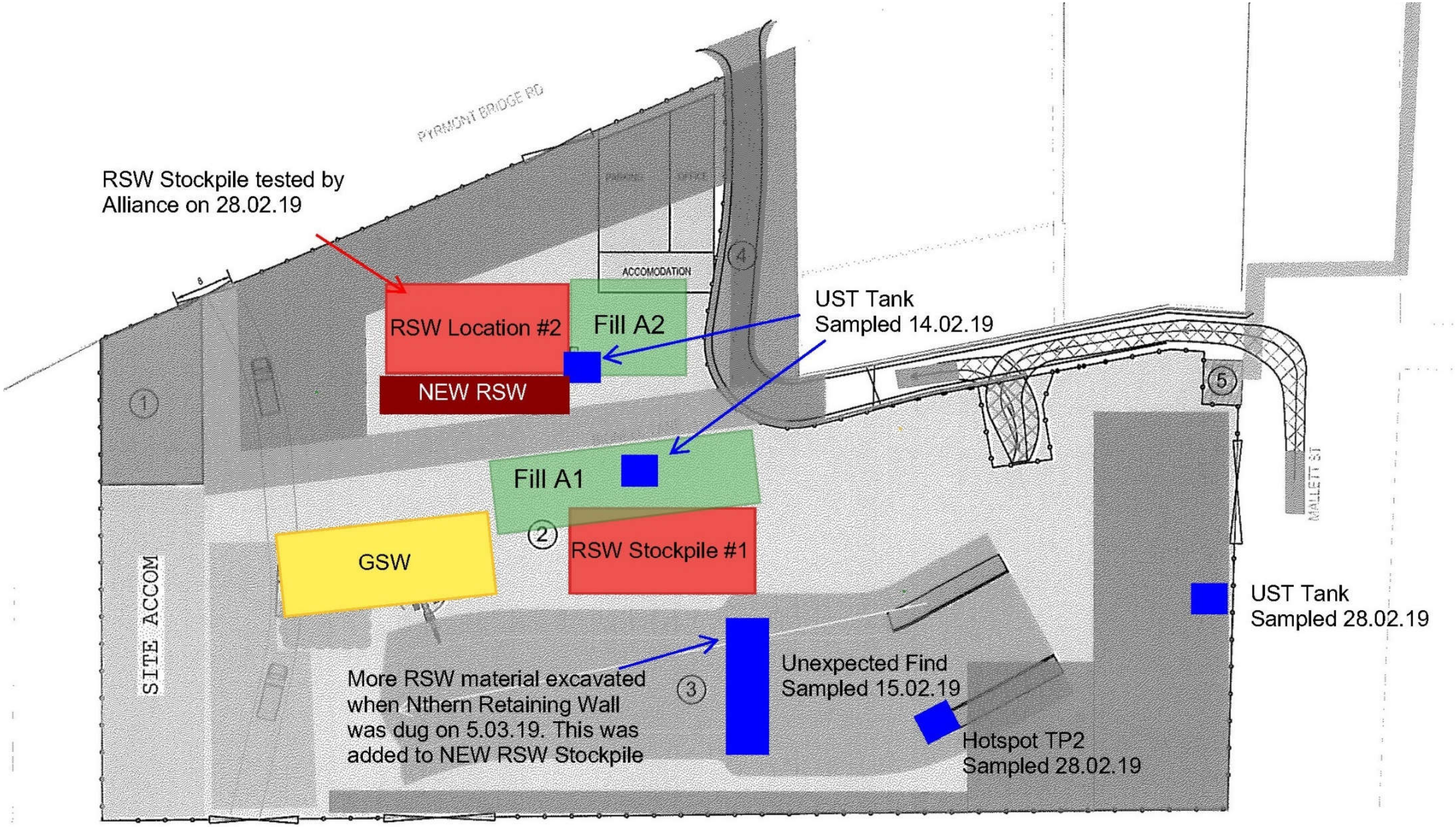
3.6.1 Stockpiling of Excavated Material

The Site Auditor considered there was a low risk of site contamination from material stockpiling on-site because:

- The CLMP[49] required stockpiles to be managed in accordance with the RMS (2011) '*Stockpile Site Management Guideline*'. The CLMP required suitable areas to be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas were considered to be hardstand or lined areas that were appropriately stabilised and bunded, with sufficient area for stockpile storage. These areas were to be inspected regularly to ensure effective contamination management. The superintendent, foreman and all project personnel were made responsible for stockpile management;

[49] Sections 2.1.3, 2.3 & 6, Ref [54]

Figure 3-13 ASBJV Tracking of RSW Stockpile in February 2019 (Source: Comment 13, Ref [6])



- Photos provided by environmental consultants in the WCRs indicated that excavated soils removed from the PBR site were temporarily placed into on-site stockpiles. The stockpiles were formed in portioned areas formed by New Jersey barriers, with geofabric placed over stockpiles containing asbestos contaminated soil. Example of these photos are provided in **Figure 3-14**; and
- All stockpiles had been removed from the Site and the Site sealed by concrete pavement when the Site Auditor inspected the PBS site of 2/06/21.

Figure 3-14 Photos of Stockpiles at PBR Site by Enviro Consultants (Source: Comment 13, Ref [6])

3.6.2 Asbestos Clearances

ASBJV provided copies of six asbestos clearance reports for the PBR site. The reports were prepared for visible asbestos found during bulk earthworks and were not associated with demolition work that was undertaken prior to the commencement of earthworks.

The parts of the PBR site that the clearance reports covered were:

1. Airsafe 5/02/19: Asbestos fragment at a location along Bignell Lane

Photo 1

Approx location of fragment on soil surface prior to removal .

Photo 1

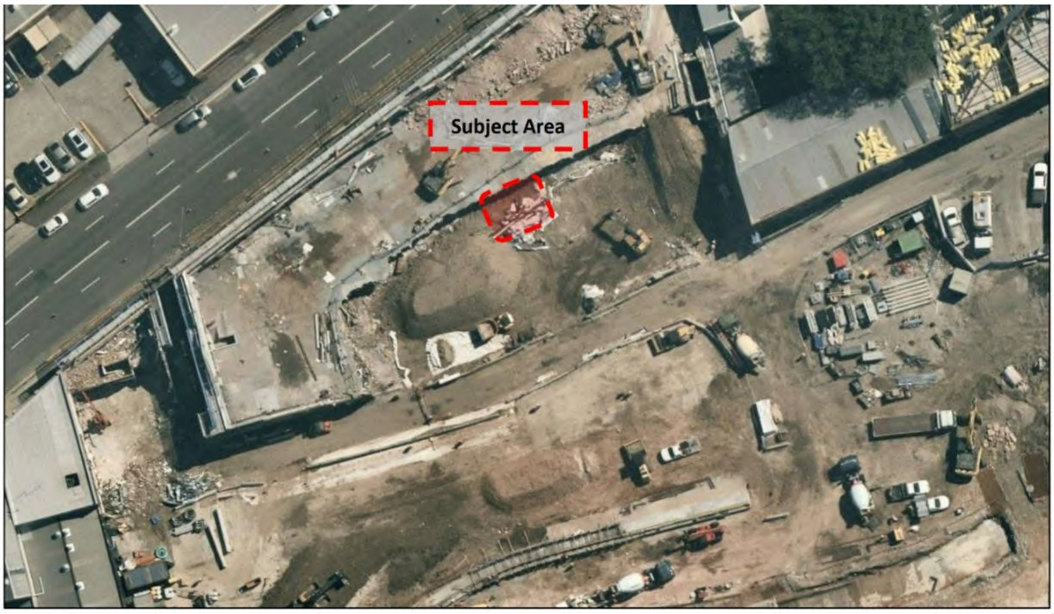
After the removal of fragment from soil surface .

2. Airsafe 19/03/19: Clearance inspection of visible asbestos fragments at 95 Pyrmont Bridge Road

Photo 1

Location of unexpected finds.

3. Alliance Geotechnical 15/04/19: Clearance inspection of stockpile footprint following removal of bonded asbestos contaminated soil stockpile from 79 Pyrmont Bridge Road. Clearance location shown in aerial photo below.



Aerial Photograph 1. Approximate location of the subject area following the removal of non-friable (bonded)

4. Alliance Geotechnical 15/04/19: Clearance inspections of excavated Area A and Area B in Stage 2 part of Site as shown in aerial photo below (Note: No asbestos clearance inspection performed for Area C).

Aerial Photograph 1. Approximate location of the subject areas including sampling locations

5. JM Environments: The 4,000 t of friable asbestos soil was reported as removed from 179 Parramatta Road (no aerial photo provided).
6. JM Environments: Clearance inspections of stockpile footprints following removal of two stockpiles of asbestos contaminated soil at the locations shown in aerial photo below.

A summary of the six asbestos clearance reports is provided in **Table 3-3**.

Table 3-3 Summary of Asbestos Clearance Reports (Source: Ref [6])

Certificate Date	Occupational Hygienist	Site Address	Results of Clearance Inspection
15/02/2019	Airsafe	Bignell Lane, Annandale	The asbestos material was safely removed in accordance with Safe Work Australia 2018 Code and the asbestos removal area and the area immediately surrounding it were free from visible asbestos contamination
19/03/2019	Airsafe	95 Pyrmont Bridge Road, Annandale	The asbestos material was safely removed in accordance with Safe Work Australia 2018 Code and the asbestos removal area and the area immediately surrounding it are free from visible asbestos contamination
15/04/2019	Alliance Geotechnical	79 Pyrmont Bridge Road, Annandale	• Visual examination found the stockpile containing non-friable (bonded) ACMs had been removed to a satisfactory standard • Airborne asbestos monitoring measured airborne asbestos fibres were below the detection limit of the method (<0.01 fibres/mL) • The area was considered safe with regards to the asbestos hazard at the time of the visual inspection
15/04/2019	Alliance Geotechnical	79 Pyrmont Bridge Road, Annandale	• Visual examination of areas A and B found asbestos contaminated soil had been removed to a satisfactory standard • Validation samples taken from areas A and B did not detect asbestos in 10 soil samples tested • Airborne asbestos monitoring measured airborne asbestos fibres were below the detection limit of the method (<0.01 fibres/mL) • Areas A & B were considered safe with regards to the asbestos hazard at the time of the visual inspection
			• Area C (not included in the scope of this clearance certificate) contained friable asbestos containing soil. Access to this stockpile needed to remain restricted and geofabric covering needed to be maintained
29/04/2019	JM Environments	179 Parramatta Road, Annandale	4,000 t of friable asbestos soil was removed from a stockpile at 179 Parramatta Road. No visible asbestos was found in the stockpile footprint. Air monitoring measured asbestos fibres <0.01 f/mL
9/05/2019	JM Environments	79 Pyrmont Bridge Road, Annandale	Two stockpiles of asbestos contaminated soil were removed by Access Quality Services & clearance inspections were undertaken 2-3/05/19. No visible asbestos was found in the stockpile footprints. Air monitoring measured asbestos fibres <0.01 f/mL

The Site Auditor identified some errors and data gaps in the asbestos clearance reports listed in **Table 3-3**, these being:

- The two asbestos clearance reports prepared by Alliance Geotechnical did not mention the licensed asbestos removalist who undertook the work
- None of the asbestos clearance reports covered Area C that contained friable asbestos containing soil mentioned in the Alliance Geotechnical report (15/04/19) report (No: 8272-ER-2-2)
- The JM Environments (29/04/19) asbestos clearance report provided:
  - No information of the licensed asbestos removalist who removed 4,000 t of friable asbestos soil from the Site;
  - No plan showing where the friable asbestos contaminated soil was located; and
  - A table of asbestos fibre air monitoring results without providing a copy of the laboratory test certificate.

The Site Auditor considered that the errors and data gaps in the asbestos clearance reports did not increase asbestos contamination risks at the PBR site because:

- The waste tracking data indicated that a large volume of asbestos contaminated soil was removed from the Site, as reviewed in **Section 3.7**;
- Data gaps in documentation did not affect the conclusion that construction activities undertaken by ASBJV resulted in a significant reduction in the volume of asbestos contaminated soil remaining at the Site;
- The Site was capped by a thick concrete ground slab; and
- The risks posed by asbestos contaminated soils remaining at the Site could be addressed by managing the Site in accordance with a LTEMP, which is reviewed in **Section 3.10**.

3.6.3 Unexpected Finds

ASBJV[50] provided an Unexpected Finds register that recorded seven unexpected finds during construction activities at the PBR site, with a summary provided in **Table 3-4**.

Table 3-4 Unexpected Finds made at PBR Site

UF #	Date	Contaminant	Date of UF record	UFP Intitiated	Notes
1	24/01/2019	Asbestos in undisturbed soil	**Not provided**	Yes	Asbestos clearance performed
2	7/02/2019	Petroleum hydrocarbons	**Not provided**	Yes	Removal completed
6	14/03/2019	Asbestos in undisturbed soil	**Not provided**	Yes	Asbestos clearance performed
7	22/03/2019	Asbestos in stockpiled soil	**Not provided**	Yes	Asbestos clearance performed & stockpiled under asbestos management protocols
9	10/04/2019	UST	**Not provided**	Yes	UST removed and certificate of destruction received
10	12/04/2019	Friable asbestos in stockpiled soil	**Not provided**	Yes	Asbestos clearance certificate received from source location
11	17/04/2019	Bonded asbestos in undisturbed soil	**Not provided**	**Not provided**	Material left in-situ and protected

[50] Comment 12, Ref [6]

While some other documentation was missing[51], the Site Auditor considered the documentation provided by ASBJV indicated that unexpected finds were likely to have been properly managed and helped to keep construction activities at the PBR site from posing a site contamination risk. This is because:

- An Unexpected Finds Register was kept by the Project;
- ASBJV held toolbox training talks on the Unexpected Finds Procedure, as indicated by a copy of a toolbox attendance record dated 13/02/19[52];
- ASBJV had an environmental professional manage environmental issues at each worksite;
- The Site Auditor found the various worksites well managed and organised, as shown by the photos in **Appendix D**; and
- The Site Auditor found no physical evidence of contamination remaining at the ground surface at any of the sites audited following the completion of earthworks.

3.6.4 Environmental Management and Incidents

The Site Auditor considered that the weight of evidence indicated that environmental conditions at the PBR site were likely to have been well managed and there was a low risk of environmental incidents having occurred that posed a contamination risk to the suitability of the Site for its intended road construction worksite land use. This is because:

- Construction activities at the Site were required to follow detailed environmental management plans that had been approved by independent environmental auditors and regulatory authorities;
- An extensive arrays of management plans and on-site training occurred as evidenced by the documentation provided to the Site Auditor for review and the protocols that the Site Auditor needed to follow when inspecting the Project site;
- Construction activities at the Site were well managed by site personnel and the Site Auditor found no evidence of poor environmental management practices when inspecting the Site, as shown by photos provided in **Appendix D**;
- Two annual reports that ASBJV issued to the EPA for the periods October 18-19 and October 19-20 recorded no significant environmental incidents;
- The Site was sealed by thick concrete slabs and most of the Site was covered by an enclosure that would have reduced risks posed by spills, leaks, accidents, etc;
- Construction activities at the Site did not involve the bulk storage of large quantities of fuel or chemicals, with tanks and chemicals used by the wastewater treatment plant contained within bunds; and
- The Site Auditor received no complaints from regulatory authorities regarding construction activities that occurred at the Site during the period of the site audit.

3.6.5 Groundwater Treatment

A wastewater treatment plant operated at the PBR site, which treated groundwater that seeped into the tunnel and water that was used in the tunnel as part of construction activities. Groundwater that was present at the PBR site was also likely to have been removed and treated by the plant because much of the PBR site was taken up by the tunnel decline, as shown in **Figure 1-5**.

Operation of the wastewater treatment plant was subject to compliance with conditions in the EPL 21149. This included monitoring of the treated water quality prior to discharge. Monitoring records provided by ASBJV[53] indicated that:

- The records were for the period 19/03/19 to 28/10/22;

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[51] e.g. Unexpected Find Daily Field Record Sheet, follow up date on the management of some Unexpected Finds

[52] Comment 16, Ref [6]

[53] Comment 16, Ref [6]

- A total of 138 monitoring samples were collected and tested over this period;
- Each sample was tested for turbidity, total suspended solids (**TSS**), pH, oil & grease, ammonia and heavy metals (arsenic, cadmium, chromium (VI), chromium (III), copper, iron, lead, manganese, mercury, nickel zinc); and
- Practically all samples complied with the discharge criteria. Minor non-compliances were measured for copper (1), zinc (4), ammonia (1), TSS (2).

The Site Auditor considered the results of the monitoring program indicated that the wastewater treatment plant at the PBR site was well operated, treated a large volume of groundwater removed from the PBR site and tunnel, and practically complied with EPL requirements.

3.6.6 Potential for Construction Activities to Have Contaminated the Site

The Site Auditor considered the weight of evidence supported the conclusion that:

- ASBJV managed contamination at the PBR site that ASBJV interfered or disturbed during the course of carrying out its work on the WestConnex Stage 3A project;
- Contamination was not generated by construction activities undertaken at the PBR site; and
- Contamination was not generated at the PBR site that caused an increase in contamination migrating from the Project site.

This is because:

- Soils appeared to have been selectively excavated, stockpiled and managed in an organised manner consistent with the requirements of the CLMP for the reasons given in **Section 3.6.1**;
- There was a low risk of site contamination from material stockpiling on-site for the reasons given in **Section 3.6.2**;
- The errors and data gaps in the asbestos clearance reports did not increase asbestos contamination risks at the PBR site for the reasons given in **Section 3.6.3**;
- Unexpected finds were likely to have been properly managed and helped to keep construction activities at the PBR site from posing a site contamination risk for the reasons given in **Section 3.6.4**;
- Environmental conditions at the PBR site were likely to have been well managed and there was a low risk of environmental incidents having occurred that posed a contamination risk to the suitability of the Site for its intended road construction worksite land use for the reasons given in **Section 3.6.5**;
- While some contaminated fill was used to backfill the PBR site, possibly at concentrations exceeding commercial/industrial D criteria, the amount of contamination that remained at the Site was significantly reduced because of the large volume of contaminated soil removed from the Site as shown by the data reviewed in **Section 3.7**; and
- The Site Auditor found no physical evidence of contaminated soils or chemicals remaining at the Site at the end of the project.

3.7 Waste Classification and Management

3.7.1 Classification of Excavated Contaminated Soils

ASBJV[54] provided eleven WCRs for contaminated soils reported to have been excavated as part of construction work and disposed off-site. A summary of data provided by the reports is provided in **Table 3-5**.

[54] ASBJV 7/10/21 email

Table 3-5 Summary of WCRs Provided by ASBJV

WCR Date	WCR Number	Enviro Consultant	Waste Location	Waste Description	Sampling Date	Volume (m^3)	Number Samples Tested	Sample Frequency (per m^3)	Waste Classification	Exceedances of HIL D (1)
11/02/2019	8272-ER-1-1	Alliance	Test pit located in western Stage 2 area	Ponded water in test pit	8/02/2019	8	1	8	Liquid waste	Not relevant
20/03/2019	8272-ER-1-2	Alliance	Stockpile 02 in bunded area at 79 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic)	28/02/2019	400	4	100	GSW	None
25/03/2019	8272-ER-1-2-RevB (2)	Alliance	Stockpile 02 in bunded area at 79 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic)	21/03/2010	600	7	86	Special waste - asbestos non-friable GSW	Asbestos present
25/03/2019	8272-ER-1-5	Alliance	Stockpile 05 in central part of PBR site	Gravelly clay with sand & C&D waste (concrete, bricks)	21/03/2019	210	3	70	GSW	None
2/04/2019	JME18057-59	JM Environments	Stockpile located at 73 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic, etc)	29/03/2019	22.5	8	2.8	GSW	None
9/04/2019	8272-ER-1-9	Alliance	Stockpile 09 in SE corner of 79 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic)	5/04/2019	990	5	198	GSW	None
9/04/2019	8272-ER-1-11	Alliance	Stockpile 11 in eastern part of Stage 2 area	Clay with C&D waste (concrete, bricks, plastic)	5/04/2019	480	4	120	GSW	None
12/04/2019	8272-ER-1-13	Alliance	Stockpile 12 in eastern part of Stage 2 area	Sandy clay, darkly stained & hydrocarbon odour with C&D waste (concrete, bricks, plastic)	9/04/2019	450	4	113	Special waste - asbestos friable GSW	Asbestos present
24/04/2019	8272-ER-1-15	Alliance	Stockpile 15 in SE corner of 79 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic)	18/04/2019	1500	7	214	GSW	None
6/05/2019	JME18057-71	JM Environments	Insitu waste classification at 73 PBR	Gravelly clay with C&D waste (concrete, bricks, plastic)	26/04/2019	375	10	37.5	RSW	One sample measured lead at 3,800 mg/kg (HIL 1,500 mg/kg)
16/05/2019	8272-ER-1-16	Alliance	Stockpile 16 on northern side of 79 PBR	Sandy clay with C&D waste (concrete, bricks, plastic)	14/04/2019	1100	5	220	GSW	None
9/07/2019	8272-ER-1-24	Alliance	Insitu waste classification for proposed weighbridge excav-ation at SE corner of 79 PBR	Mix of sand & sandstone gravel with gravelly clay & C&D waste (concrete, charcoal)	5/07/2019	160	6	26.7	GSW	None
			Totals for soils (excluding 8272-ER-1-2 quantity)			**5888**	**59**	**100**		

Notes:
(1) Assumed unit weight of stockpiled soil 1.6 t/m^3
(2) Superseded Alliance 8272-ER-1-2 WCR dated 20/03/19

[yellow] Exceedance of HIL D

The Site Auditor considered the weight of evidence supported the conclusion that the WCRs prepared for excavated soils removed from the Site generally met EPA guidance because each report included most of documentation required by the EPA[55], this being:

- The full name, address, Australian Company Number (ACN) or Australian Business Number (ABN) of the organisation and person(s) providing the waste classification;
- Location of the site where the waste was generated, including the site address;
- History of the material and the processes and activities that had taken place to produce the waste;
- Potential contaminating activities that may have occurred at the site where the waste was generated;
- Description of the waste, including photographs, visible signs of contamination, such as discolouration, staining, odours, etc;
- Quantity of the waste;
- Number of samples collected and analysed;
- Sampling method including pattern, depth, locations, sampling devices, procedures, and photos of the sample locations and samples;
- Contaminants tested;
- Laboratory documentation – chain-of-custody, sample receipt, laboratory report;
- All results regardless of whether they are not used in the classification process;
- Brief summary of findings including discussion of results, exceedances of the relevant contaminant threshold (CT) or specific contaminant concentration (SCC) and toxicity characteristics leaching procedure (TCLP) threshold values; and
- A clear statement of the classification of the waste as at the time of the report.

The Site Auditor identified three data gaps in the WCRs provided by ASBJV for this SAR.

The first gap was the absence of statistical analyses that gave the sample mean, sample standard deviation and the 95 percent upper confidence limit (**UCL**) of the sample mean. The Site Auditor considered this data gap was not significant because the waste classification met or was close to meeting recommended sample frequencies and the waste classification was based on the highest concentrations measured.

The second data gap was that 12 WCRs referenced by the ASBJV waste tracking spreadsheet were not provided for this SAR. The missing WCRs were:

- Alliance WCR 8272-ER-1-7 for VENM;
- Alliance WCR 8272-ER-1-8 for Special Waste – Asbestos (GSW);
- Alliance WCR 8272-ER-1-12 for VENM;
- Alliance WCR 8272-ER-1-17 for GSW;
- Alliance WCR 8272-ER-1-18 for GSW;
- Alliance WCR 8272-ER-1-19 for GSW;
- Alliance WCR 8272-ER-1-27 for GSW;
- JM Environments WCR 18057-69 for GSW;
- JM Environments WCR 18057-70 for RSW;
- JM Environments WCR 18057-78 for GSW;
- JM Environments WCR 18057-80a for GSW; and

[55] EPA website https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste

- JM Environments WCR 18057-97 for GSW.

The third data gap concerned an explanation as to why 1,344 tonnes of soil from stockpile 2 were disposed as GSW between 26/03/19 and 28/03/19 using Alliance WCR #8272-ER-1-2, when this WCR was superseded by Alliance WCR #8272-ER-1-2 RevB dated 25/03/19, which classified stockpile 2 as Special Waste – asbestos (GSW).

The Site Auditor addressed second and third data gaps by issuing a Section B SAS that requested copies of the missing WCRs be provided for review by the Site Auditor together with an explanation regarding the waste disposed off-site between 26-28/03/19. This matter is further discussed in **Section 4**.

3.7.2 Waste Disposal Tracking System

The documentation provided by ASBJV[56] on excavated soils removed from PBR site consisted of a waste tracking spreadsheet. The data provided by the spreadsheet for each load of soil removed from the Site comprised:

- Date;
- Docket ID;
- Waste classification;
- Spoil description;
- WCR number;
- Weight (t);
- Haulage contractor;
- Truck licence plate number;
- Receiving waste facility name;
- Origin of Waste (i.e. PBR site); and
- Financial period.

A summary of the data provided by ASBJV is provided in **Table 3-6**.

[56] Comment 13, Ref [6]

Table 3-6 Summary of Waste Disposal Data Provided by ASBJV for the PBR Site (page 1 of 2)

			Amount of Waste							Documentation Provided	
Date	Receiving Waste Facility	EPA EPL	C&D Waste (t)	VENM (t)	GSW - high lead (t)	GSW - V2 (t)	Asbestos (t)	RSW (t)	Rejected Loads (t)	Waste Facility Docket	EPA Waste Tracking
22/03/2019	SCE Recycling, Port Kembla	1265				182.80				no	no
26/03/2019	Sydney Recycling Park, Kemps Creek	12901			234.00					no	no
27/03/2019	Sydney Recycling Park, Kemps Creek	12901			613.20					no	no
28/03/2019	Sydney Recycling Park, Kemps Creek	12901			497.00					no	no
29/03/2019	Sydney Recycling Park, Kemps Creek	12901			426.50					no	no
30/03/2019	Sydney Recycling Park, Kemps Creek	12901			191.50					no	no
2/04/2019	Sydney Recycling Park, Kemps Creek	12901			231.00					no	no
3/04/2019	Sydney Recycling Park, Kemps Creek	12901			310.00					no	no
4/04/2019	Sydney Recycling Park, Kemps Creek	12901			107.82					no	no
5/04/2019	Mamre Road, Orchard Hills	?		142.64						no	no
6/04/2019	Cawdor Road, Cawdor	?		284.60						no	no
8/04/2019	Mamre Road, Orchard Hills	?		476.80						no	no
11/04/2019	SCE Recycling, Port Kembla	1265				150.60				no	no
11/04/2019	SCE Recycling, Port Kembla	1265							8.00	no	no
12/04/2019	ECORR, Wetherill Park	?	35.00							no	no
13/04/2019	Mamre Road, Orchard Hills	?		147.80						no	no
13/04/2019	SCE Recycling, Port Kembla	1265				176.24				no	no
13/04/2019	SCE Recycling, Port Kembla	1265							4.00	no	no
15/04/2019	Mamre Road, Orchard Hills	?		136.80						no	no
15/04/2019	Glenfield Waste Services, Glenfield	4614					150.02			no	no
15/04/2019	SCE Recycling, Port Kembla	1265				59.32				no	no
16/04/2019	Benedict Recycling, Chipping Norton	12794				197.88				no	no
17/04/2019	Cleanaway, Kemps Creek	4068			704.90					no	no
23/04/2019	Mamre Road, Orchard Hills	?		450.20						no	no
23/04/2019	Cleanaway, Kemps Creek	4068			1232.41					no	no
24/04/2019	Cleanaway, Kemps Creek	4068			650.51					no	no
24/04/2019	Moorebank Intermodal, Moorebank	?		39.00						no	no
24/04/2019	Cleanaway, Kemps Creek	4068			117.52					no	no
26/04/2019	Wonderland Drive, Eastern Creek	?		703.86						no	no
26/04/2019	Cleanaway, Kemps Creek	4068			232.56					no	no
27/04/2019	Wonderland Drive, Eastern Creek	?		1072.78						no	no
29/04/2019	Wonderland Drive, Eastern Creek	?		1110.20						no	no
29/04/2019	Cleanaway, Kemps Creek	4068					364.30			no	no
1/05/2019	Mamre Road, Orchard Hills	?		373.40						no	no
2/05/2019	Mamre Road, Orchard Hills	?		804.38						no	no
2/05/2019	Cleanaway, Kemps Creek	4068					531.94			no	no
3/05/2019	Bringelly Road, Bringelly	?		285.30						no	no
3/05/2019	Moorebank Intermodal, Moorebank	?		193.30						no	no
3/05/2019	Cleanaway, Kemps Creek	4068					114.16			no	no
6/05/2019	Moorebank Intermodal, Moorebank	?		546.20						no	no
7/05/2019	Moorebank Intermodal, Moorebank	?		777.25						no	no
7/05/2019	Unknown	?				35.00				no	no
8/05/2019	Cleanaway, Kemps Creek	4068					149.84			no	no
9/05/2019	Concrete Recyclers, Camellia	6664	34.00							no	no
10/05/2019	SUEZ, Kemps Creek	12889						348.72		no	no
13/05/2019	SUEZ, Kemps Creek	12889						340.14		no	no
18/05/2019	Concrete Recyclers, Camellia	6664	38.00							no	no
18/05/2019	Rail Bypass Project, Albion Park	?				39.00				no	no
21/05/2019	Rail Bypass Project, Albion Park	?				881.50				no	no
22/05/2019	Rail Bypass Project, Albion Park	?				193.30				no	no
22/05/2019	Concrete Recyclers, Camellia	6664	35.00							no	no
23/05/2019	Rail Bypass Project, Albion Park	?				38.20				no	no
29/05/2019	Rail Bypass Project, Albion Park	?				614.30				no	no
30/05/2019	Rail Bypass Project, Albion Park	?				538.70				no	no
31/05/2019	Rail Bypass Project, Albion Park	?				766.60				no	no
1/06/2019	Rail Bypass Project, Albion Park	?				421.20				no	no
7/06/2019	Rail Bypass Project, Albion Park	?				110.00				no	no
12/06/2019	Rail Bypass Project, Albion Park	?				229.00				no	no
13/06/2019	Rail Bypass Project, Albion Park	?				494.50				no	no
14/06/2019	Rail Bypass Project, Albion Park	?				416.10				no	no
19/06/2019	Rail Bypass Project, Albion Park	?				375.70				no	no

Table 3-6 Summary of Waste Disposal Data Provided by ASBJV (page 2 of 2)

			Amount of Waste							Documentation Provided	
Date	Receiving Waste Facility	EPA EPL	C&D Waste (t)	VENM (t)	GSW - high lead (t)	GSW - V2 (t)	Asbestos (t)	RSW (t)	Rejected Loads (t)	Waste Facility Docket	EPA Waste Tracking
21/06/2019	Rail Bypass Project, Albion Park	?				155.20				no	no
2/07/2019	Rail Bypass Project, Albion Park	?				228.15				no	no
3/07/2019	Rail Bypass Project, Albion Park	?				186.45				no	no
9/07/2019	Rail Bypass Project, Albion Park	?				267.50				no	no
10/07/2019	Rail Bypass Project, Albion Park	?				154.00				no	no
11/07/2019	Rail Bypass Project, Albion Park	?				307.70				no	no
12/07/2019	Rail Bypass Project, Albion Park	?				339.70				no	no
13/07/2019	Rail Bypass Project, Albion Park	?				649.80				no	no
15/07/2019	Rail Bypass Project, Albion Park	?				114.70				no	no
16/07/2019	Rail Bypass Project, Albion Park	?	79.18							no	no
17/07/2019	Bluescope Steelworks, Port Kembla	397, 571,				145.22				no	no
19/07/2019	Rail Bypass Project, Albion Park	?				381.70				no	no
22/07/2019	Rail Bypass Project, Albion Park	?				305.80				no	no
23/07/2019	Rail Bypass Project, Albion Park	?				192.20				no	no
23/07/2019	Concrete Recyclers, Camellia	6664	11.20							no	no
23/07/2019	Sustainable Resource Centre, Fairfield	5713	35.26							no	no
26/07/2019	Rail Bypass Project, Albion Park	?				153.80				no	no
27/07/2019	Rail Bypass Project, Albion Park	?				73.50				no	no
30/07/2019	Rail Bypass Project, Albion Park	?				149.80				no	no
31/07/2019	Rail Bypass Project, Albion Park	?				114.50				no	no
9/08/2019	Rail Bypass Project, Albion Park	?				111.10				no	no
12/08/2019	Rail Bypass Project, Albion Park	?				152.10				no	no
15/08/2019	Rail Bypass Project, Albion Park	?				455.70				no	no
15/08/2019	Concrete Recyclers, Camellia	6664	34.00							no	no
19/08/2019	Rail Bypass Project, Albion Park	?				38.50				no	no
19/08/2019	ECORR, Wetherill Park	?	10.00							no	
3/09/2019	Rail Bypass Project, Albion Park	?				149.75				no	no
3/09/2019	Concrete Recyclers, Camellia	6664	38.00							no	no
6/09/2019	Concrete Recyclers, Camellia	6664	31.00							no	no
15/10/2019	Concrete Recyclers, Camellia	6664	141.60							no	no
18/10/2019	Rail Bypass Project, Albion Park	?				449.35				no	no
21/10/2019	Rail Bypass Project, Albion Park	?				38.90				no	no
		TOTAL	**522**	**7545**	**5549**	**11235**	**1310**	**689**	**12**		

The Site Auditor considered that the waste disposal spreadsheet was a robust approach to tracking the movement of excavated soil waste from the PBR site.

The data provided by the waste disposal spreadsheet showed that:

- 26,862 t of excavated soil was exported from the PBR site;
- 62.5% of the disposed soil was classified as GSW;
- 4.9% of the disposed soil was classified as asbestos waste;
- 2.6 % of the disposed soil was classified as RSW; and
- 0.04% of the disposed soil was rejected at the receiving facility.

3.7.3 Data Gaps in Waste Disposal Records

The documentation provided by ASBJV did not include the EPL numbers for the facilities that received waste from the PBR site. The Site Auditor partially addressed this data gap by obtaining the EPL numbers for those facilities listed in EPA records.

Other data gaps identified by the Site Auditor regarding waste disposal records that needed to be addressed comprised:

- Copies of waste facility receipts were not provided verifying that soils removed from Site had been received by a waste facility that could lawfully receive the soil
- No EPA waste tracking records were provided for asbestos contaminated soil removed from Site
- No documentation was provided showing that land that received material classified as VENM had a consent from the appropriate regulatory authority to receive that waste for its waste activities. These locations included:
    - Mamre Road, Orchard Hills and Erskine Park;
    - Cawdor Road, Cawdor;
    - Moorebank Intermodal, Moorebank;
    - Wonderland Drive, Eastern Creek; and
    - Bringelly Road, Bringelly.
- No documentation was provided showing that the Rail Bypass Project, Albion Park, was licensed to receive GSW
- The EPL for ECORR at Wetherill Park, which was recorded as receiving C&D waste
- Information on the four trucks of material classified as GSW that was taken to SCE Recycling, Port Kembla, on 11/04/19 and 13/04/19 and rejected.

The Site Auditor addressed these data gaps by issuing a Section B SAS that requested:

- Copies of waste disposal receipts be provided for not less than 10% of waste removed from the Site;
- EPA waste tracking dockets for asbestos contaminated soil;
- Documentation showing that land that received material classified as VENM had a consent from the appropriate regulatory authority to receive that waste for its waste activities;
- A copy of the EPL for the Rail Bypass Project and ECORR Wetherill Park showing the types of materials these sites could lawfully receive; and
- Information on the four trucks of material classified as GSW that was taken to SCE Recycling, Port Kembla, on 11/04/19 and 13/04/19 and rejected.

This matter is further discussed in **Section 4**.

3.8 Imported Fill

ASBJV[57] advised that some recycled material from the SPI site was imported to the PBR site as part of the earthworks program in 2019.

At the end of tunnelling work, the decline that occupied a large part of the PBR site needed to be backfilled with a large amount of soil that was to be geotechnically and environmentally acceptable. The design of the tunnel backfill at the PBR site is shown in **Figure 3-15**.

To facilitate ASBJV sourcing supplies of suitable material in an environmentally sustainable manner, on 24/12/21 the EPA issued '*The WestConnex imported tunnel backfill material exemption 2021*' ('Backfill Exemption') and the '*The WestConnex imported tunnel backfill material order 2021*' (Backfill Order') under a Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the POEO (Waste) Regulation 2014. The Backfill Exemption applied to:

- The Northcote Ancillary Facility (Haberfield) – 269 Parramatta Road, Haberfield;
- The PBR site – 176 Parramatta Road, Annandale; and
- The SPI site – 2 Albert Street, St Peters.

57 Comment 8, Ref [5]

Figure 3-15 Design of PBR Access Backfill and Stub Walls (sheet 1 of 3) (Source: Ref [63])

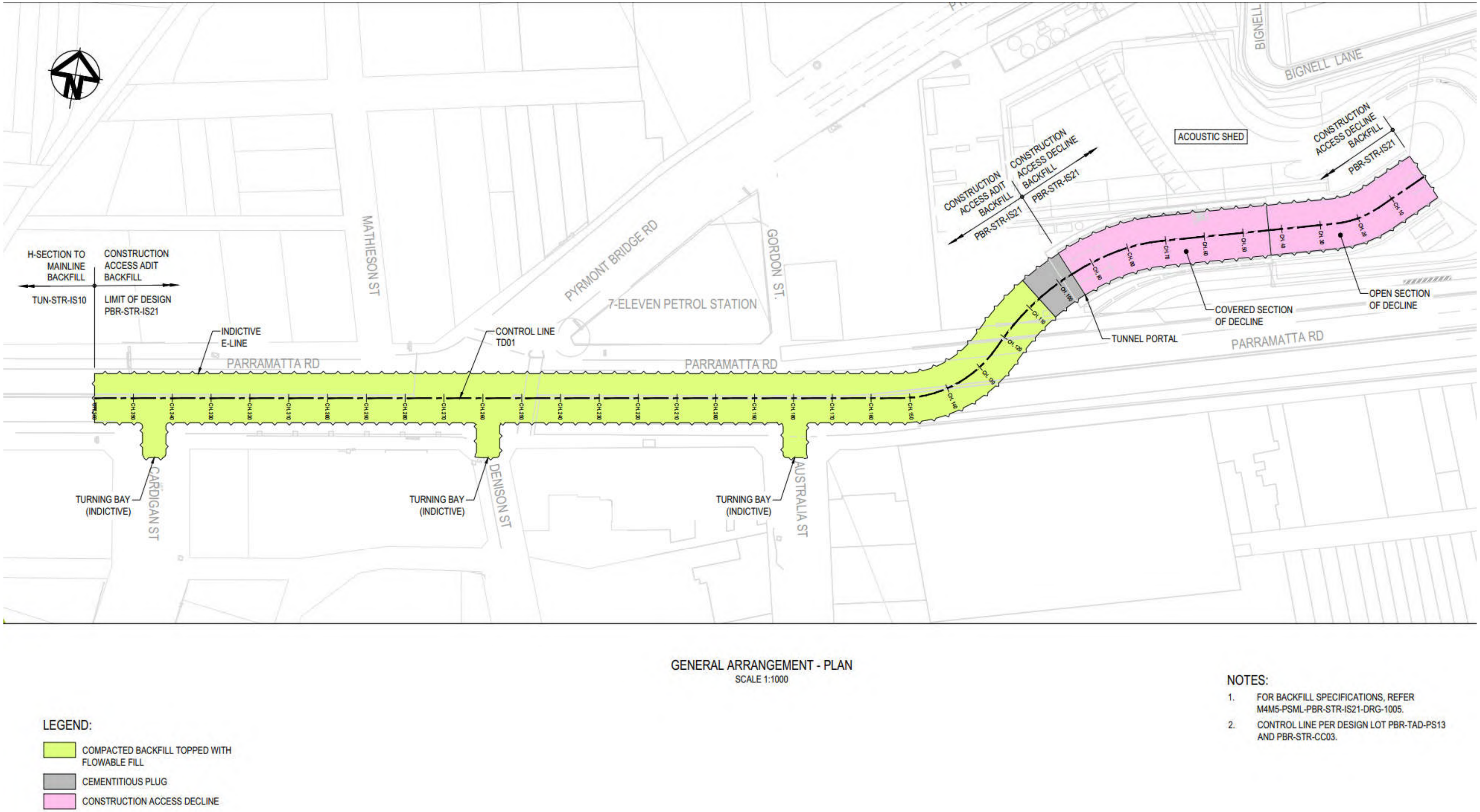
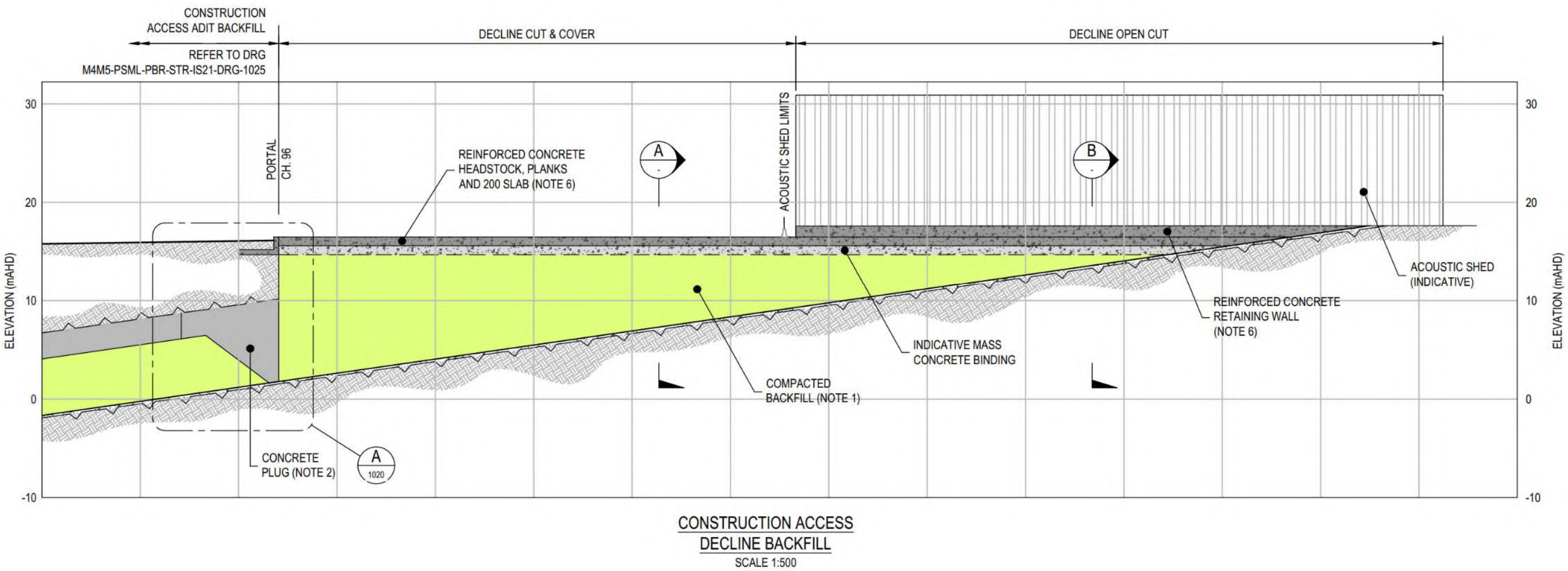


Figure 3-15 Design of PBR Access Backfill and Stub Walls (sheet 2 of 3) (Source: Ref [63])



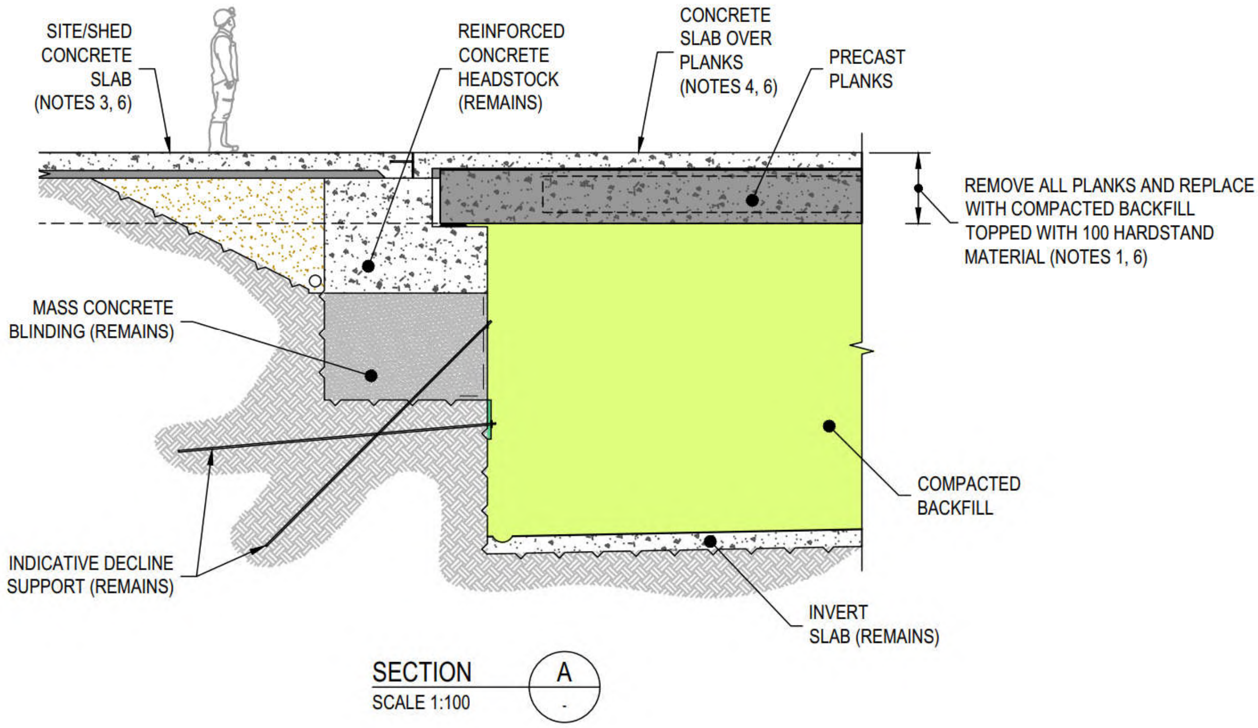
NOTES:

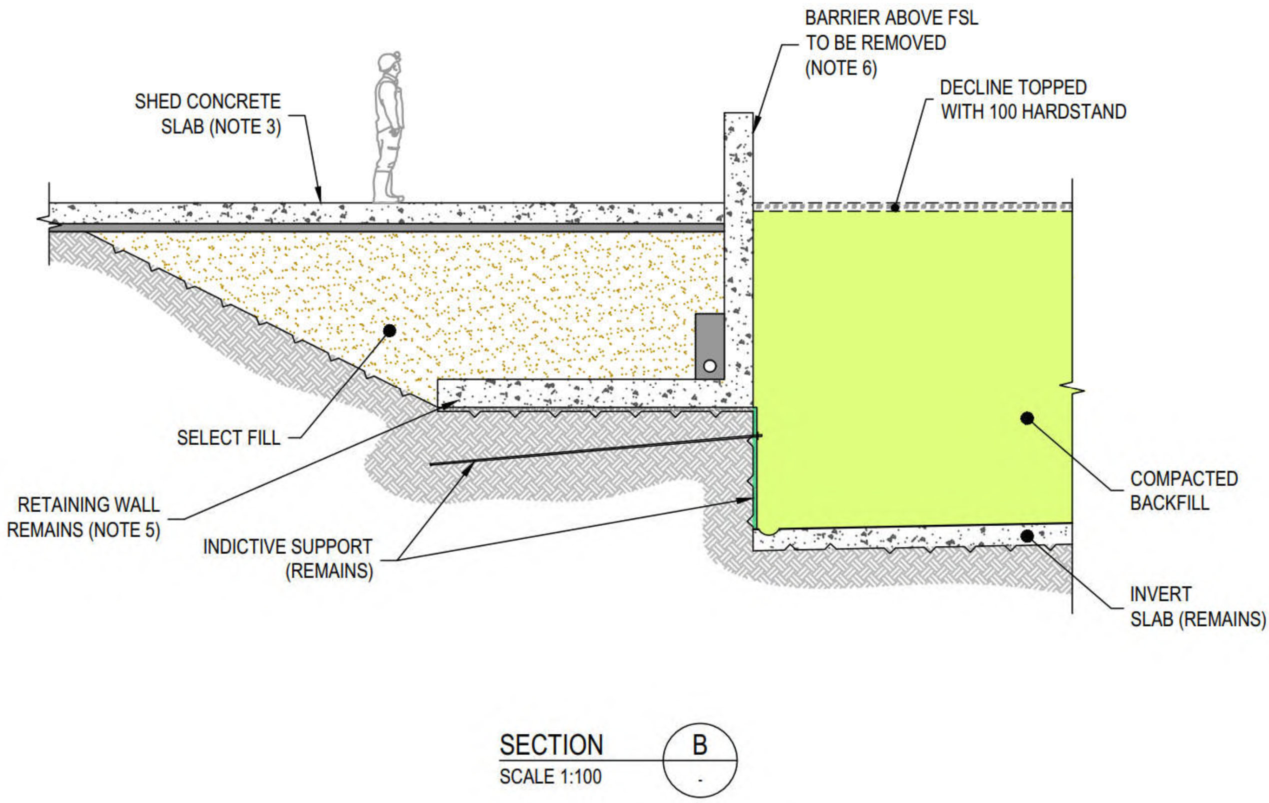
1. SLAB & PLANKS CAN BE REMOVED AT ANY TIME BEFORE OR DURING THE BACKFILLING PROCESS.
2. REFER TO DRAWING 1002 FOR MINIMUM CONCRETE STRENGTH REQUIREMENTS OF PLUG PRIOR TO ADJACENT BACKFILLING IN DECLINE.
3. SHED SLAB TO BE LEFT AS HEAVY-DUTY CONSTRUCTION GRADE HARDSTAND.
4. CONCRETE SLAB TO BE BROKEN BY MECHANICAL METHODS AND REMOVED.
5. RETAINING WALLS BELOW FSL NOT TO BE REMOVED.
6. TEMPORARY CONCRETE ELEMENTS WITHIN A DISTANCE OF 1 m BELOW THE AGREED FINAL SURFACE LEVEL WILL BE REMOVED. THE EXTENT OF SLAB AND SUBSURFACE BUILT ELEMENTS TO BE REMOVED AT THE END OF THE PROJECT WILL BE SEPARATELY CONSULTED, DISCUSSED AND AGREED WITH WCX/TfNSW WITH THE ACTUAL EXTENT TO BE RECORDED IN WAE DRAWINGS.

LEGEND:

- COMPACTED BACKFILL
- FLOWABLE FILL
- BLINDING MASS CONCRETE
- REINFORCED CONCRETE
- HARDSTAND

Figure 3-15 Design of PBR Access Backfill and Stub Walls (sheet 3 of 3) (Source: Ref [63])





Some of the features of the Backfill Order were:

- The backfill material was to be naturally occurring rock and soil (including but not limited to materials such as sandstone, shale and clay) that:
  - had been excavated from the ground;
  - did not contain chlorinated hydrocarbons, OCPs, PFASs and PCBs;
  - contained at least 98% (by weight) natural material; and
  - did not meet the definition of VENM
- The was not include material located in a hotspot; that had been processed; or that contained asbestos, ASS, PASS or sulfidic ores.
- The Backfill Order commenced on 24 December 2021 and was valid until 24 December 2023 or until revoked by the EPA by notice in writing at an earlier date.
- Prior to sampling the backfill material, the generator must:
  - Engage an environmental practitioner to undertake a desktop assessment of the source site in which the backfill material was generated to determine the likelihood for PCBs, PFASs, OCPS, and chlorinated hydrocarbons to be present; and
  - Where the environmental practitioner determined that there was a likelihood of PCBs, PFASs, OCPS, and chlorinated hydrocarbons being present at the source site, the backfill material must be sampled and tested for that contaminant.
- For backfill material in stockpiles, the number and type of samples and tested needing to be done by the generator were:
  - Composite samples for attributes 1 to 10 and 18 in Column 1 of Table 4;
  - Discrete samples for attributes 11 to 17 in Column 1 of Table 4;
  - The generator must carry out sampling in a way ensuring that the samples taken are representative of the material from the entire stockpile;
  - All parts of the stockpile must be equally accessible for sampling;
  - For stockpiles greater than 4,000 t the number of samples described in Table 1 must be repeated.

Table 1

Sampling of Stockpiled Material		
Column 1	**Column 2**	**Column 3**
Quantity (tonnes)	**Number of samples**	**Validation**
<500	3	Required
500 – 1,000	4	
1,000 – 2,000	5	
2,000 – 3,000	7	
3,000 – 4,000	10	

- For sampling backfill material in-situ, the generator must:
  - Undertake sampling by collecting discrete samples. Compositing of samples was not permitted for in situ materials;
  - Undertake characterisation sampling for the range of chemicals and other attributes listed in Column 1 of Table 4 according to the requirements listed in Columns 1, 2 and 3 of Table 2.

When the ground surface was not comprised of soil (e.g. concrete slab), samples must be taken at the depth at which the soil commenced;

- Undertake sampling at depth according to Column 1 of Table 3;
- Collect additional soil samples (and analyse them for the range of chemicals and other attributes listed in Column 1 of Table 4), at any depth exhibiting discolouration, staining, odour or other indicators of contamination inconsistent with soil samples collected at the depth intervals indicated in Table 3;
- Segregate and exclude hotspots identified in accordance with Table 2, from material excavated for reuse; and
- Subdivide sites larger than 50,000 m² into smaller areas and sample each area as per Table 2.

Table 2

***In Situ* Sampling at surface**				
Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
Size of *in situ* area (m^2)	**Number of systematic sampling points recommended**	**Distance between two sampling points** (m)	**Diameter of the hot spot that can be detected with 95% confidence** (m)	**Validation**
500	5	10.0	11.8	Required
1000	6	12.9	15.2	
2000	7	16.9	19.9	
3000	9	18.2	21.5	
4000	11	19.1	22.5	
5000	13	19.6	23.1	
6000	15	20.0	23.6	
7000	17	20.3	23.9	
8000	19	20.5	24.2	
9000	20	21.2	25.0	
10,000	21	21.8	25.7	
15,000	25	25.0	28.9	
20,000	30	25.8	30.5	
25,000	35	26.7	31.5	
30,000	40	27.5	32.4	
35,000	45	27.9	32.9	
40,000	50	28.3	33.4	
45,000	52	29.3	34.6	
50,000	55	30.2	35.6	

Table 2 has been taken from NSW EPA 1995, *Contaminated Sites Sampling Design Guidelines*, NSW Environment Protection Authority.

Table 3

***In Situ* Sampling at Depth**	
Column 1	**Column 2**
Sampling Requirements *	**Validation**
1 soil sample at 1.0 m bgl from each surface sampling point followed by 1 soil sample for every metre thereafter. From 1.0 m bgl, sample at the next metre interval until the proposed depth of excavation of the material is reached. If the proposed depth of excavation is between 0.5 to 0.9 m after the last metre interval, sample at the base of the proposed depth of excavation.	Required if the depth of excavation is equal to or greater than 1.0 m bgl

* Refer to Notes for examples

- Backfill material must not be supplied to WestConnex if:
  - A sample concentration exceeded the absolute maximum concentration or other value listed in Column 3 of Table 4; or
  - The average concentration exceeded the maximum average concentration or other value listed in Column 2 of Table 4.

Table 4

Column 1	Column 2	Column 3
Chemicals and other attributes	**Maximum average concentration for characterisation** (mg/kg 'dry weight' unless otherwise specified)	**Absolute maximum concentration** (mg/kg 'dry weight' unless otherwise specified)
1. Mercury	1.0	1.5
2. Cadmium	5	8
3. Lead	300	500
4. Arsenic	40	60
5. Chromium (total)	75	150
6. Copper	150	300
7. Nickel	80	150
8. Zinc	350	920
9. Electrical Conductivity	N/A	N/A
10. pH[1]	5 to 10	5 to 10
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	40	80
12. Benzo(a)pyrene	3	5
13. Benzene	N/A	1
14. Toluene	N/A	65
15. Ethyl-benzene	N/A	25
16. Xylene	N/A	15
17. Total Recoverable Hydrocarbons (TRH) C_6- C_{10} or F1 [2, 3]	N/A	50
18. TRH C_{10} – C_{16} or F2 [2, 4]	100	185
19. TRH C_{17} – C_{34} or F3 [2]	200	380
20. TRH C_{35} – C_{40} or F4 [2]	270	380
21. Asbestos	N/A	No asbestos found[5]
22. Foreign materials – Rubber, plastic, bitumen, paper, cloth, paint and engineered wood products and preservative treated or coated wood residues.	0.05%	0.1%

Notes:

1. The ranges given for pH are for the minimum and maximum acceptable pH values in the material.
2. The TRH test may include silica gel clean-up. The absolute maximum concentration and the maximum average concentration may include silica gel clean-up. TRH silica gel clean-up may be undertaken if the initial TRH test (without silica gel clean-up) exceeds the absolute maximum concentration or the maximum average concentration.
3. To obtain F1, subtract the sum of BTEX concentrations from the F1 fraction.
4. To obtain F2, subtract naphthalene from the F2 fraction.
5. See test method.

- The generator must keep a written record of the following for a period of six years:
  - the sampling plan required to be prepared;
  - all characterisation sampling results in relation to the WestConnex imported tunnel backfill material supplied;
  - the volume of detected hotspot material and the location;
  - the quantity of the WestConnex imported tunnel backfill material supplied; and
  - the name and address of each person to whom the generator supplied the WestConnex imported tunnel backfill material.

The tunnel backfill operation was a work-in-progress at the time this SAR was prepared and data on the work completed to-date had yet to be supplied to the Site Auditor. At the site inspection conducted by the Site Auditor on 4/11/22, it was observed that the tunnel backfill operation was well advanced at the PBR site, as shown by the photo in **Figure 3-16**.

Figure 3-16 View of Backfill in Tunnel Decline at PBR Site on 4/11/22

The Site Auditor considered the weight of evidence supported the conclusion that the only soil that was likely to have been imported to the PBR site was not contaminated above commercial / industrial D criteria and suitable for use at a road construction worksite. This is because:

- Only a minimal amount of imported material was required for the construction of the tunnel facilities at the PBR site;
- ASBJV had strict environmental management plans in place that managed the quality of material imported to the PBR site;
- The Site Auditor found no evidence of imported material at the PBR site when inspected; and
- The EPA has issued a Backfill Order / Exemption that provides strict controls on the types of material allowed to be used to backfill the tunnel decline at the PBR site.

3.9 Final Site Condition

ASBJV[58] design drawings show that final site conditions at the PBR site would consist of:

- Demolition and removal of the acoustic shed, building and tunnel support infrastructure;
- Reinstatement of Bignell Lane to its original alignment;
- Paving the entire PBR site with a range of pavement types as shown in **Figure 3-17**; and
- No exposed soils would remain at the Site.

Copies of final site condition design drawings are provided in **Appendix B**.

During the site inspection conducted on 4/11/22, demobilisation work was in its early stage, with the facilities still to be removed including the acoustic shed, the switchyard and offices, as shown by photos in **Appendix D**.

The Site Auditor addressed the need for this additional construction work to be completed by issuing a Section B SAS, which is further discussed in **Section 4**.

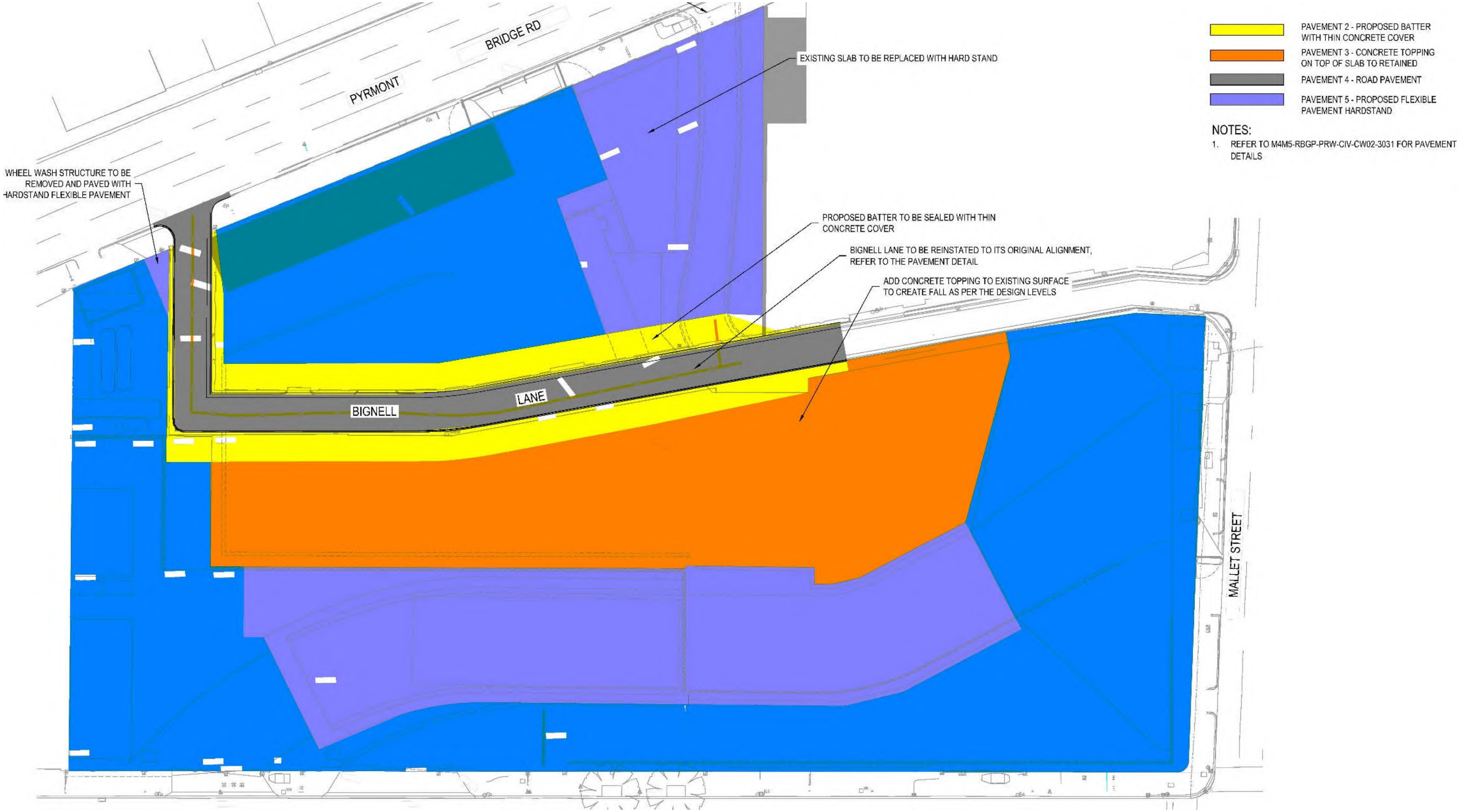
3.10 Review of LTEMP

The Site Auditor considered the approach adopted by the ASBJV environment team for managing contamination at the PBR site met the requirements of their contract, the planning consent and EPL, as described in **Section 1.2.1**, provided residual contamination risks were managed by a **LTEMP**. The contamination risks that remained at the Site and required long-term management comprised:

- TRH contamination remaining at former UST areas (**Section 3.4.4**);
- Unknown USTs remaining at the Site (**Sections 3.4.1** & **3.4.4**);
- Unknown pits remaining at the Site (**Section 3.5.1**);
- Unknown buried services remaining at the Site (**Section 3.5.2**); and
- Unknown contamination hotspots remaining in fill at the Site (**Sections 3.6.1** and **3.6.2**).

[58] Refs [64] & [65]

Figure 3-17 Pavement Plan for Reinstated Condition of PBR Site (Source: Document No: M4M5 -RBGP-PRW- CIV - CW02-DRG- 3030, Ref [64])



4. Conclusions

The Site Auditor considered the approach adopted by the ASBJV environment team for managing contamination at the PBR site met the requirements of their contract, the planning consent and EPL, as described in **Section 1.2.1**, for the reasons given in **Section 3**.

The Site Auditor considered that the weight of evidence supported the conclusions that:

- ASBJV managed contamination at the PBR site that ASBJV interfered or disturbed during the course of carrying out its work on the WestConnex Stage 3A project;
- Contamination was not generated at the PBR site;
- Contamination was not generated at the PBR site that caused an increase in contamination migrating from the Project site;
- The PBR site was returned to a condition suitable for a road construction worksite provided residual contamination risks were managed in accordance with an LTEMP prepared by an experienced environmental consultant that met EPA guidelines and was approved in writing by the Site Auditor and TfNSW; and
- The work generally complied with the requirements of EPL 21149 in relation to the management of site contamination.

The Site Auditor identified data gaps that needed to be addressed by ASBJV concerning:

- The classification and disposal of excavated soil that was removed from the PBR site and disposed as waste, which are described in **Section 3.7**;
- The importation of backfill material for placement in the tunnel decline, which was a work-in-progress at the time this SAR was prepared, as described in **Section 3.8**; and
- Demobilisation work and reinstatement of the PBR site to its final condition at hand over was a work-in-progress at the time this SAR was prepared, as described in **Section 3.9**.

The Site Auditor considered the issuing of a Section B SAS would allow these data gaps to be addressed prior to a Section A2 SAS being issued.

The contamination risks that remained at the Site and required long-term management by means of an LTEMP comprised:

- TRH contamination remaining at former UST areas;
- Unknown USTs remaining at the Site;
- Unknown pits remaining at the Site;
- Unknown buried services remaining at the Site; and
- Unknown contamination hotspots remaining in fill at the Site.

The Site Auditor addressed the need for an LTEMP to be prepared, for data gaps concerning exported and imported materials to be addressed, and for minor construction work to be completed at the PBR site by:

- Having ASBJV issue an interim plan outlining the additional work that needed to be undertaken prior to the issuing of a Section A2 SAS; and
- Issuing a Section B SAS.

Copies of the Section B SAS and the ASBJV interim plan are provided in **Appendix E**.

5. Other Relevant Information

This SAR and the accompanying SAS relates to the WestConnex Stage 3A Pyrmont Bridge Road (PBR) worksite (Area C9). This SAR was prepared in accordance with the Contaminated Land Management Act 1997 (as amended). 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 ASBJV (the 'Client') for the purposes nominated in the audit report. It is acknowledged that the audit report and statement may be used by TfNSW, the Department of Planning and the NSW 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 environmental consultants on the PBR site (SESL and Alliance) 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 was taken, to the extent practical under normal auditing procedures, to assure adequacy of the information, the Site Auditor and Ian Swane & Associates 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 PBR site at the time the audit was undertaken. The Site Auditor and Ian Swane & Associates 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 SPI site is being properly maintained to a condition suitable for its proposed land uses.

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.

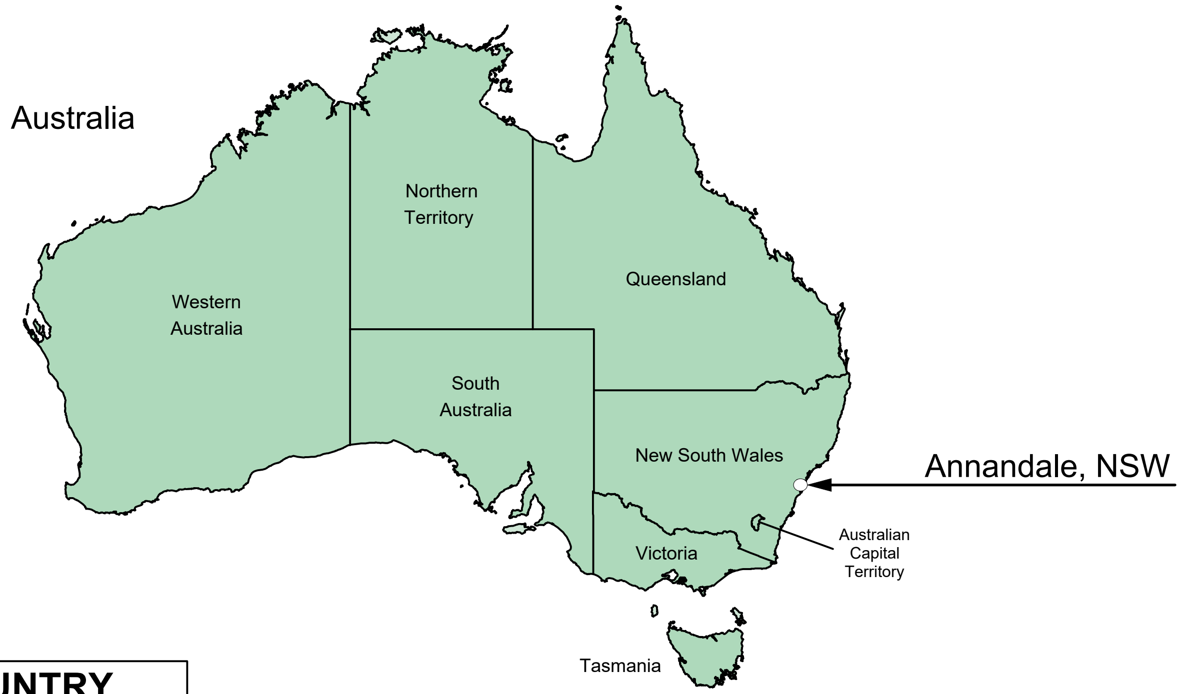
Yours faithfully

Ian C Swane

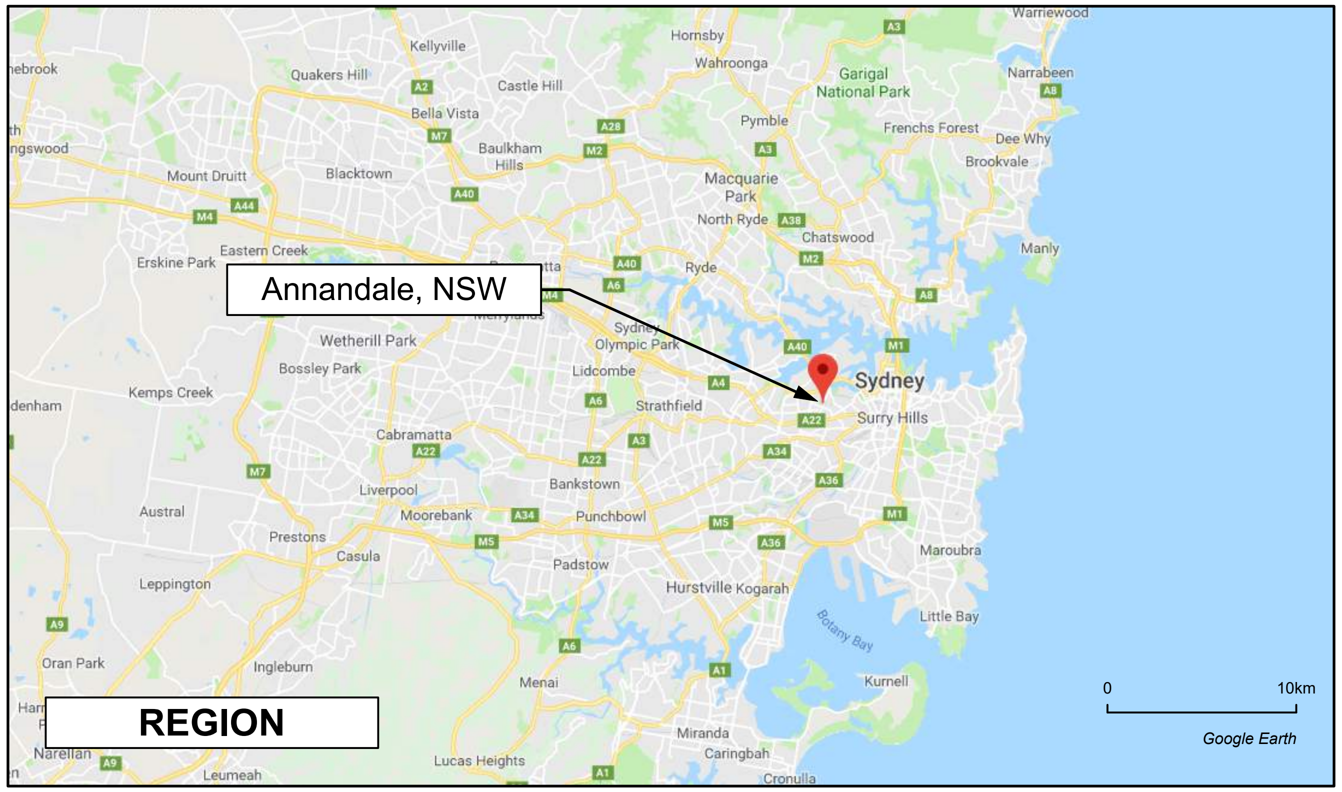
Dr Ian C Swane (CPEng, CEnvP & CSCS)
Accredited EPA Site Auditor
Director, Ian Swane & Associates Phone: 0418 867 112 Email: iswane@bigpond.com

Appendix A. Figures & Tables from Investigation Reports

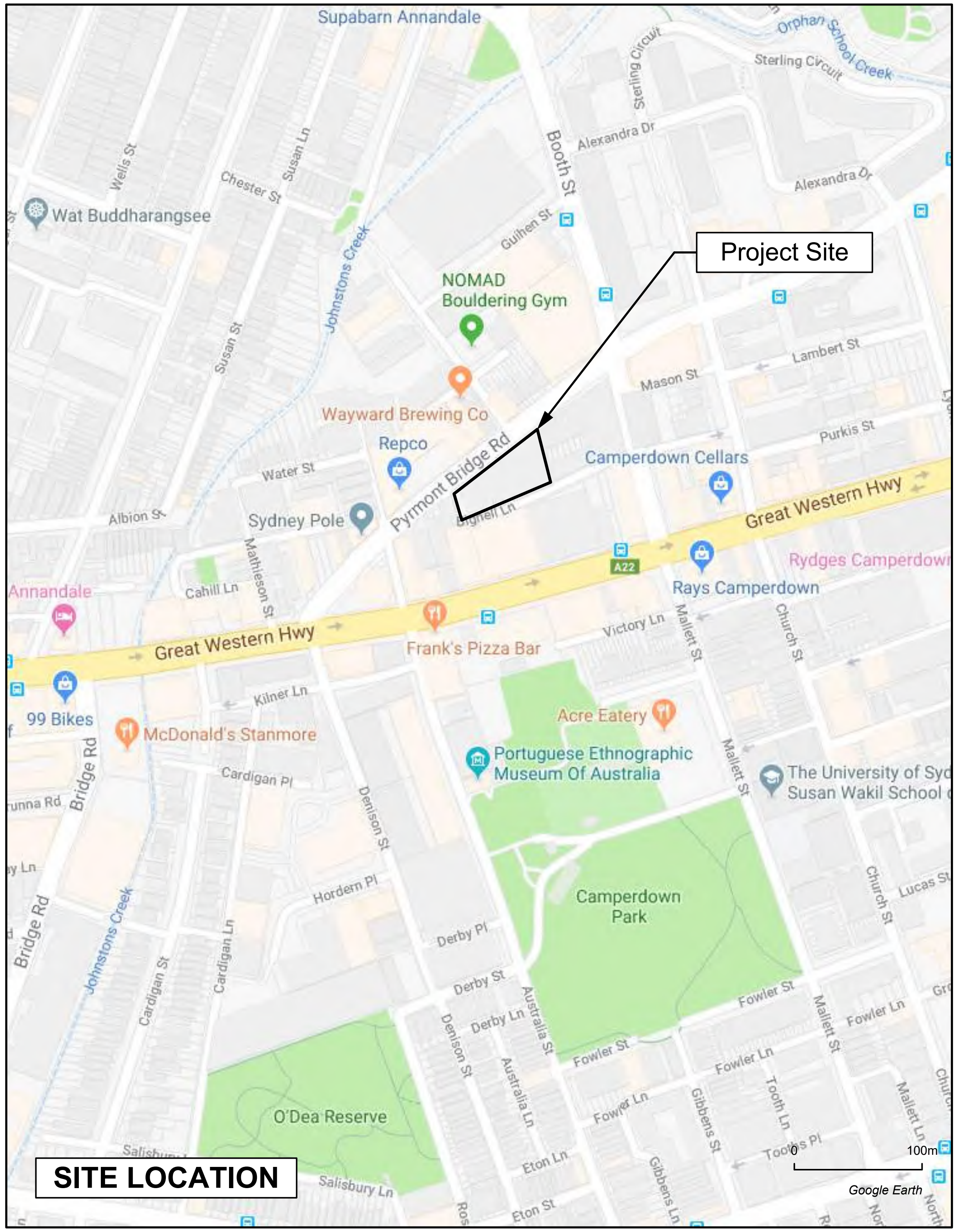
SESL (February 2019)
PSI for 79 PBR Area



COUNTRY



REGION



SITE LOCATION

VER	DATE	AMENDMENTS	DRW	CKD
02	16/11/2018	typo on F1 corrected	LDW	
01	08/11/2018	initial draft	LDW	

COMMERCIAL IN CONFIDENCE

SESL AUSTRALIA Environment & Soil Sciences

16 Chilvers Road, Thornleigh NSW 2120 www.sesl.com.au

ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 1
SITE LOCATION

Project Ref:	J001247
Project:	Preliminary Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

J001247 Annandale Figures V2.vwx • Friday, November 16, 2018 3:51:16 PM • drawn by laurie white at www.reumad.com.au

J001247 Annandale Figures V2.vwx • Friday, November 16, 2018 3:51:16 PM • drawn by laurie white at www.reumad.com.au

VER	DATE	AMENDMENTS	DRW	CKD
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ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 2
SITE BOUNDARY

Project Ref:	J001247
Project:	Preliminary Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259	Northing: 6248957	Datum mAHD; UTM MGA 56H	PRINT: A3 (L)

J001247 Annandale Figures V2.vwx • Friday, November 16, 2018 3:51:16 PM • drawn by laurie white at www.reumad.com.au

VER	DATE	AMENDMENTS	DRW	CKD
02	16/11/2018	typo on F1 corrected	LDW	
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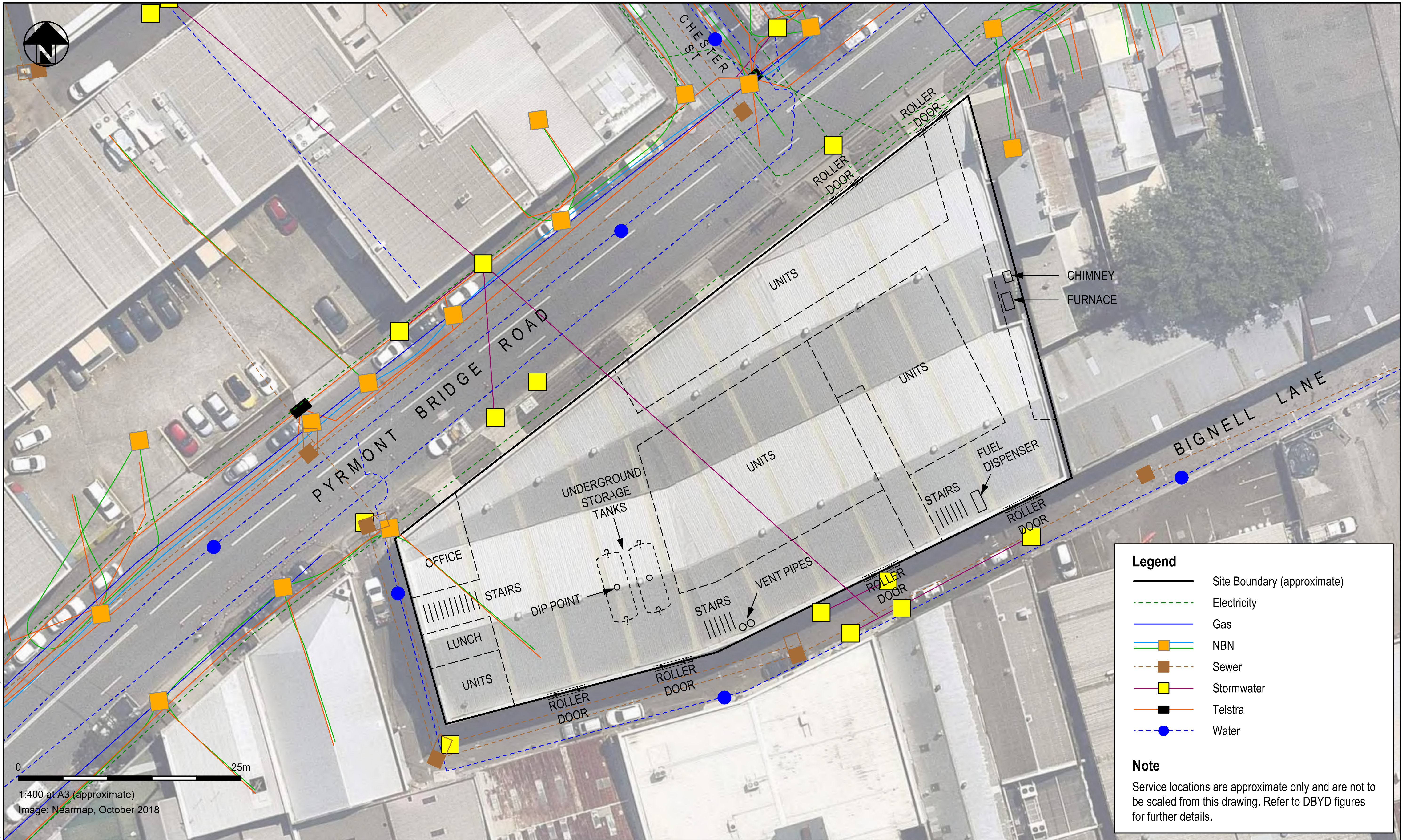
ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 3
FEATURES OF INTEREST

Project Ref:	J001247
Project:	Preliminary Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259	Northing: 6248957	Datum mAHD; UTM MGA 56H	PRINT: A3 (L)



J001247 Annandale Figures V2.vwx • Friday, November 16, 2018 3:51:16 PM • drawn by laurie white at www.reumad.com.au

VER	DATE	AMENDMENTS	DRW	CKD
02	16/11/2018	typo on F1 corrected	LDW	
01	08/11/2018	initial draft	LDW	

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ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

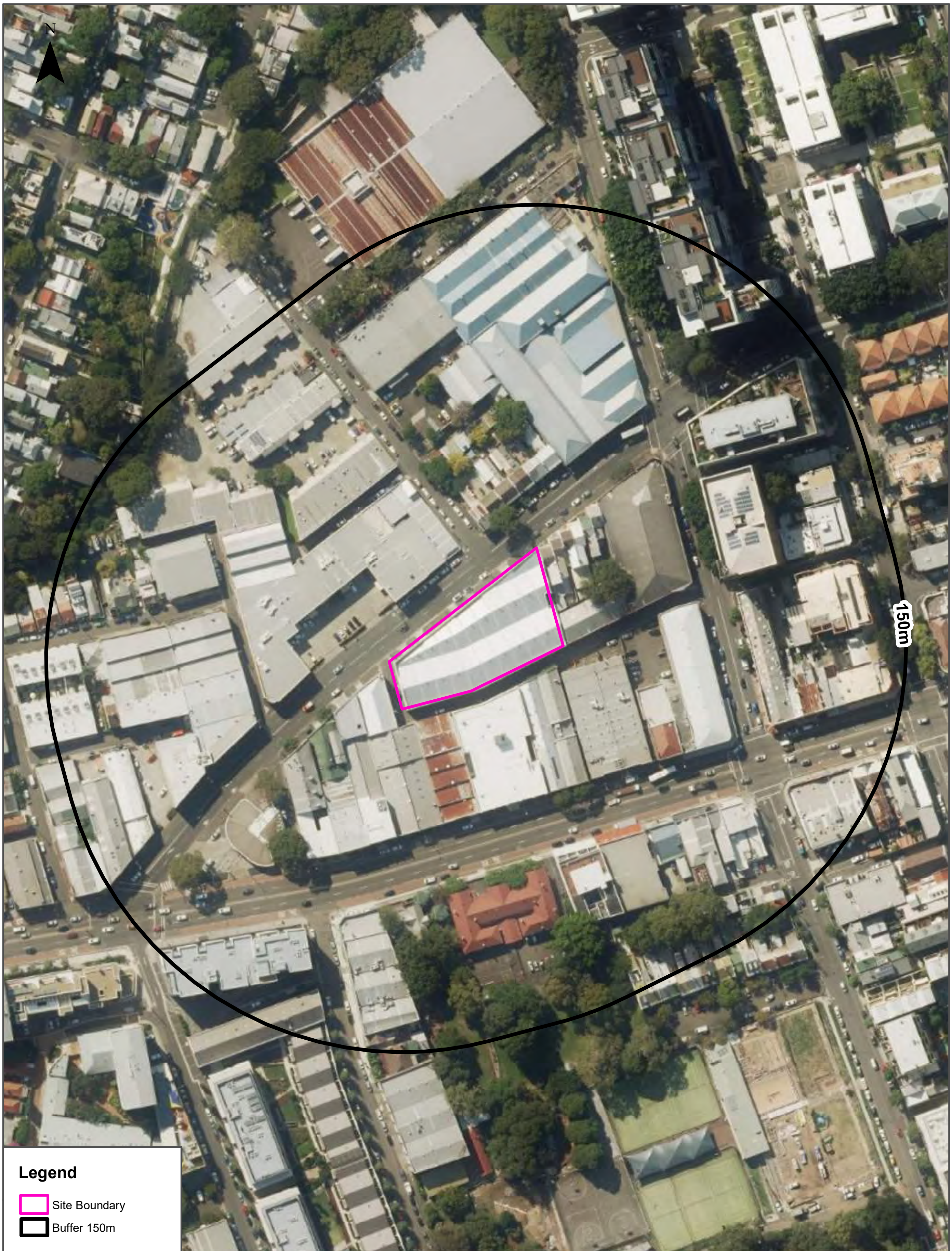
FIGURE 4
SITE LAYOUT

Project Ref:	J001247
Project:	Preliminary Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

Aerial Imagery 2016

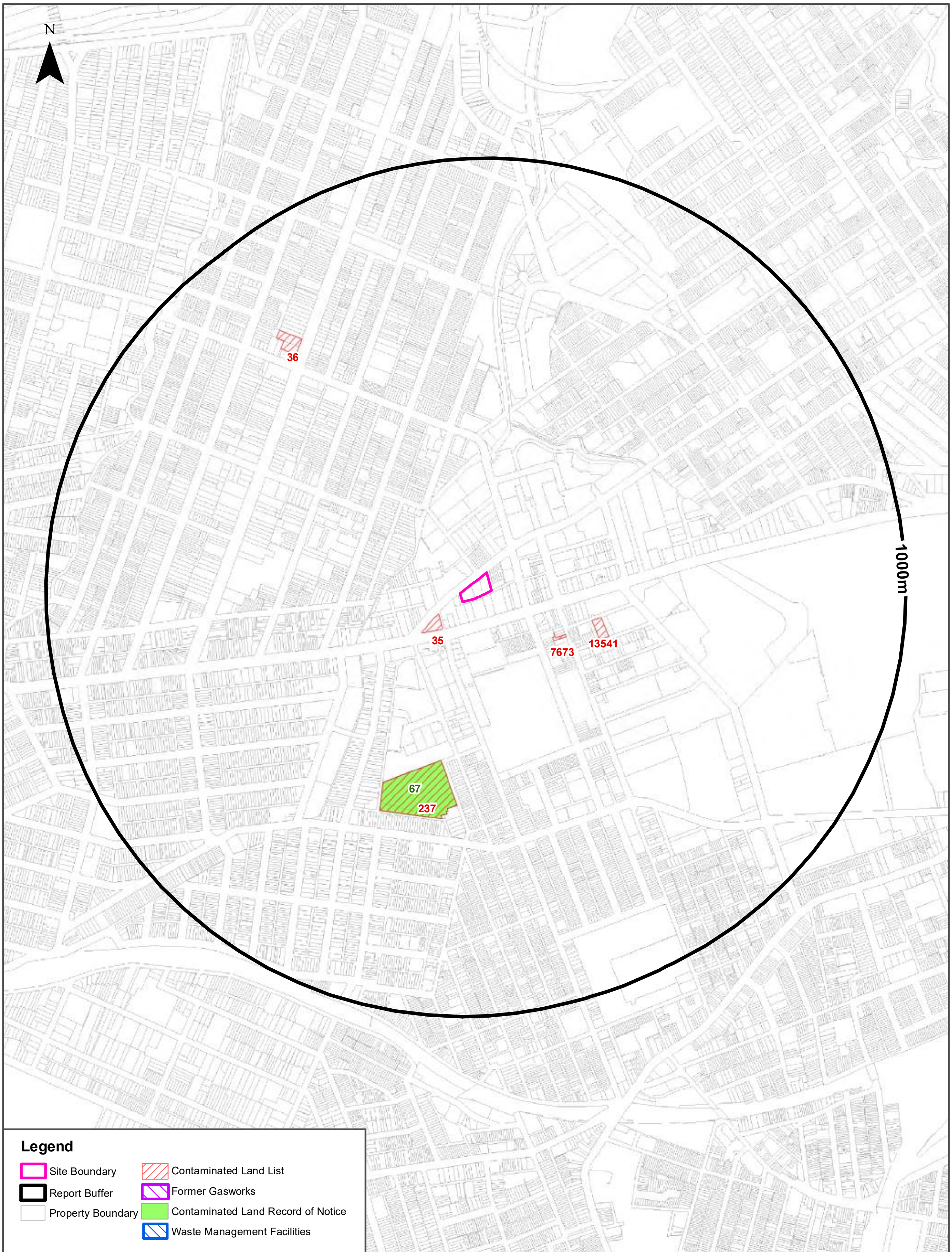
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 50 100 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Contaminated Land & Waste Management Facilities

79 Pyrmont Bridge Road, Annandale, NSW 2038



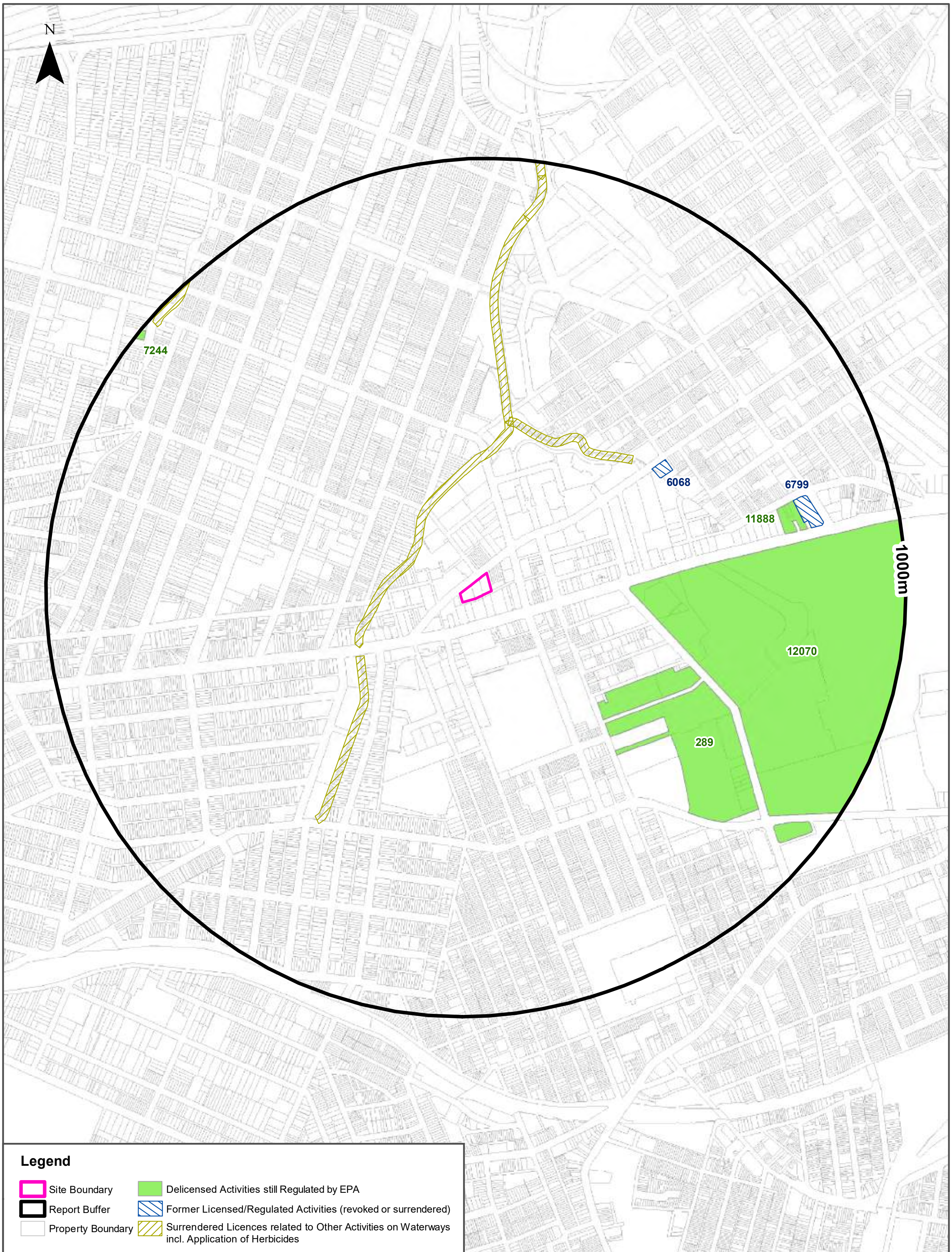
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 12 September 2018

Delicensed & Former Licensed EPA Activities

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary
Report Buffer
Property Boundary
Delicensed Activities still Regulated by EPA
Former Licensed/Regulated Activities (revoked or surrendered)
Surrendered Licences related to Other Activities on Waterways incl. Application of Herbicides

Scale: 0 100 200 400 600 Meters

Property Boundary Data Source:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 12 September 2018

Aerial Imagery 2015

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Aerial Imagery 2009

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters

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Date: 10 September 2018

Aerial Imagery 2002

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Aerial Imagery 1991

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale:
0 25 50 100
Meters

Data Sources: Aerial Imagery © Department Finance, Services & Innovation

Coordinate System: GDA 1994 MGA Zone 56

Date: 12 September 2018

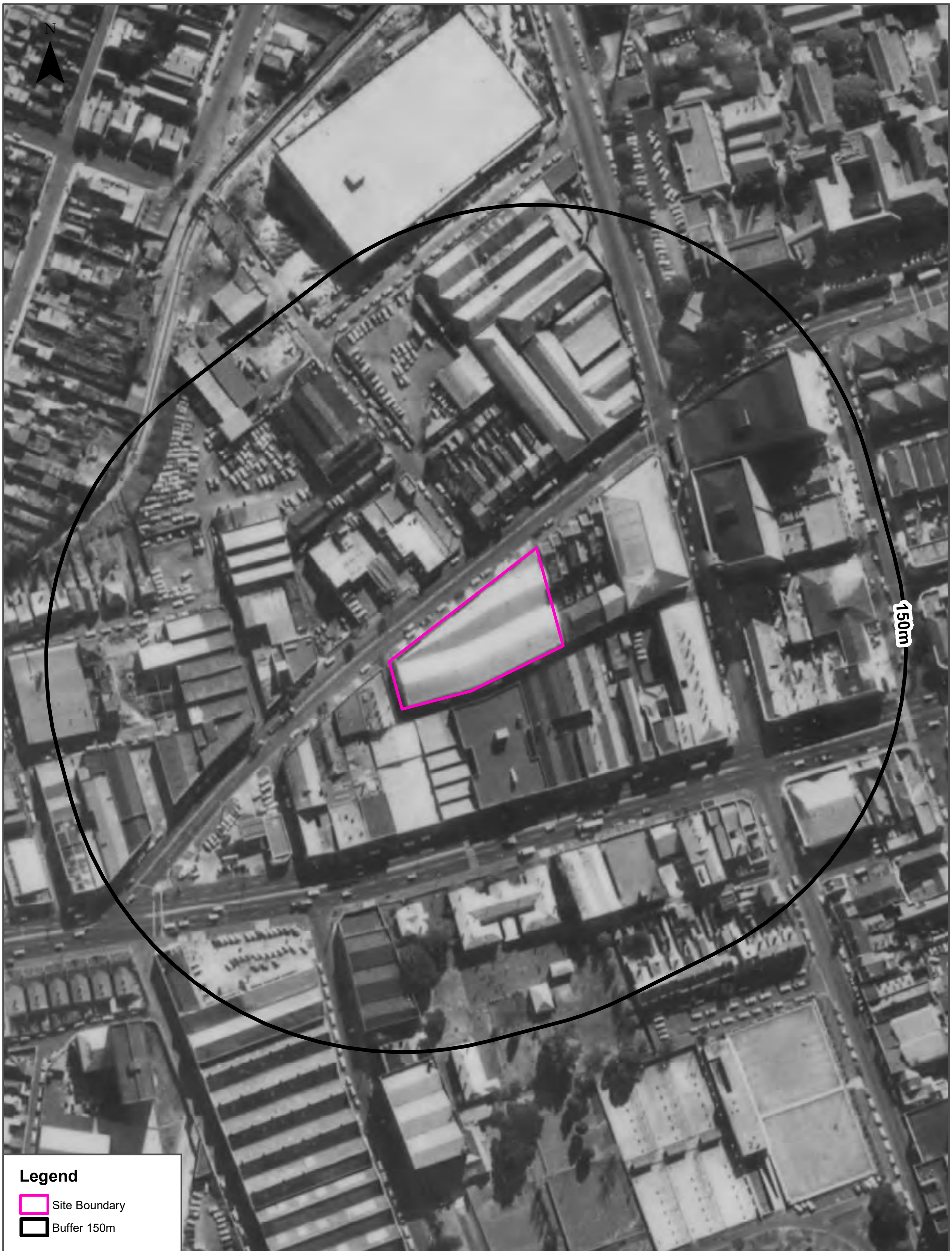
Aerial Imagery 1982

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Aerial Imagery 1970

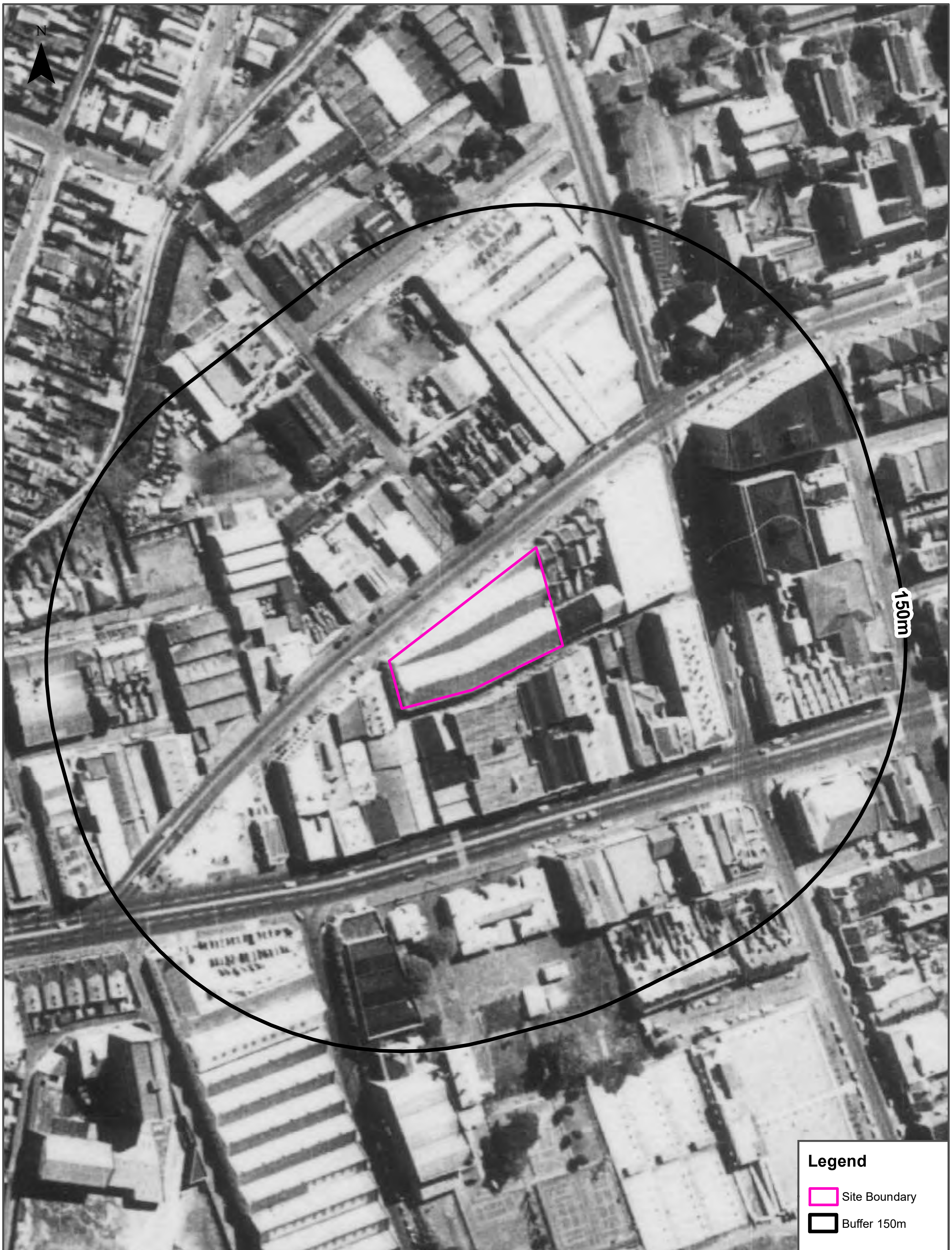
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Aerial Imagery 1965

79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale:
0 25 50 100
Meters

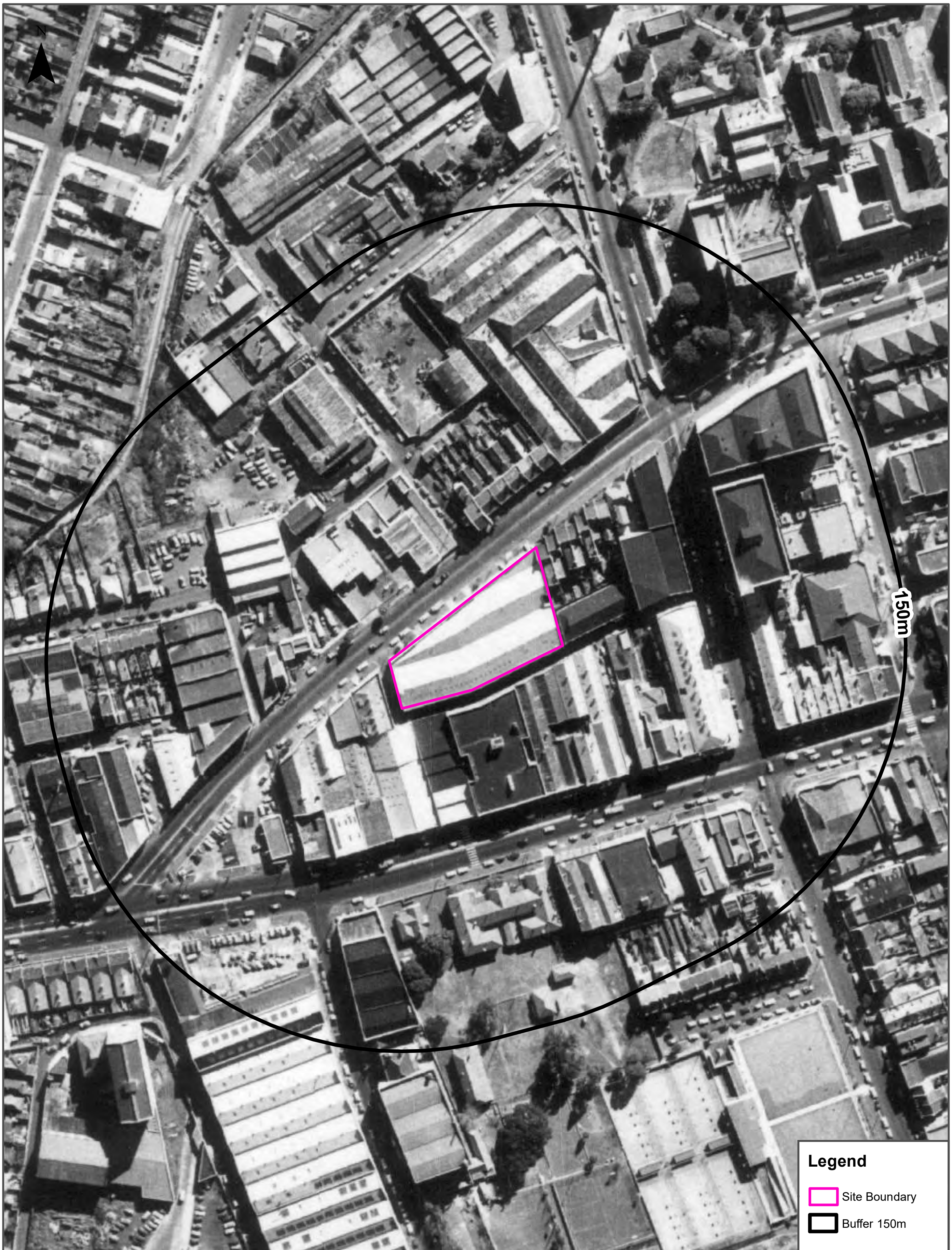
Data Source Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 10 September 2018

Aerial Imagery 1961

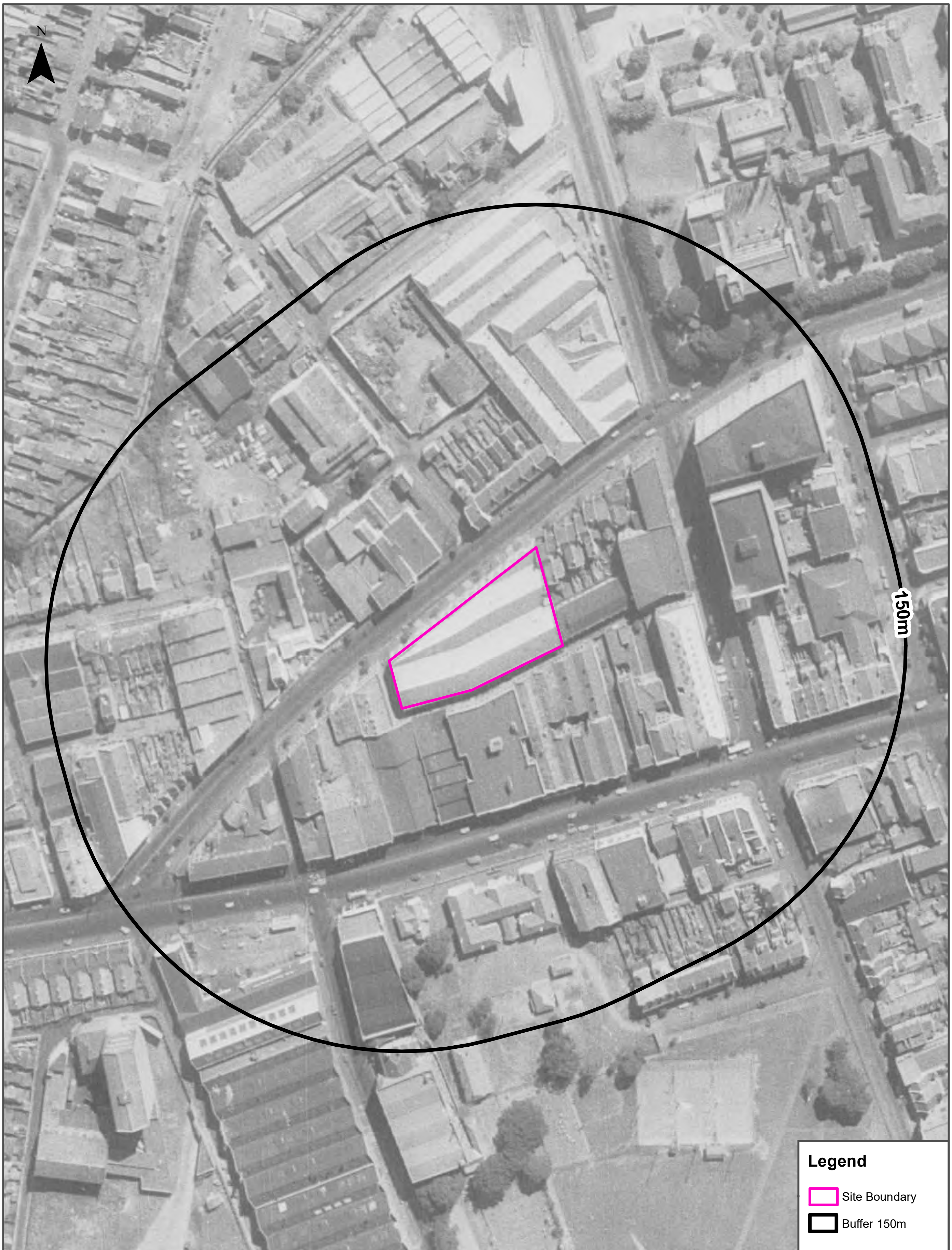
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Aerial Imagery 1955

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

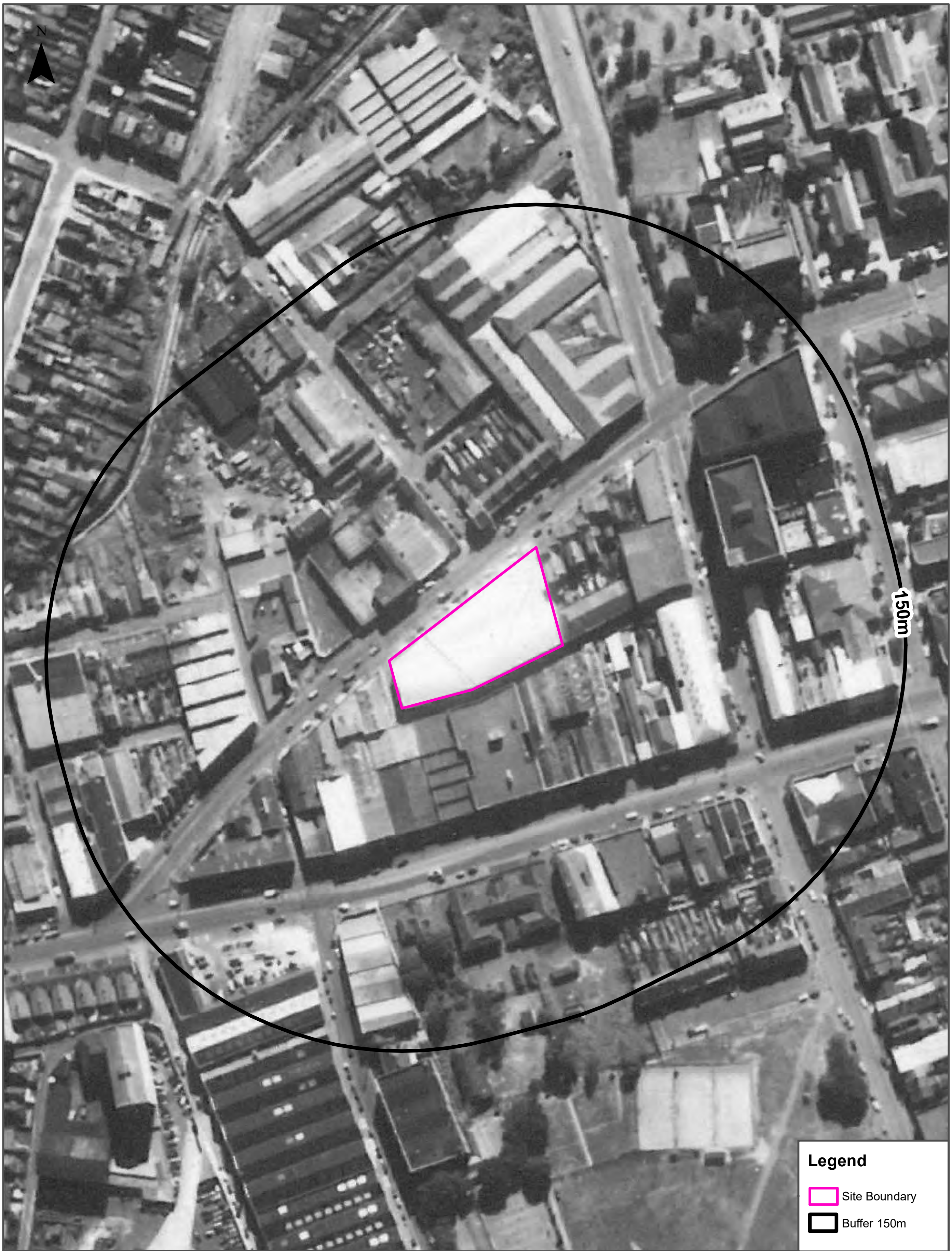
Site Boundary

Buffer 150m

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Aerial Imagery 1951

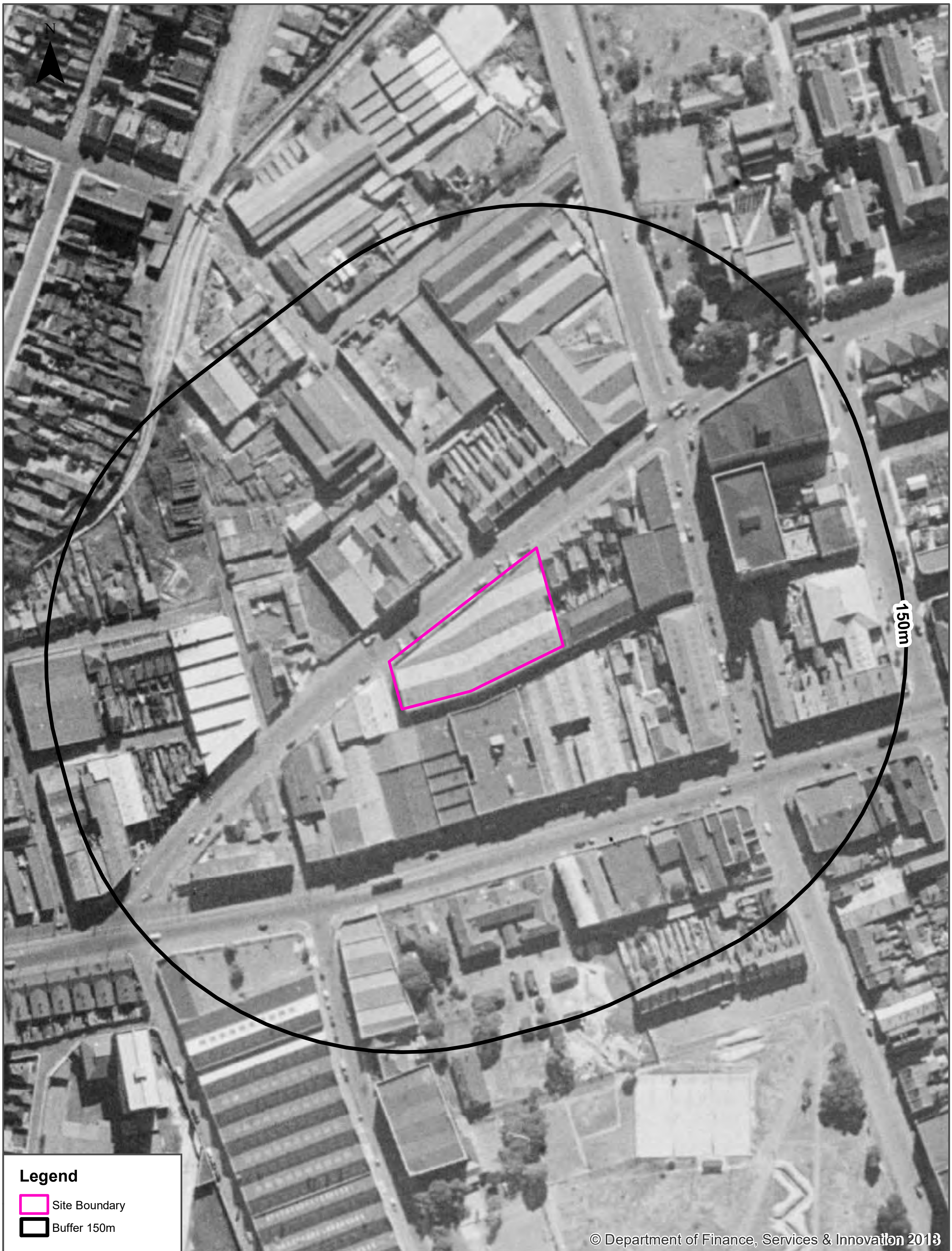
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Aerial Imagery 1943

79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

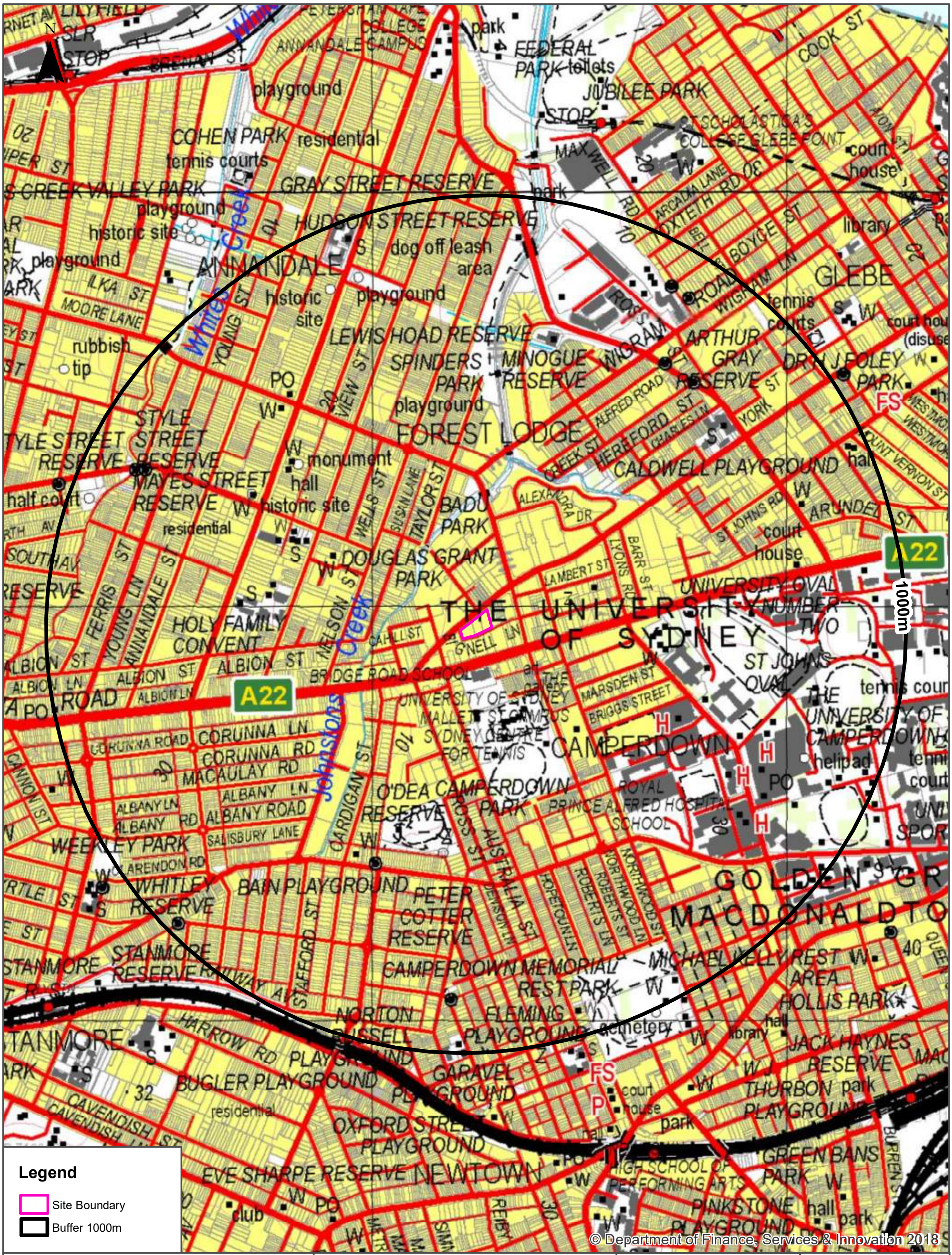
Aerial Imagery 1930

79 Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 10 September 2018

Topographic Map 2015

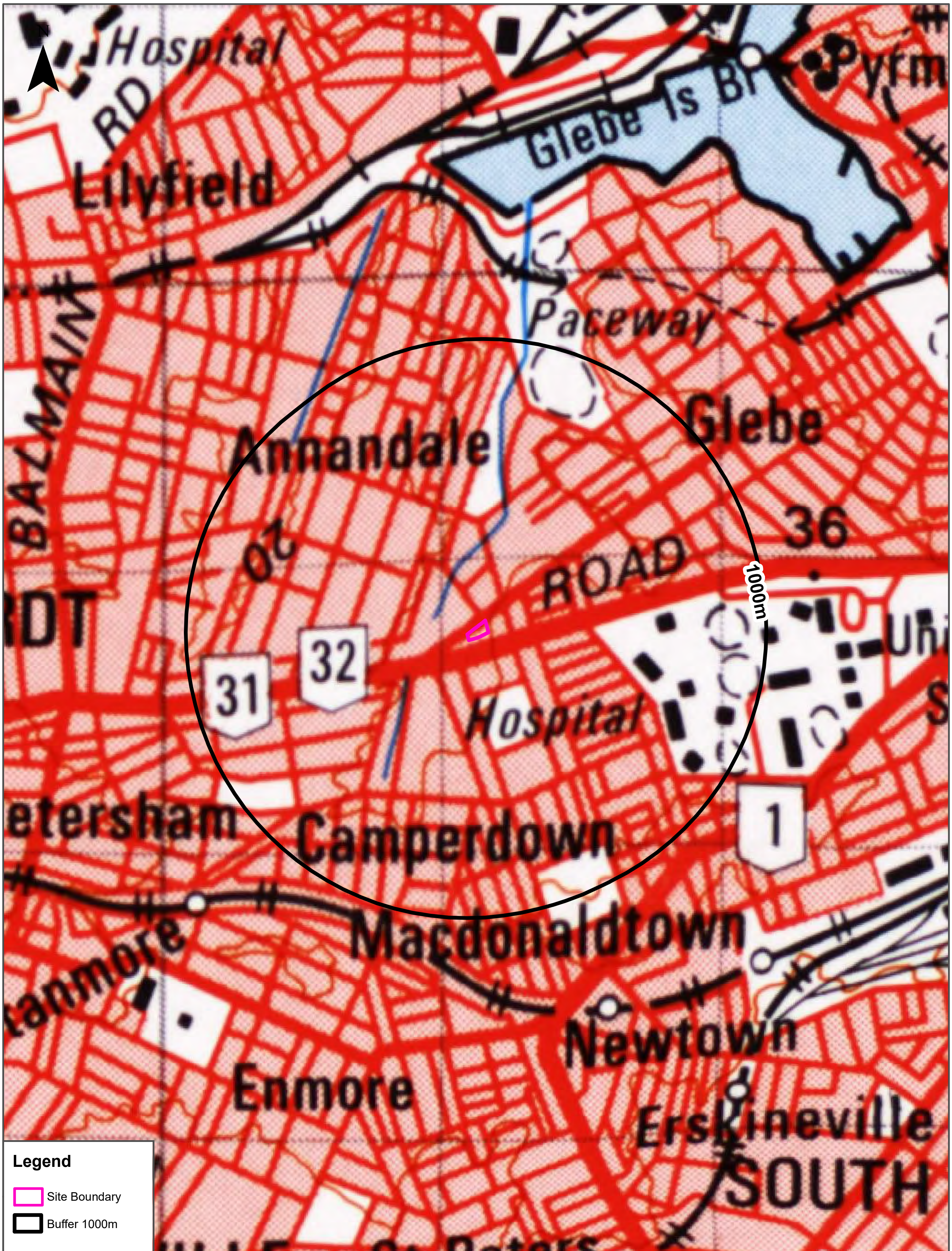
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Historical Map 1975

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

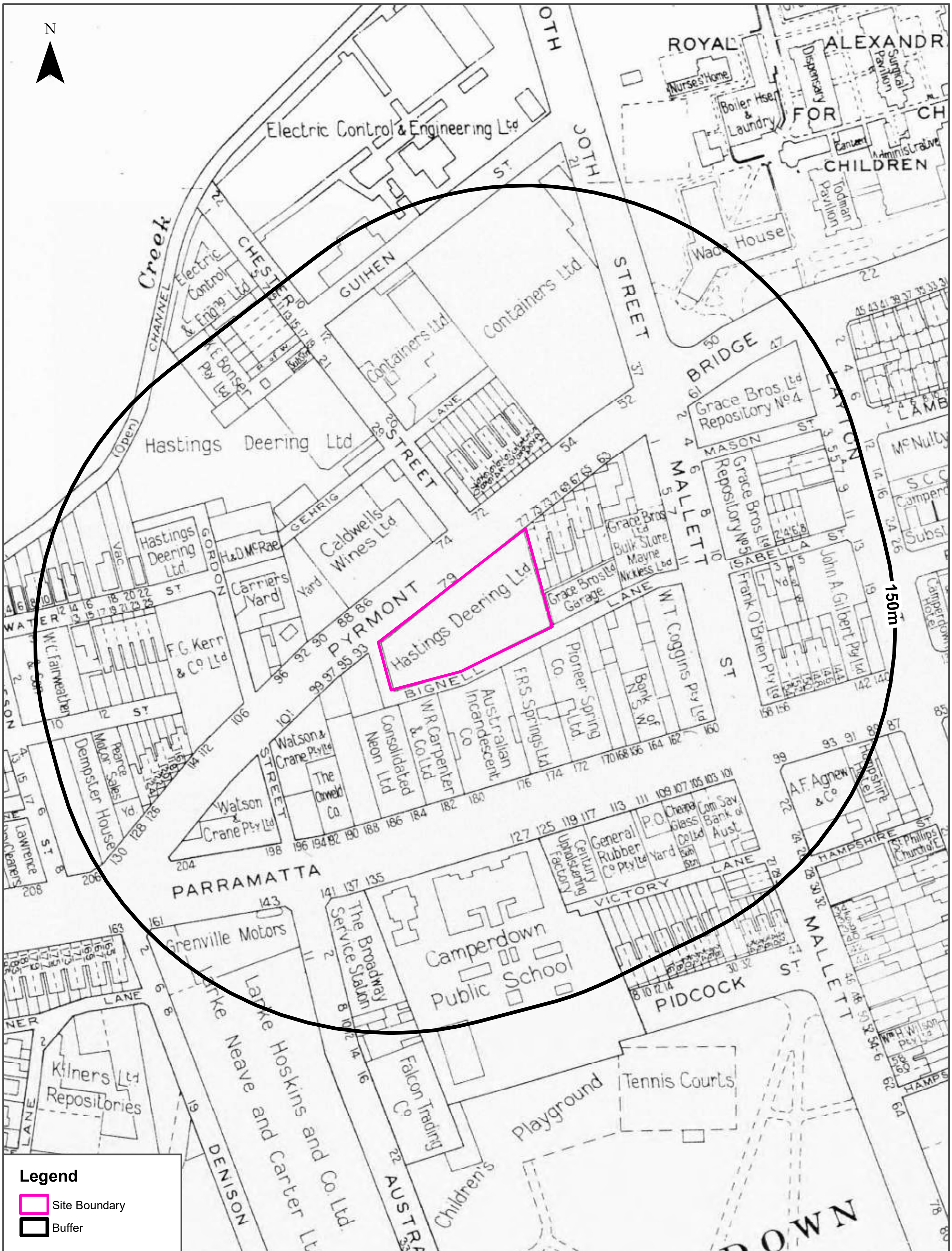
Site Boundary

Buffer 1000m

Scale: 0 200 400 800 Meters	Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 September 2018

Historical Map 1956

79 Pyrmont Bridge Road, Annandale, NSW 2038



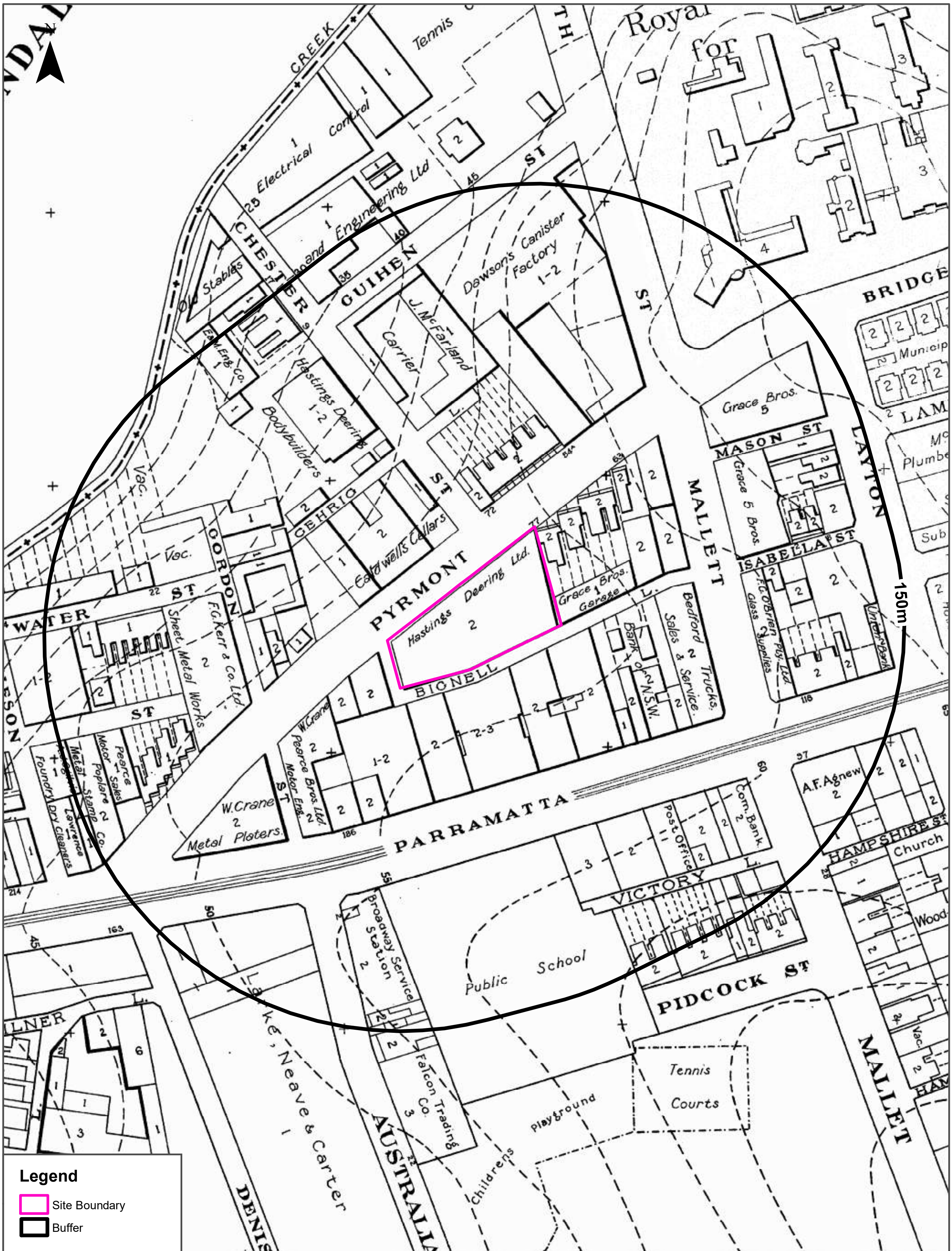
Legend

- Site Boundary
- Buffer

Scale: 0 – 25 – 50 – 100 Meters	Data Sources: City Building Surveyor Sheets Building Regulation Branch - City Building Surveyor's Department, Council of the City of Sydney	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Historical Map 1938-1950

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary

Buffer

Scale: 0 25 50 100 Meters

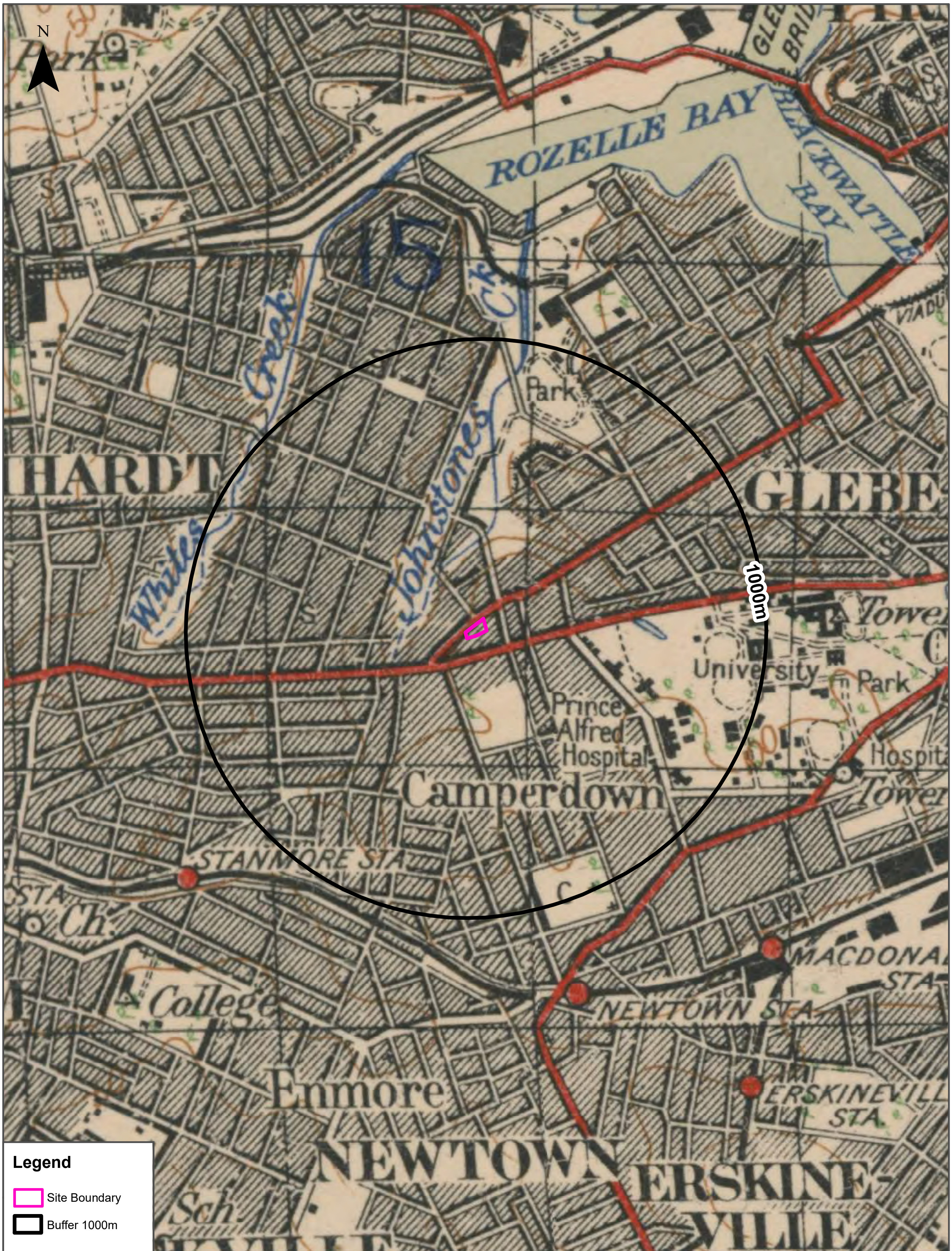
Data Sources: Sydney City Civic Survey 1938 - 1950 Town Planning Branch - City Engineers Department, Council of the City of Sydney

Coordinate System: GDA 1994 MGA Zone 56

Date: 12 September 2018

Historical Map c.1936

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

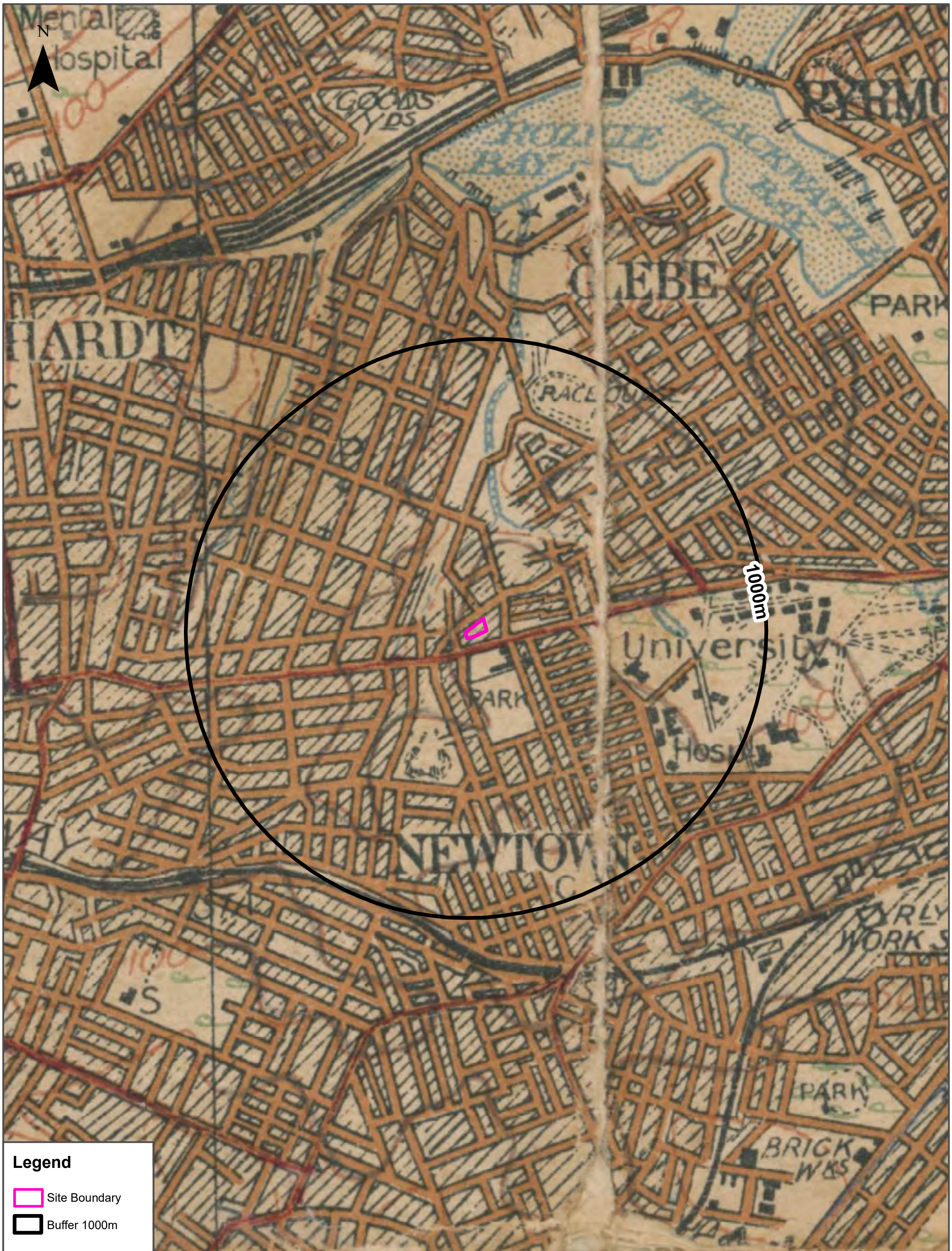
Site Boundary

Buffer 1000m

Scale: 0 200 400 800 Meters	Data Sources: Australia 1:63360 Prepared by Commonwealth Section Imperial General Staff	Coordinate System: GDA 1994 MGA Zone 56	Date: 11 September 2018

Historical Map c.1917

79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 200 400 800 Meters

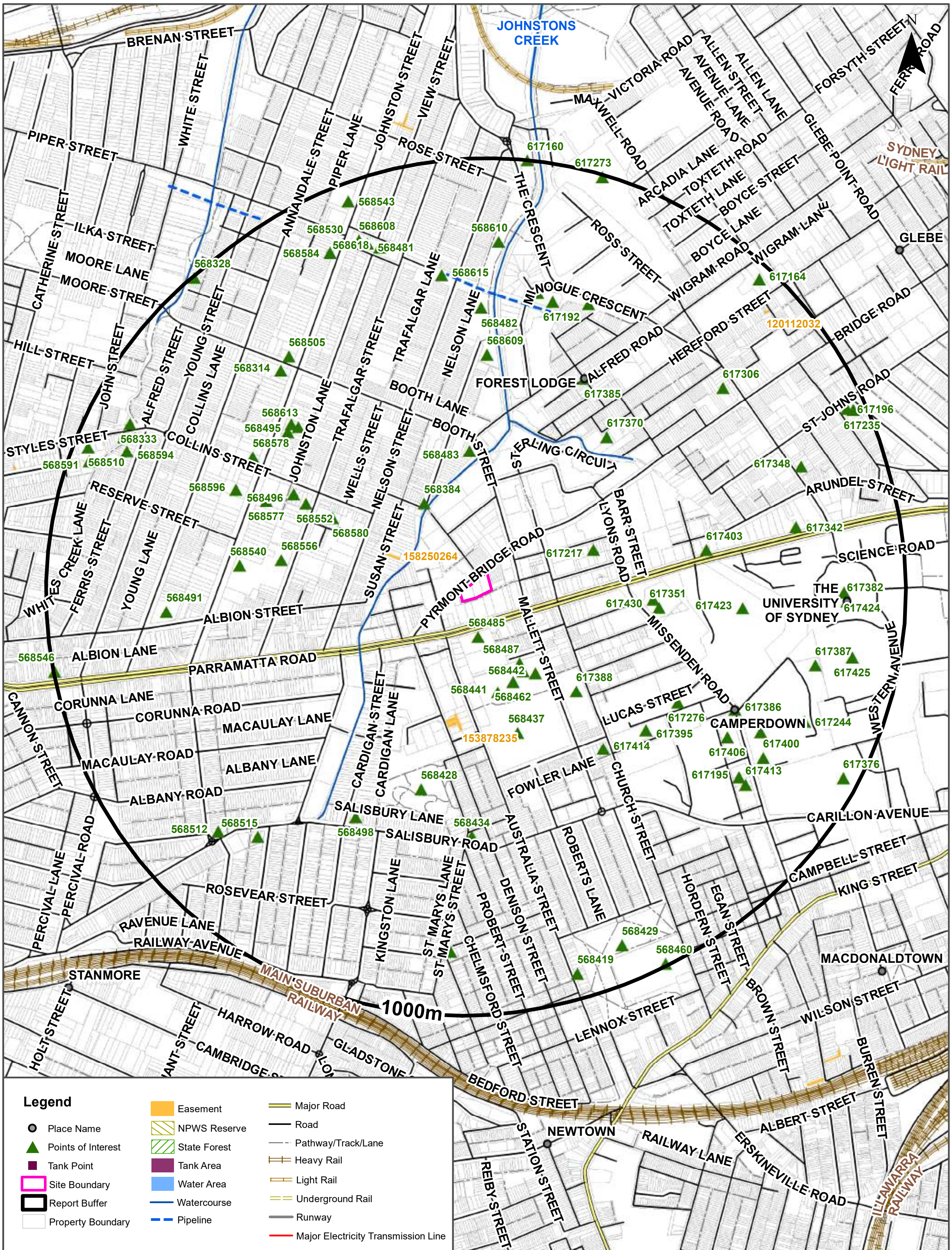
Data Sources: Australia 1:63360
Prepared by Commonwealth Section Imperial General Staff

Coordinate System:
GDA 1994 MGA Zone 56

Date: 11 September 2018

Topographic Features

79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters

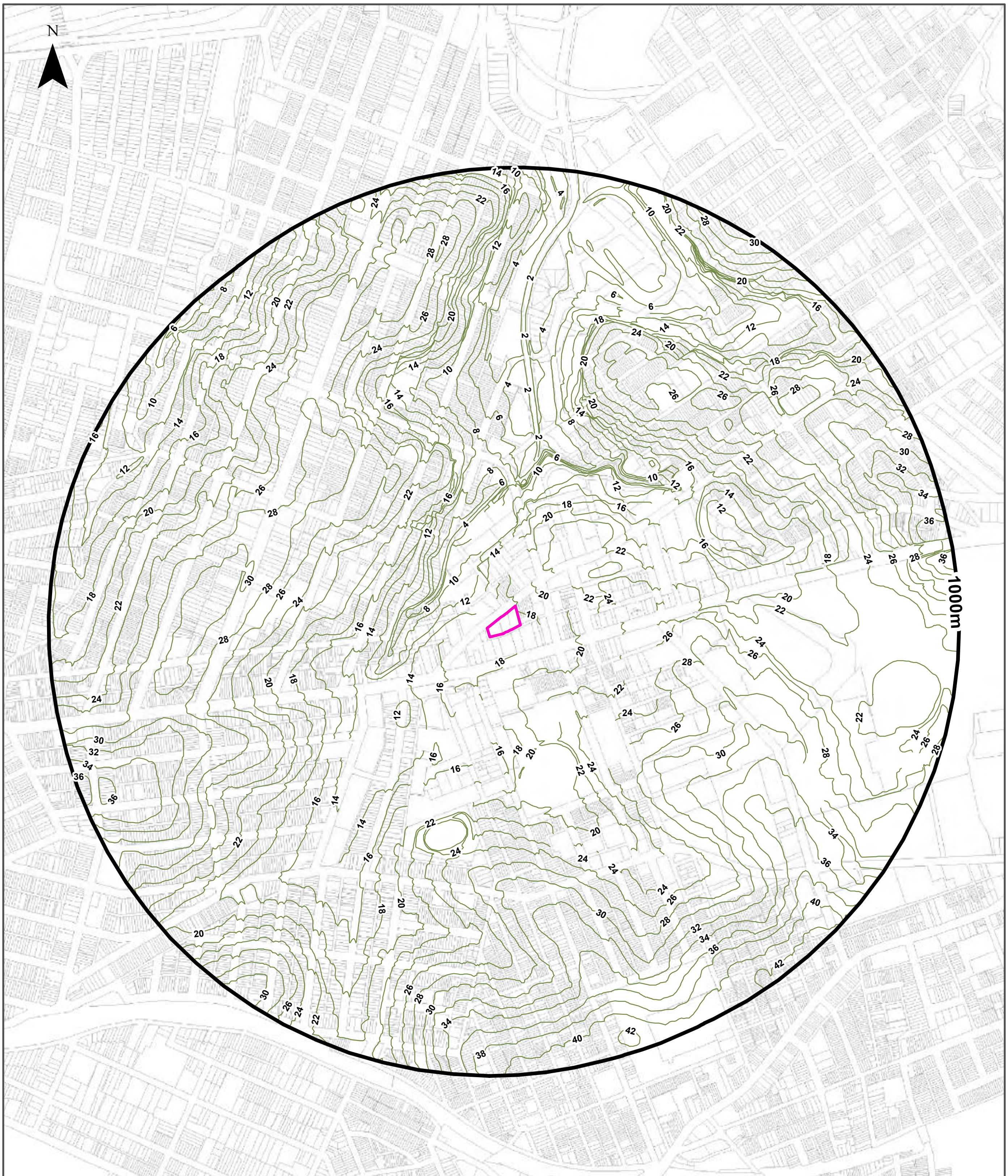
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 12 September 2018

Elevation Contours (m AHD)

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

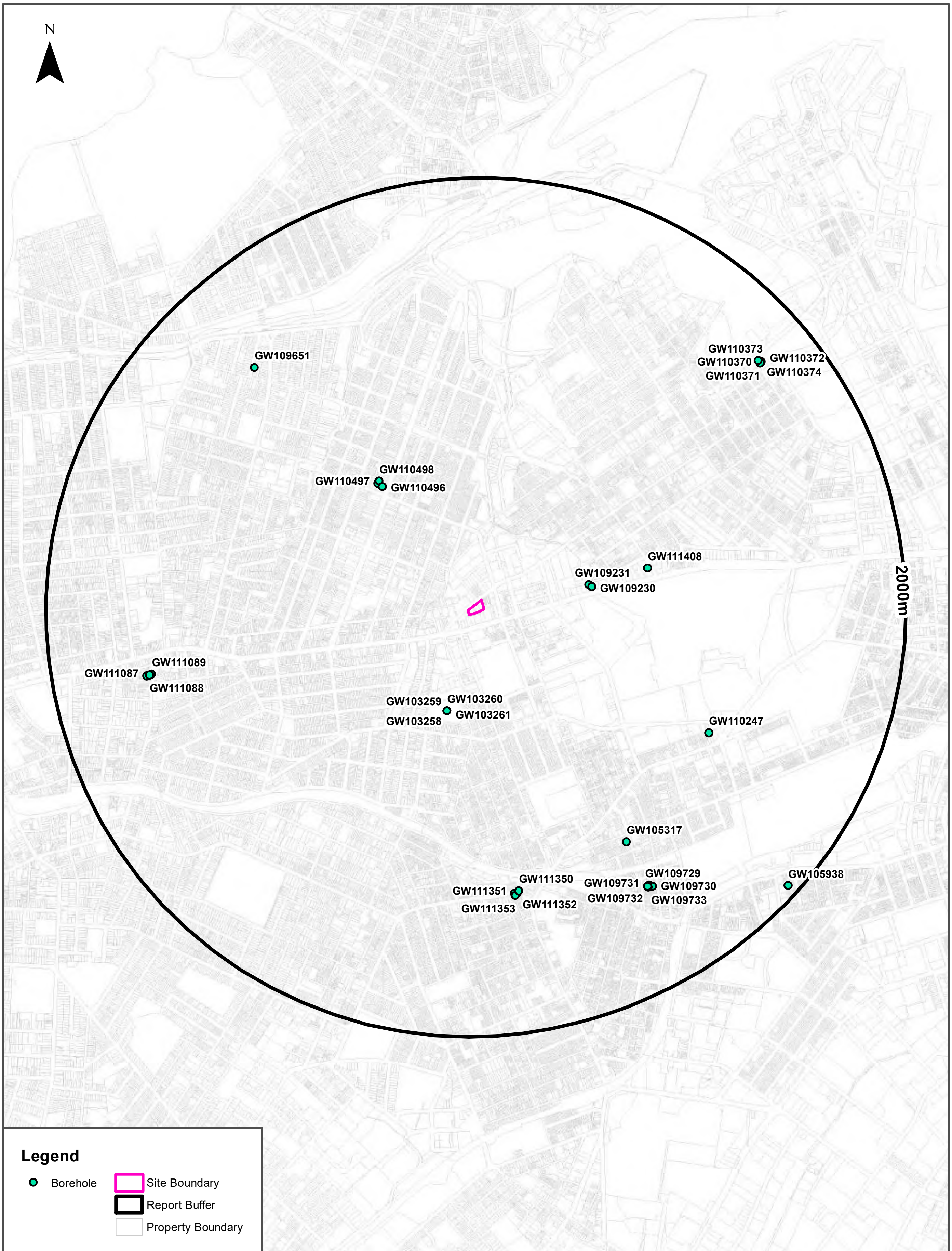
- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Groundwater Boreholes

79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 800 1,000 1,200 Meters

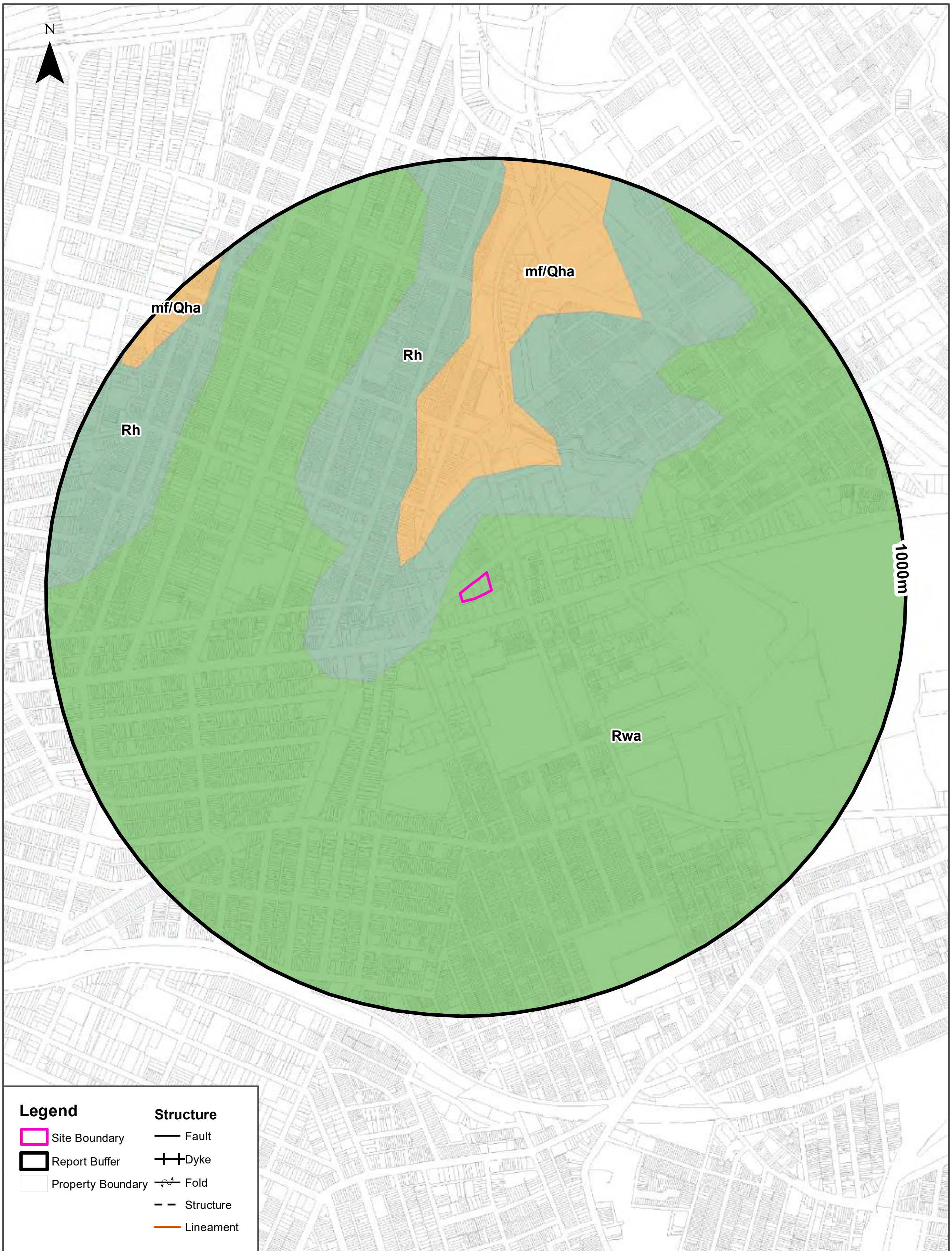
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 12 September 2018

Geology 1:100,000

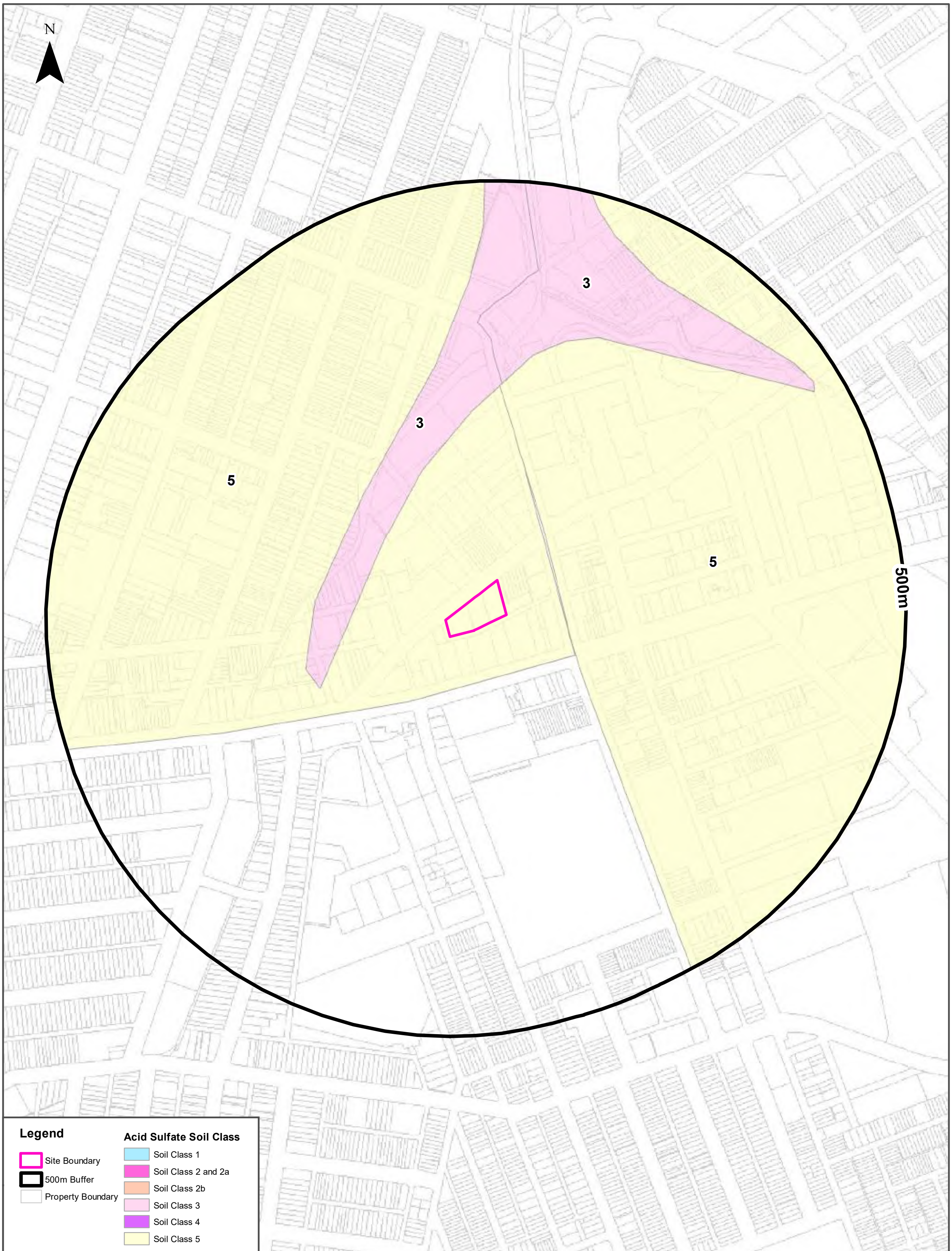
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Acid Sulfate Soils

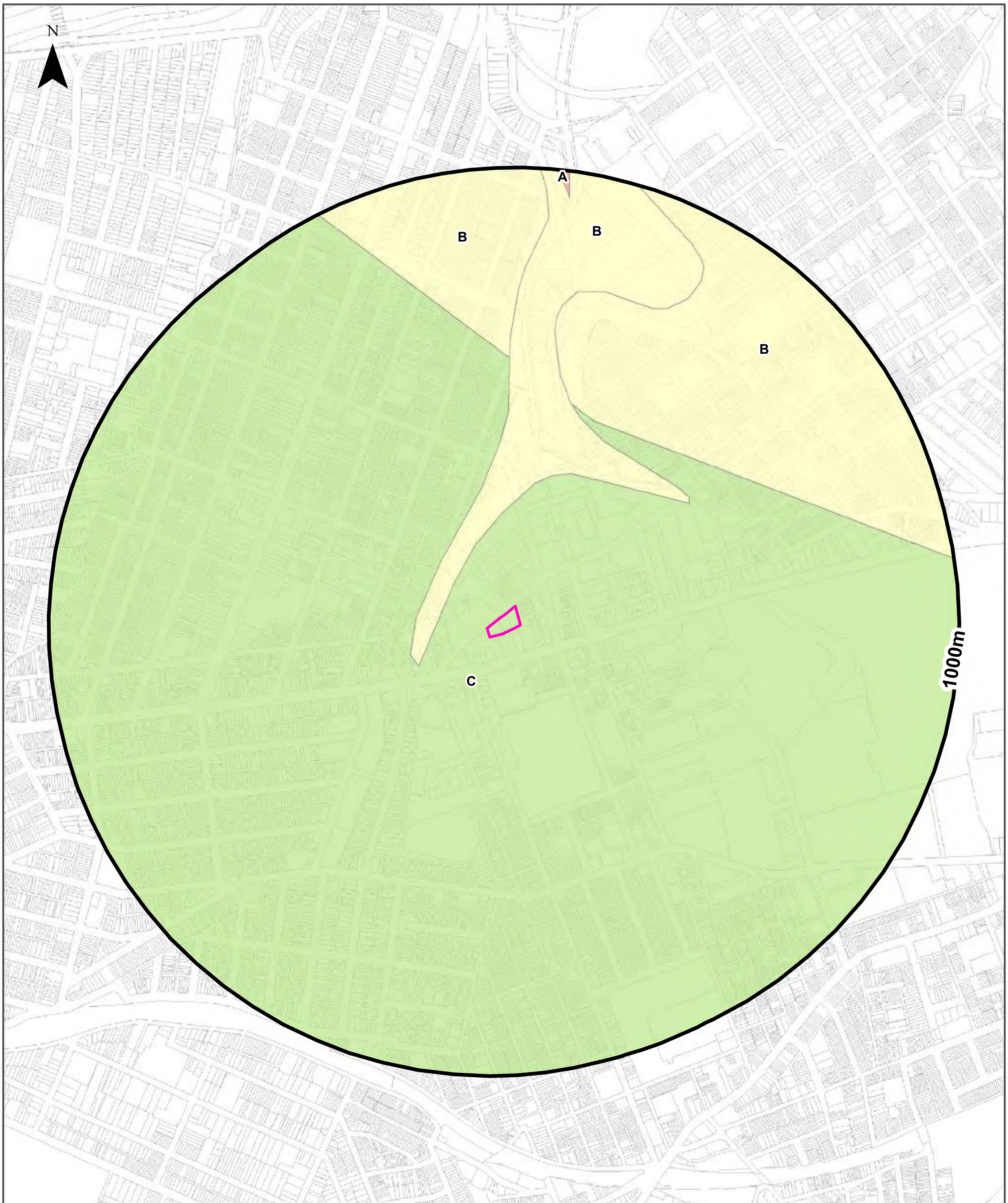
79 Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

Atlas of Australian Acid Sulfate Soils

79 Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary

Report Buffer

Property Boundary

Probability of occurrence of Acid Sulfate Soils

A. High (>70%)

B. Low (6-70%)

C. Extremely Low (1-5%)

D. No Chance (0%)

No Data

Scale: 0 100 200 400 600 Meters

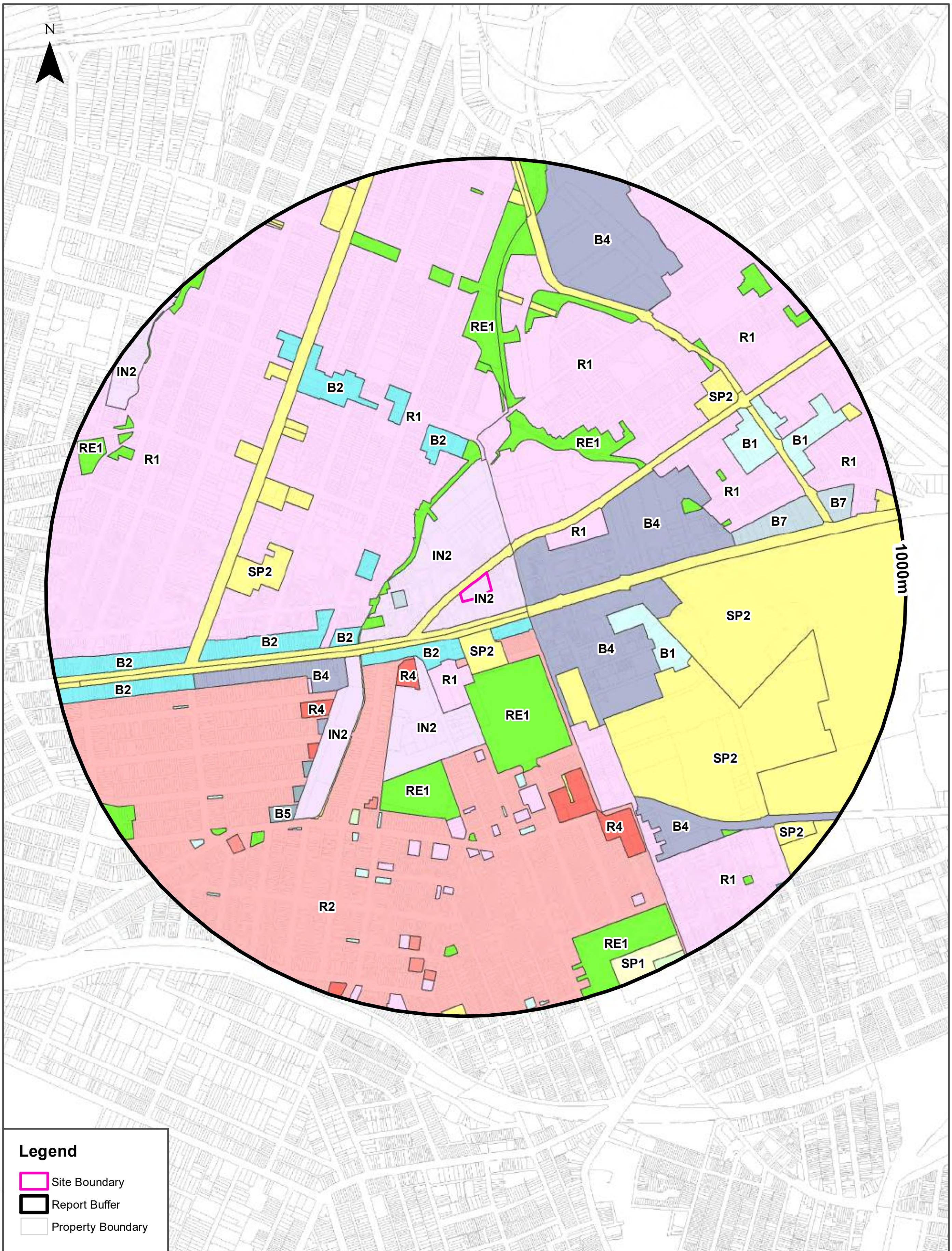
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 12September 2018

LEP Planning Zones

79 Pyrmont Bridge Road, Annandale, NSW 2038

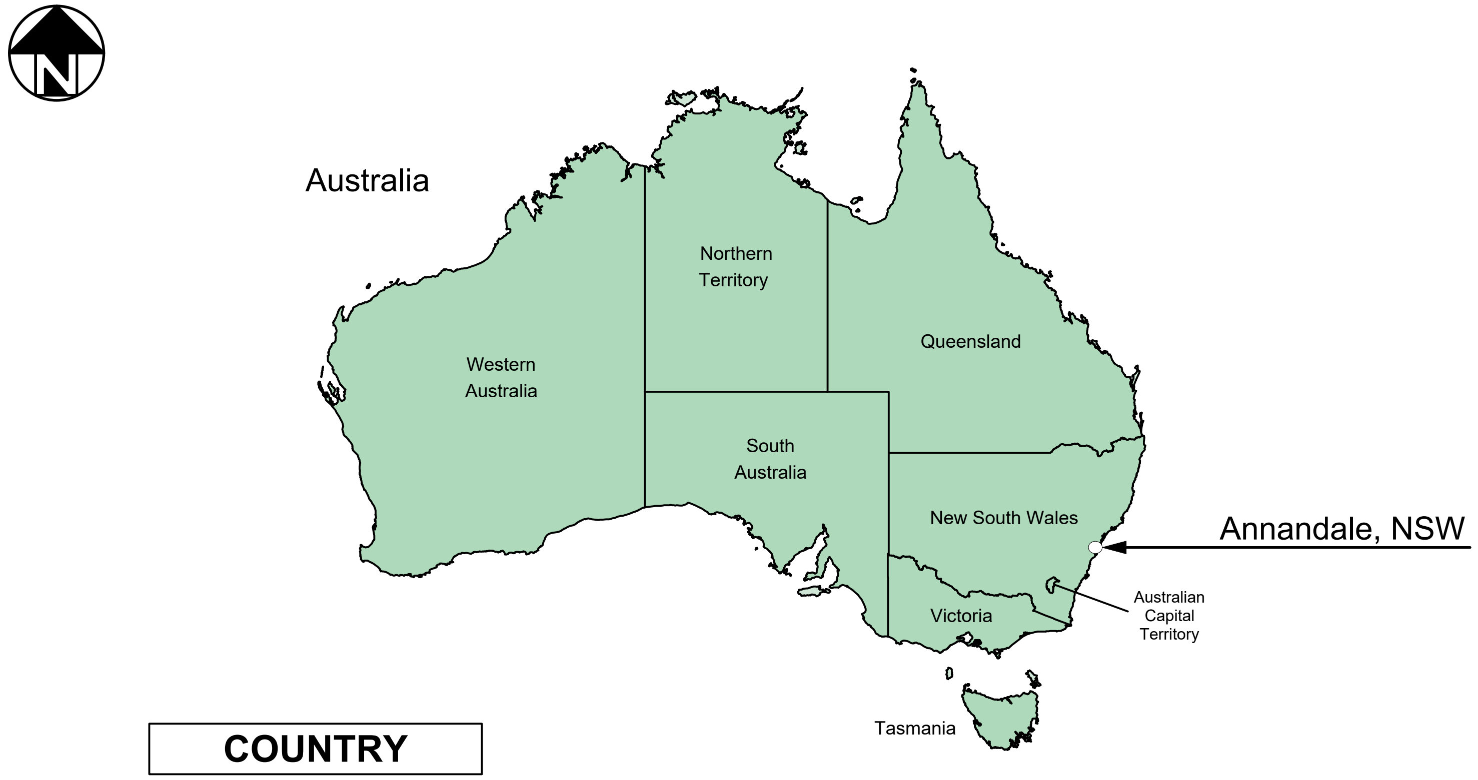


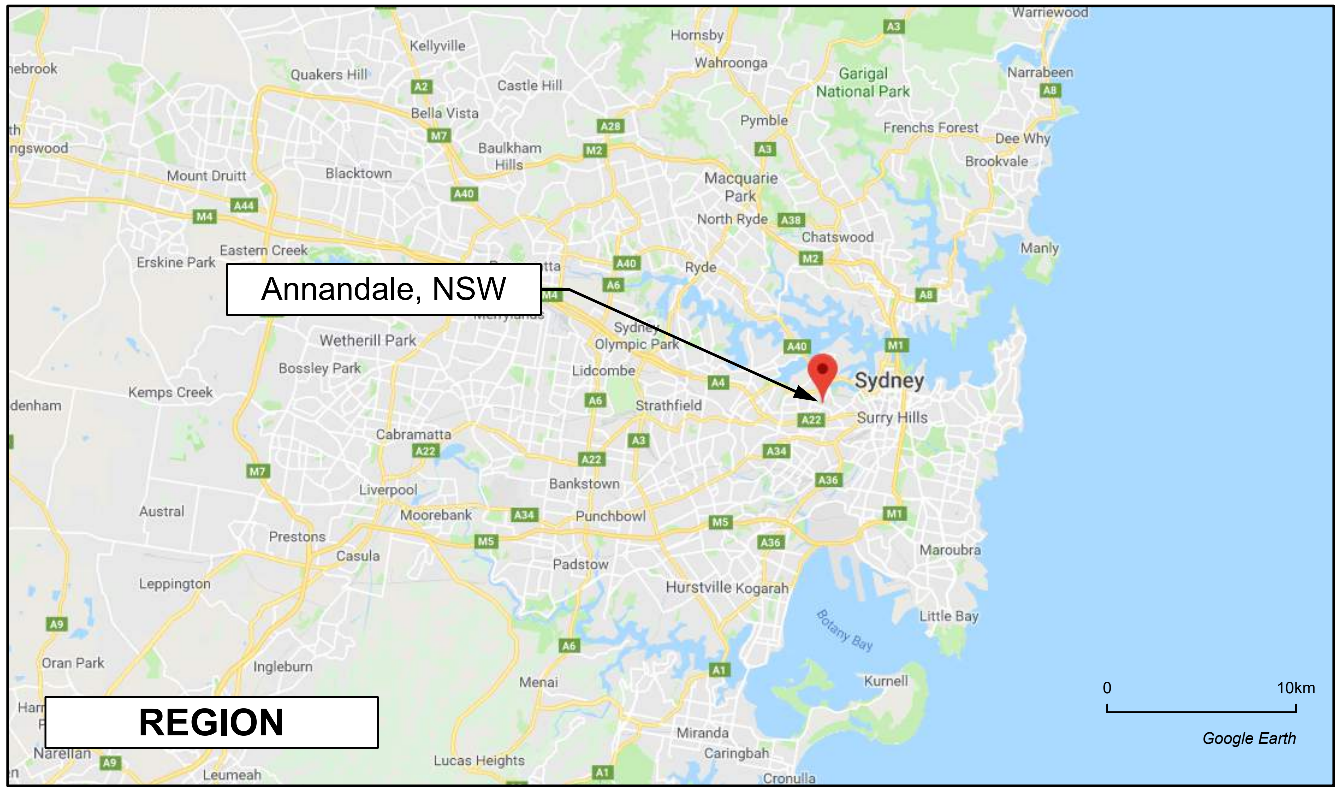
Legend

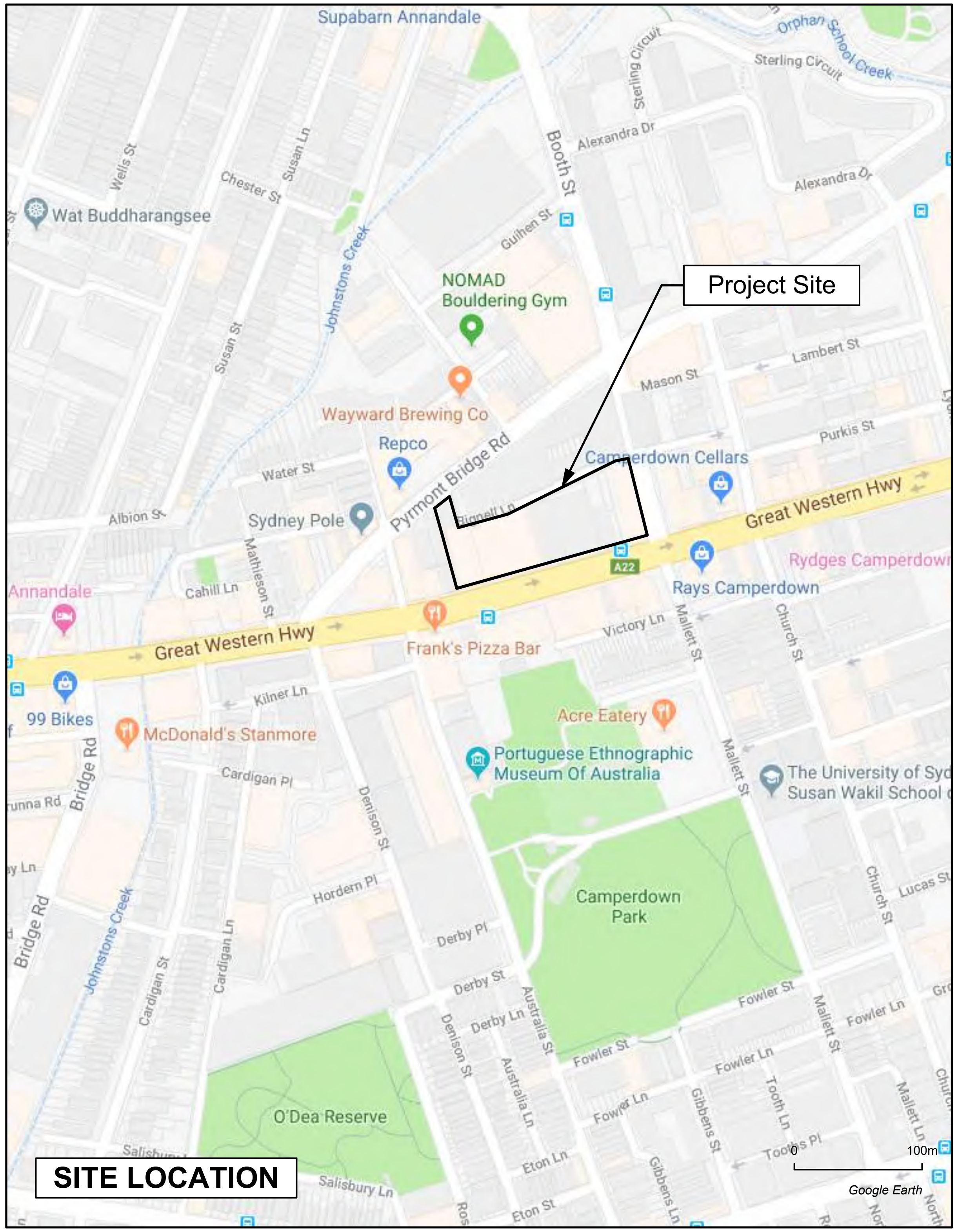
- Site Boundary
- Report Buffer
- Property Boundary

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018 Planning: NSW Crown Copyright - Planning & Environment	Coordinate System: GDA 1994 MGA Zone 56	Date: 12 September 2018

SESL (March 2019)
PSI Stage 2 Area







02	16/11/2018	site boundary changed, typo on F1 corrected	LDW		
01	08/11/2018	initial draft	LDW		
VER	DATE	AMENDMENTS	DRW	CKD	

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SESL AUSTRALIA Environment & Soil Sciences

16 Chilvers Road, Thornleigh NSW 2120 www.sesl.com.au

ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 1
SITE LOCATION

Project Ref:	J001309
Project:	Preliminary Site Investigation
Location:	Stage 2 Pyrmont Bridge Road Site, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331276	Northing: 6248910	Datum mAHD; UTM MGA 56H	PRINT: A3 (L)

VER	DATE	AMENDMENTS	DRW	CKD
02	16/11/2018	site boundary changed, typo on F1 corrected	LDW	
01	08/11/2018	initial draft	LDW	

COMMERCIAL IN CONFIDENCE

SESL AUSTRALIA
Environment & Soil Sciences

16 Chilvers Road, Thornleigh NSW 2120 www.sesl.com.au
ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 2
SITE BOUNDARY

Project Ref:	J001309
Project:	Preliminary Site Investigation
Location:	Stage 2 Pyrmont Bridge Road Site, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331276 | Northing: 6248910 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

J001309 Annandale Figures V2.vwx • Friday, November 16, 2018 3:47:03 PM • drawn by laurie white at www.reumad.com.au

VER	DATE	AMENDMENTS	DRW	CKD

COMMERCIAL IN CONFIDENCE

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ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

Figure 2
Site Layout

Project Ref:	J001309
Project:	PSI - Stage 2 PBR Site, WestConnex M4-M5 Link
Location:	Parramatta Road and Pyrmont Bridge Road, Annandale, NSW, 2038
Client:	Lendlease Samsung Bouygues Joint Venture
GPS Coordinates:	33˚53'11.36" S 151˚10'31.38" E

VER	DATE	AMENDMENTS	DRW	CKD
02	16/11/2018	site boundary changed, typo on F1 corrected	LDW	
01	08/11/2018	initial draft	LDW	

COMMERCIAL IN CONFIDENCE

SESL AUSTRALIA
Environment & Soil Sciences

16 Chilvers Road, Thornleigh NSW 2120 www.sesl.com.au
ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 3
FEATURES OF INTEREST

Project Ref:	J001309
Project:	Preliminary Site Investigation
Location:	Stage 2 Pyrmont Bridge Road Site, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331276 | Northing: 6248910 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

J001309 Annandale Figures V2.vwx • Friday, November 16, 2018 3:47:03 PM • drawn by laurie white at www.reumad.com.au

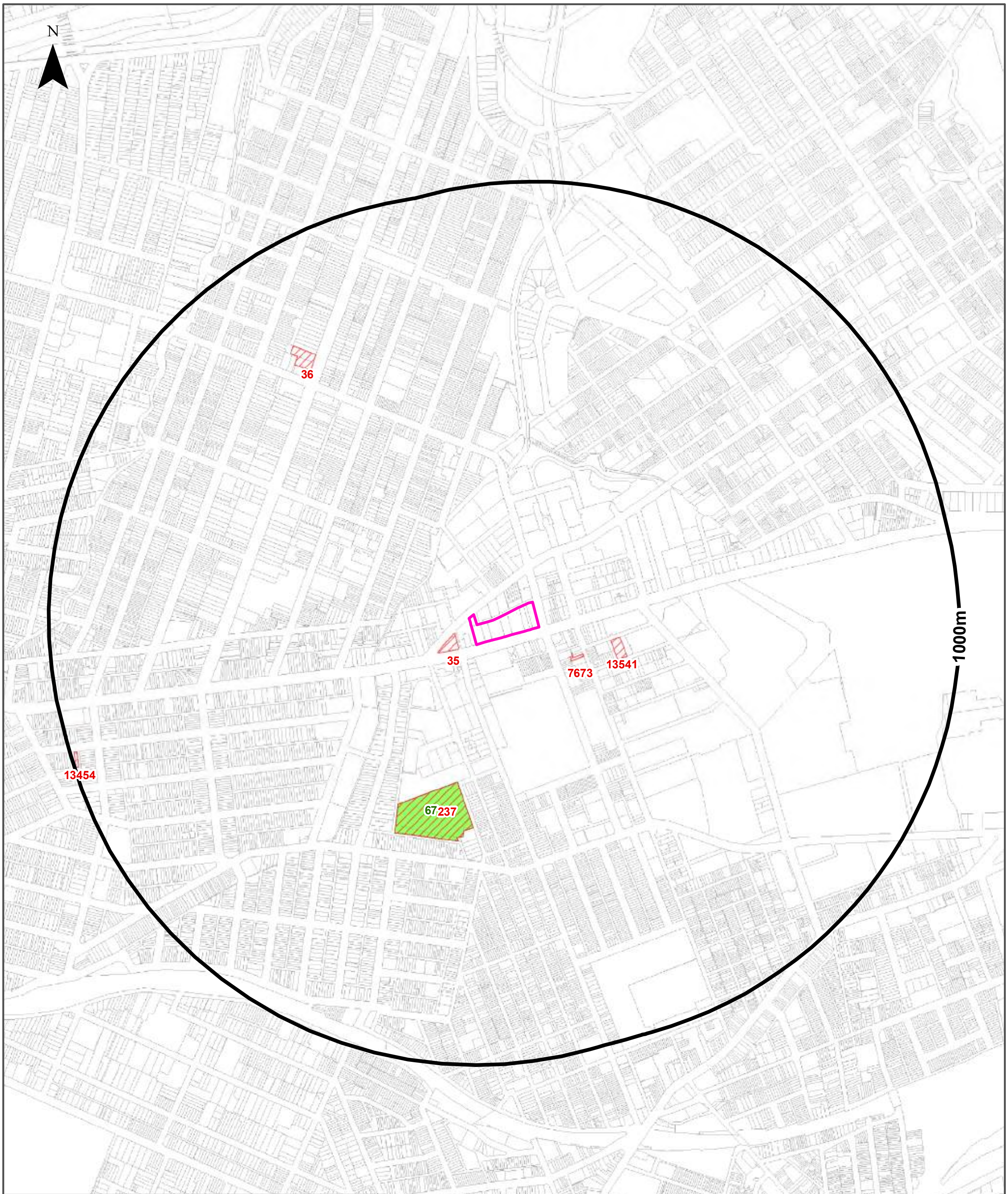
Aerial Imagery 2016

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 50 100 Meters	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Contaminated Land & Waste Management Facilities

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

- Site Boundary
- Report Buffer
- Property Boundary
- Contaminated Land List
- Former Gasworks
- Contaminated Land Record of Notice
- Waste Management Facilities

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Aerial Imagery 2015

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Aerial Imagery 2009

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 2000

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1991

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Legend

- Site Boundary
- Buffer

Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Aerial Imagery 1982

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Aerial Imagery 1970

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

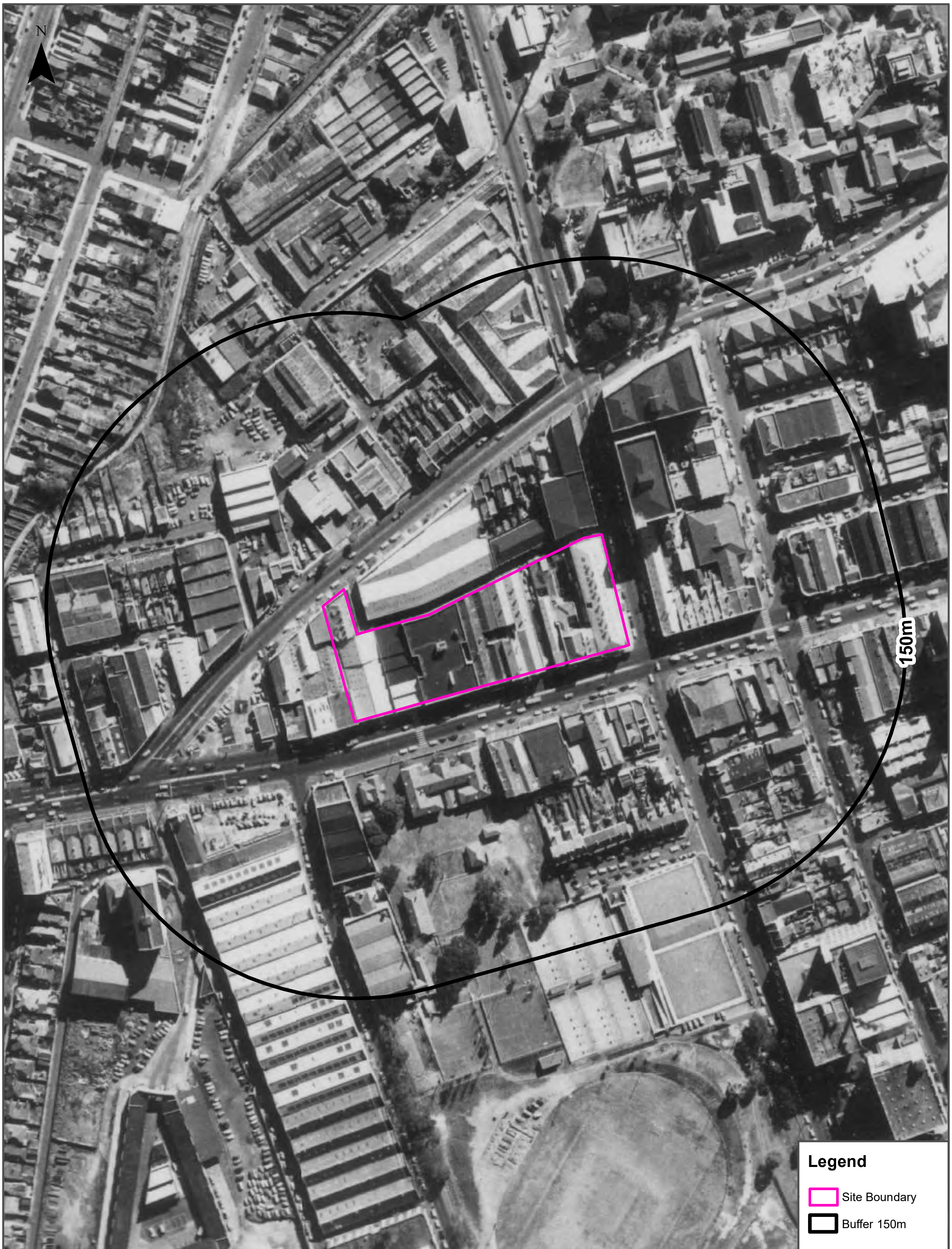
Aerial Imagery 1965

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1961

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

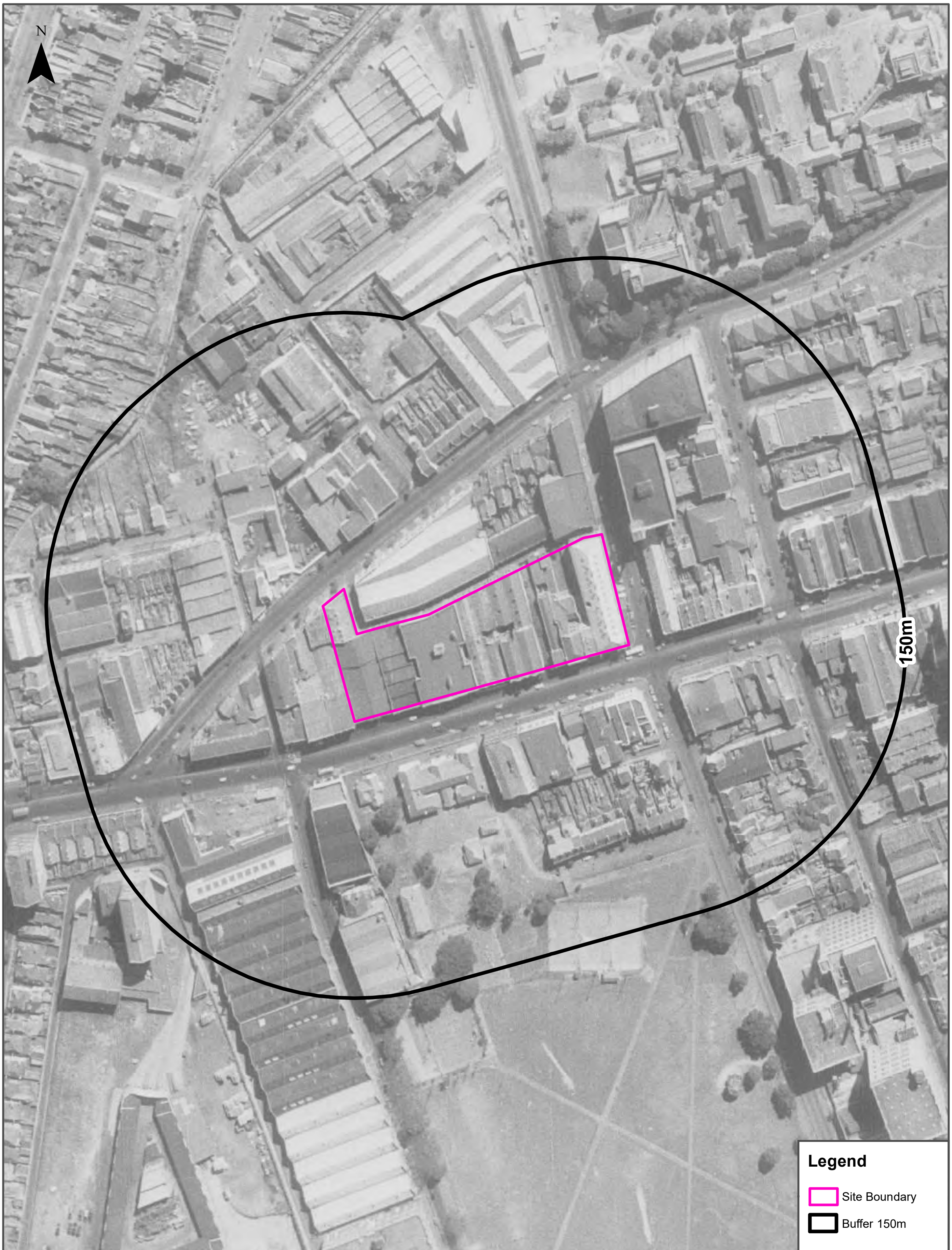
Site Boundary

Buffer 150m

Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1955

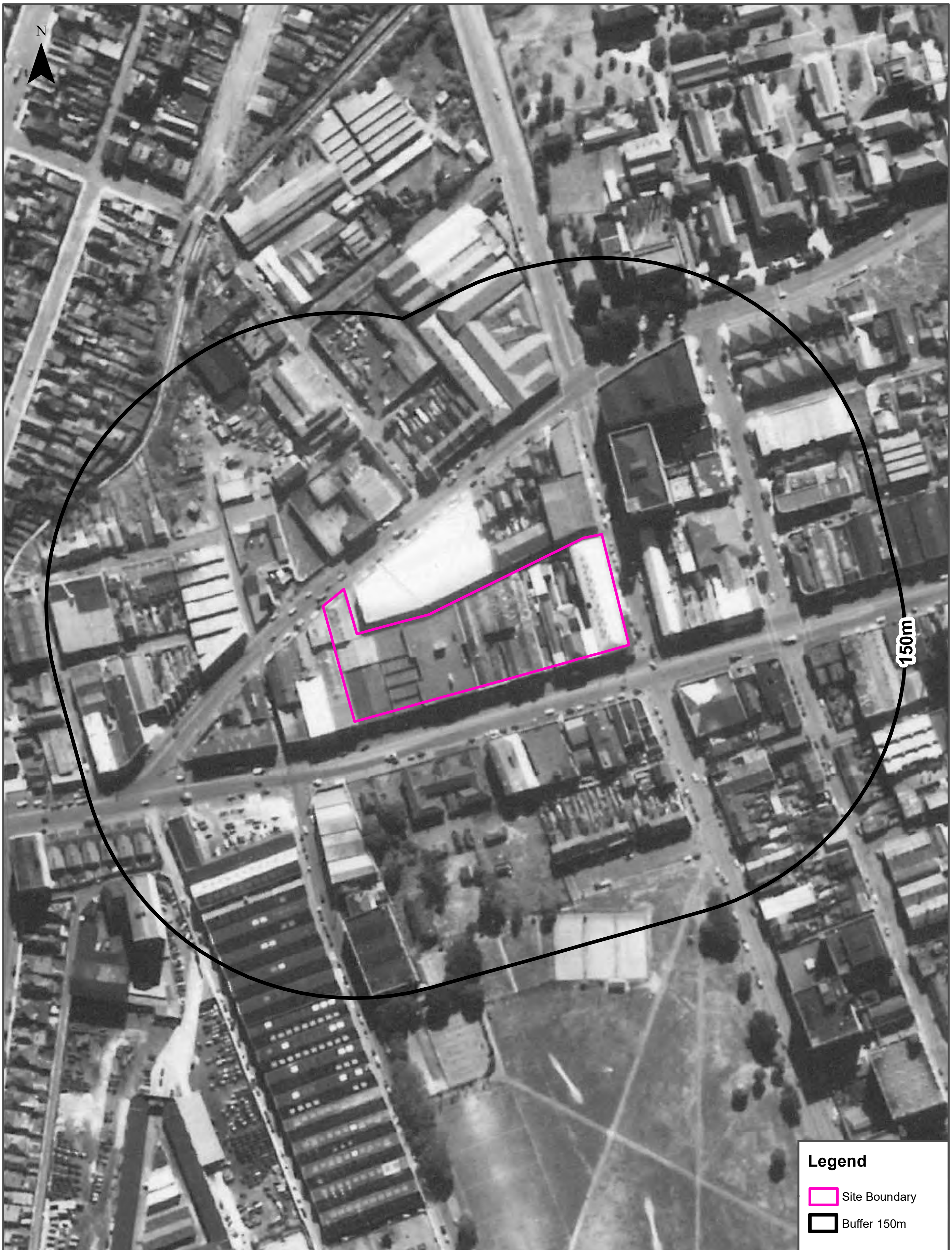
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1951

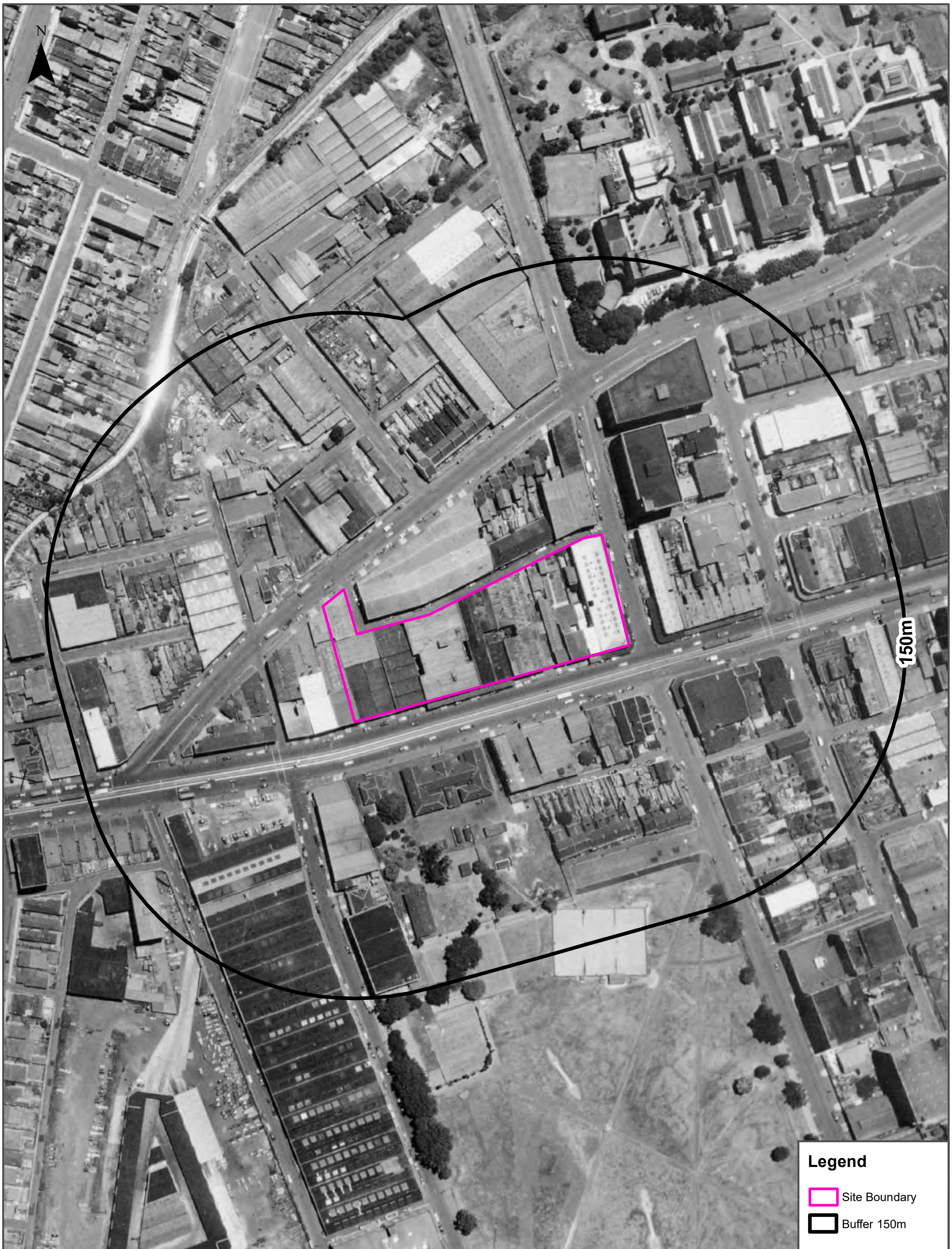
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1949

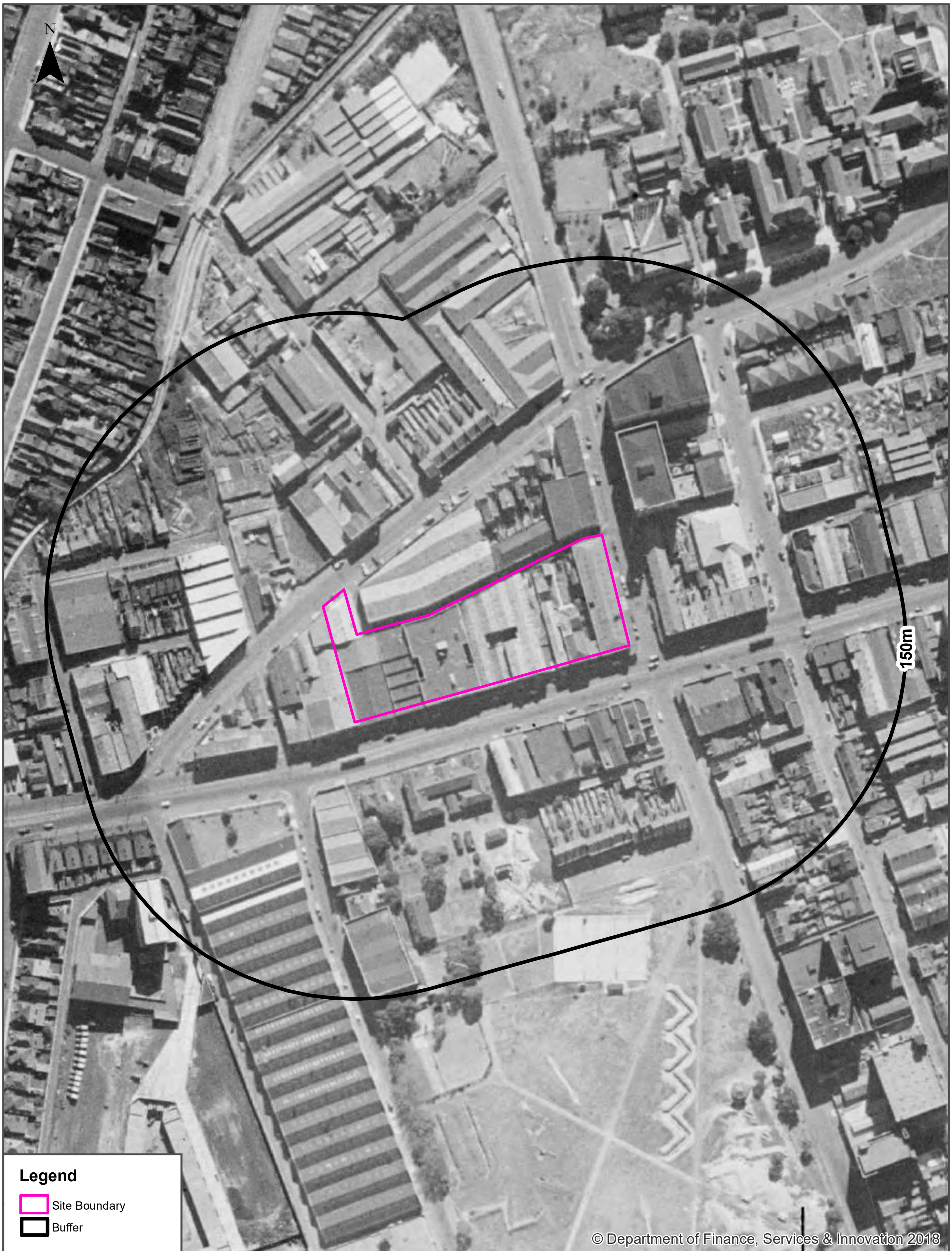
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Aerial Imagery 1943

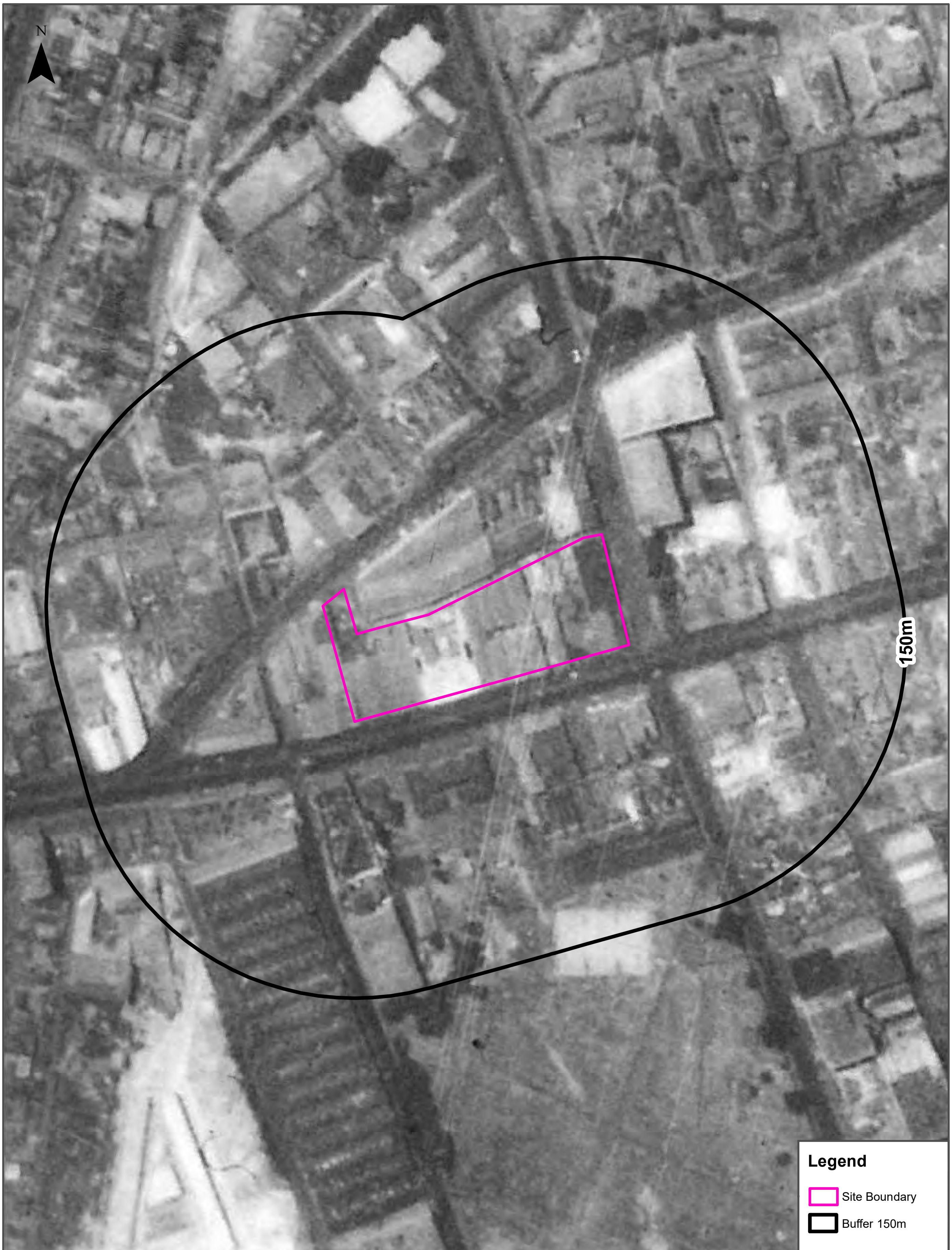
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Sources: Aerial Imagery © Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Aerial Imagery 1930

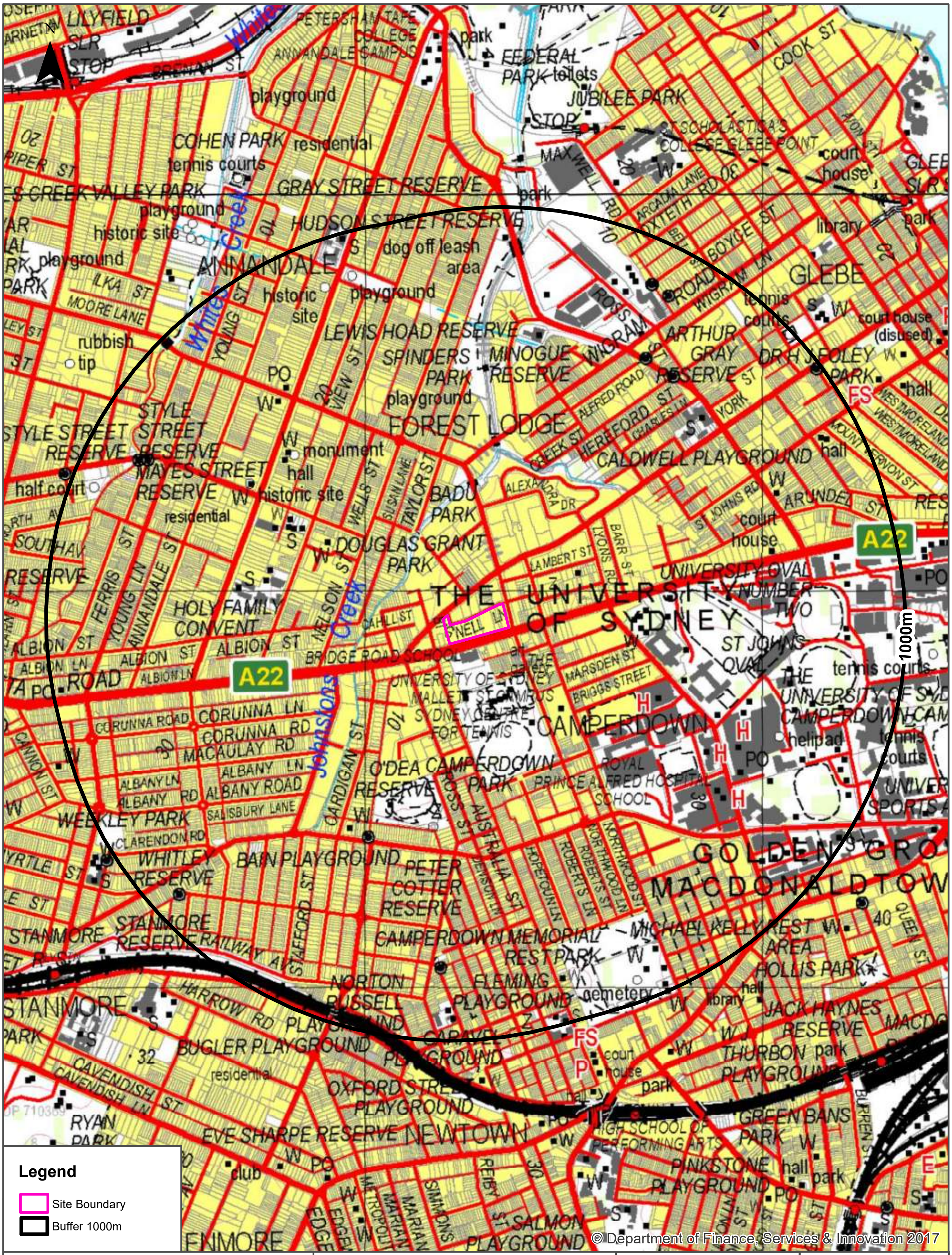
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 25 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 05 October 2018

Topographic Map 2015

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Historical Map 1975

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038

Scale: 0 125 250 500 750 1,000 1,250 Meters

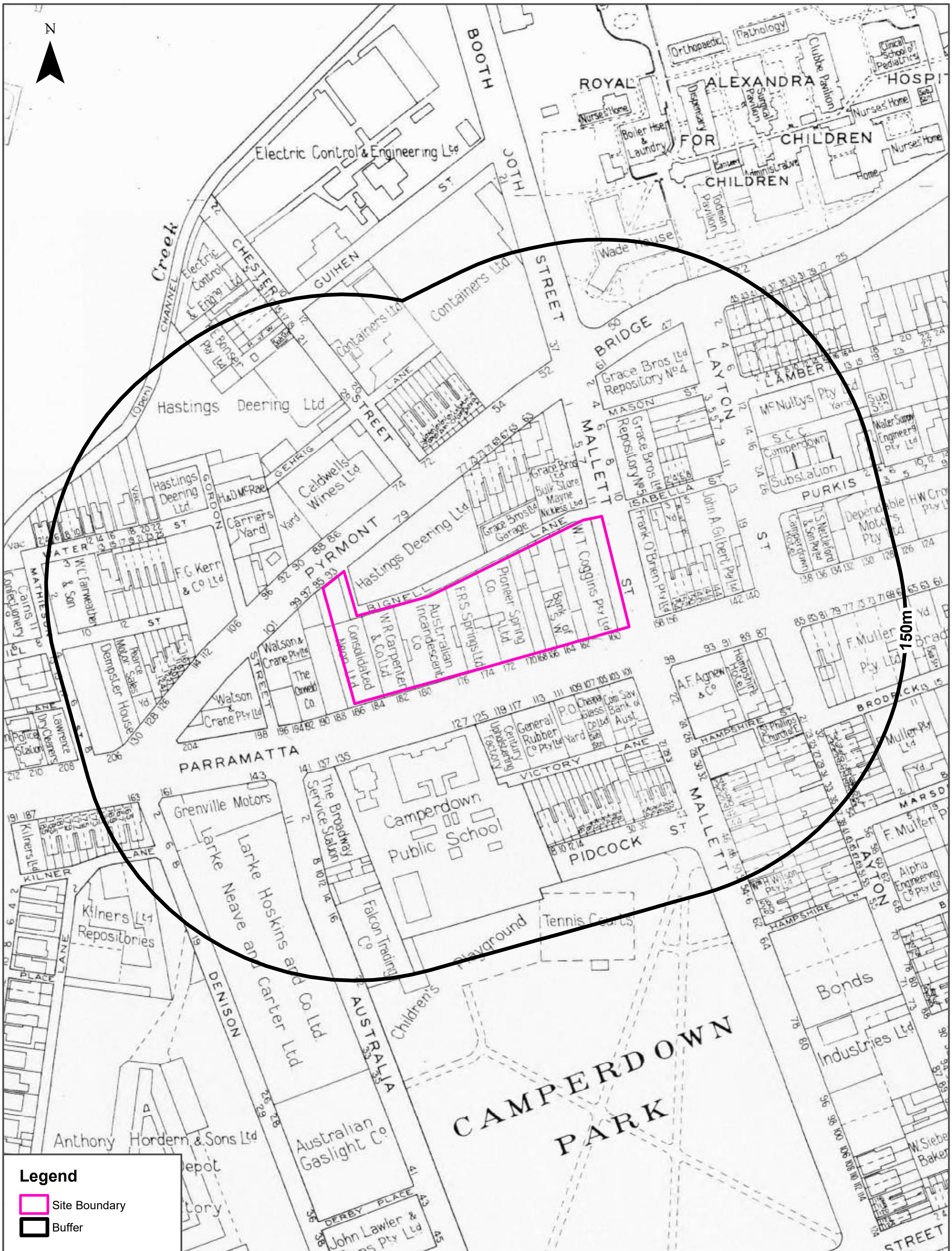
Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia

Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

Historical Map 1956

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



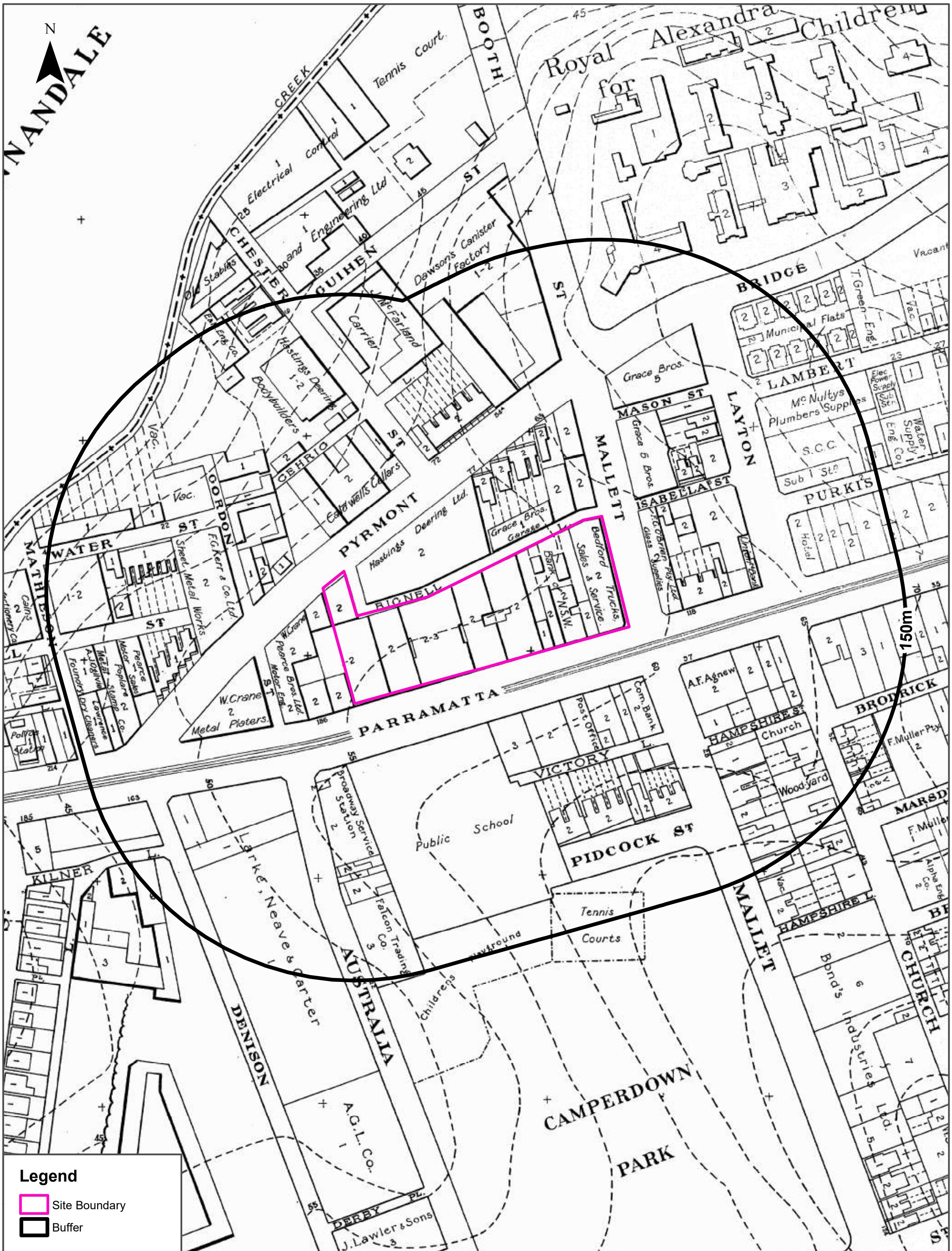
Legend

- Site Boundary
- Buffer

Scale: 0 25 50 100 Meters	Data Sources: City Building Surveyor Sheets Building Regulation Branch - City Building Surveyor's Department, Council of the City of Sydney	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Historical Map 1938-1950

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



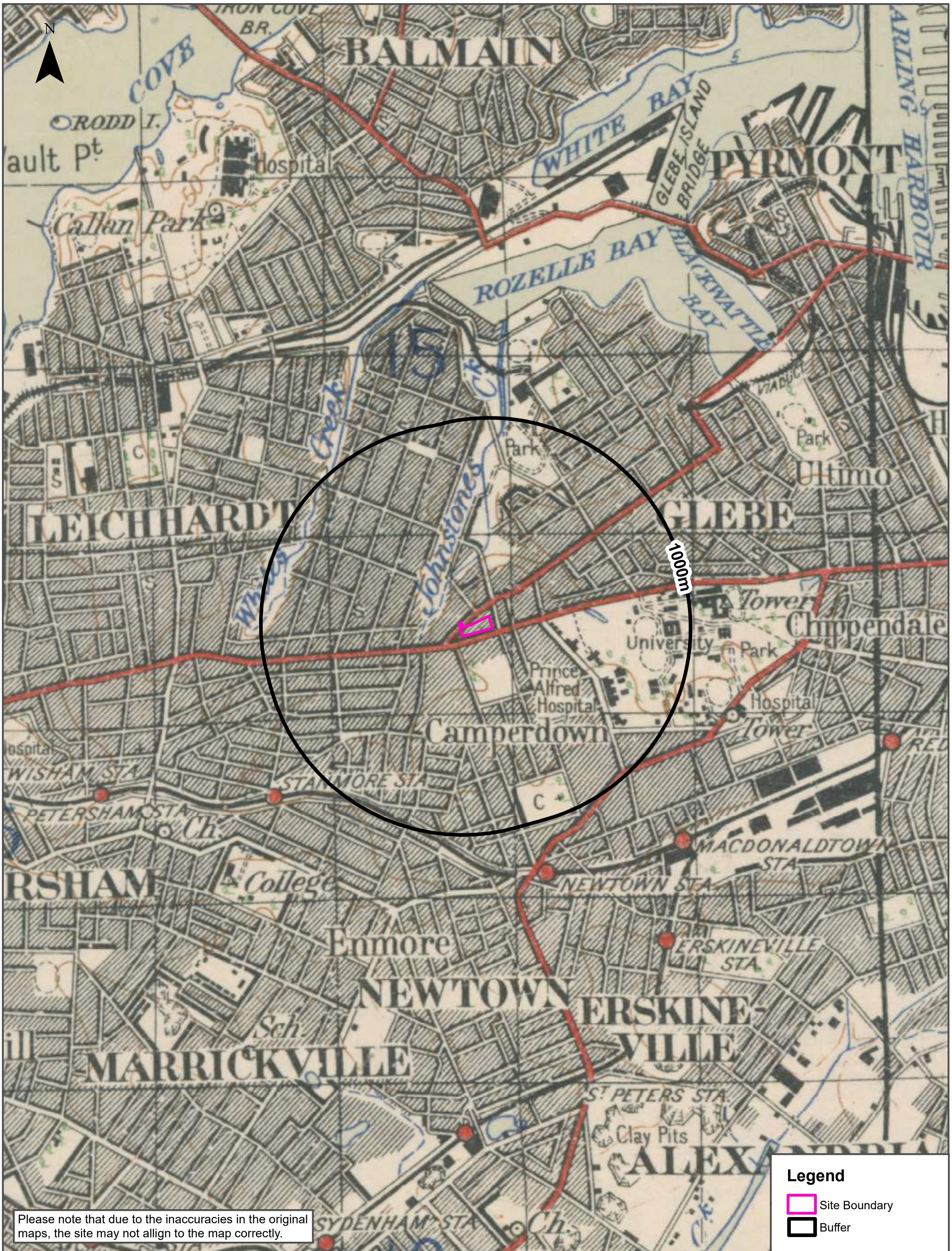
Legend

- Site Boundary
- Buffer

Scale: 0 25 50 100 Meters	Data Sources: Sydney City Civic Survey 1938 - 1950 Town Planning Branch - City Engineers Department, Council of the City of Sydney	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Historical Map 1936

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Please note that due to the inaccuracies in the original maps, the site may not allign to the map correctly.

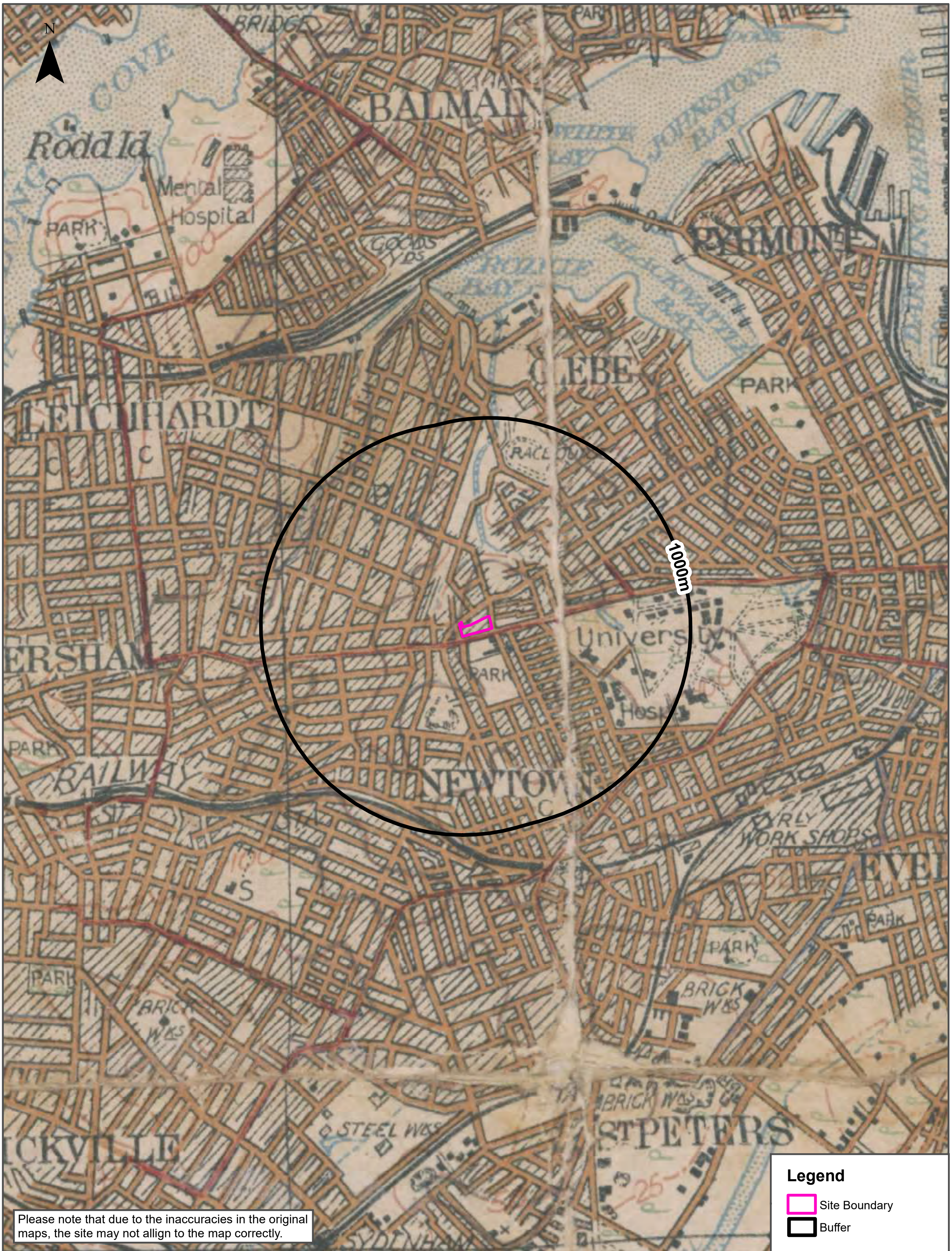
Legend

- Site Boundary
- Buffer

Scale: 0 125 250 500 750 1,000 1,250 Meters	Data Sources: Australia 1:63360, Produced by Australian Section Imperial General Staff	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Historical Map 1917

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 125 250 500 750 1,000 1,250 Meters

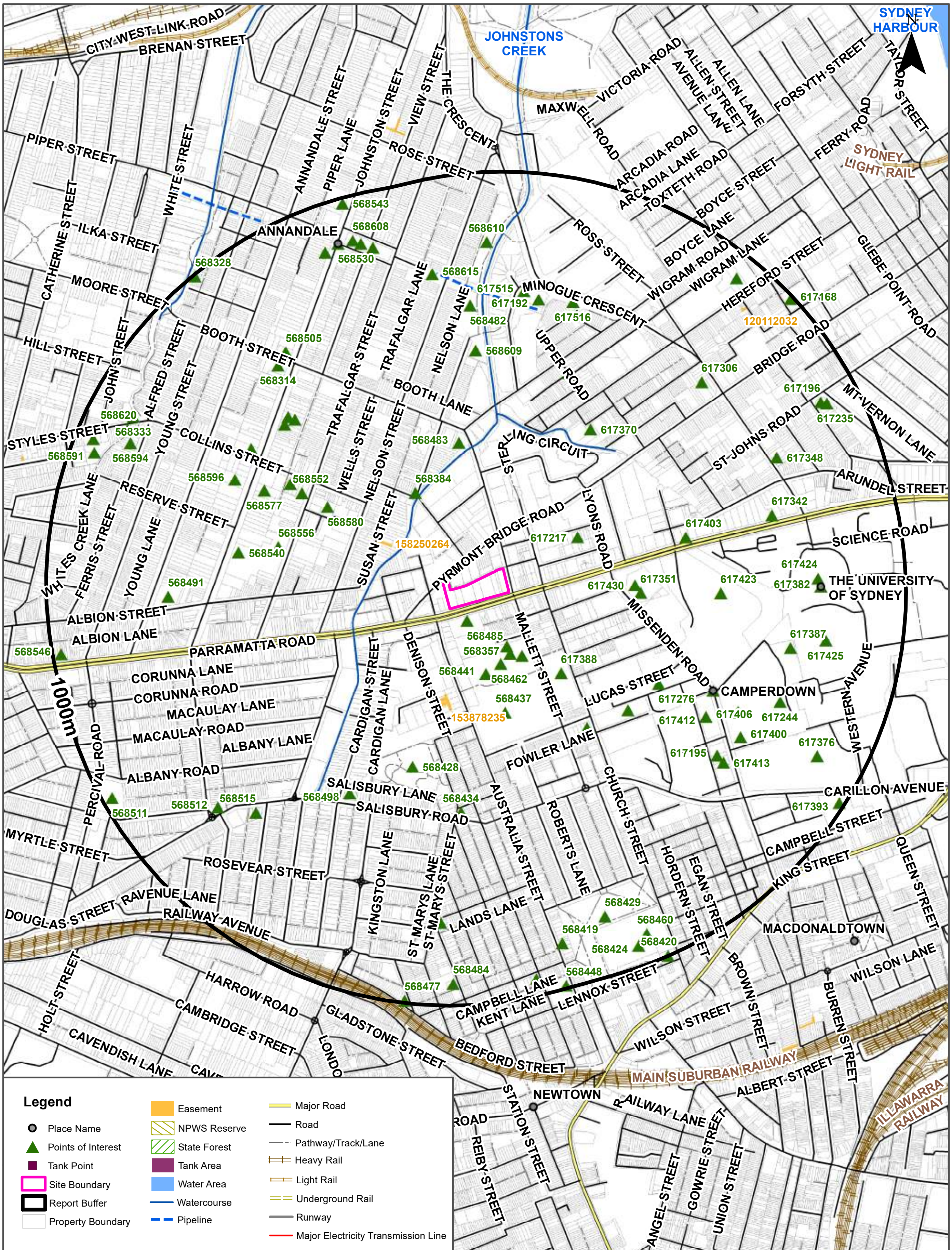
Data Sources: Australia 1:63360, Produced by Australian Section Imperial General Staff

Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

Topographic Features

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters

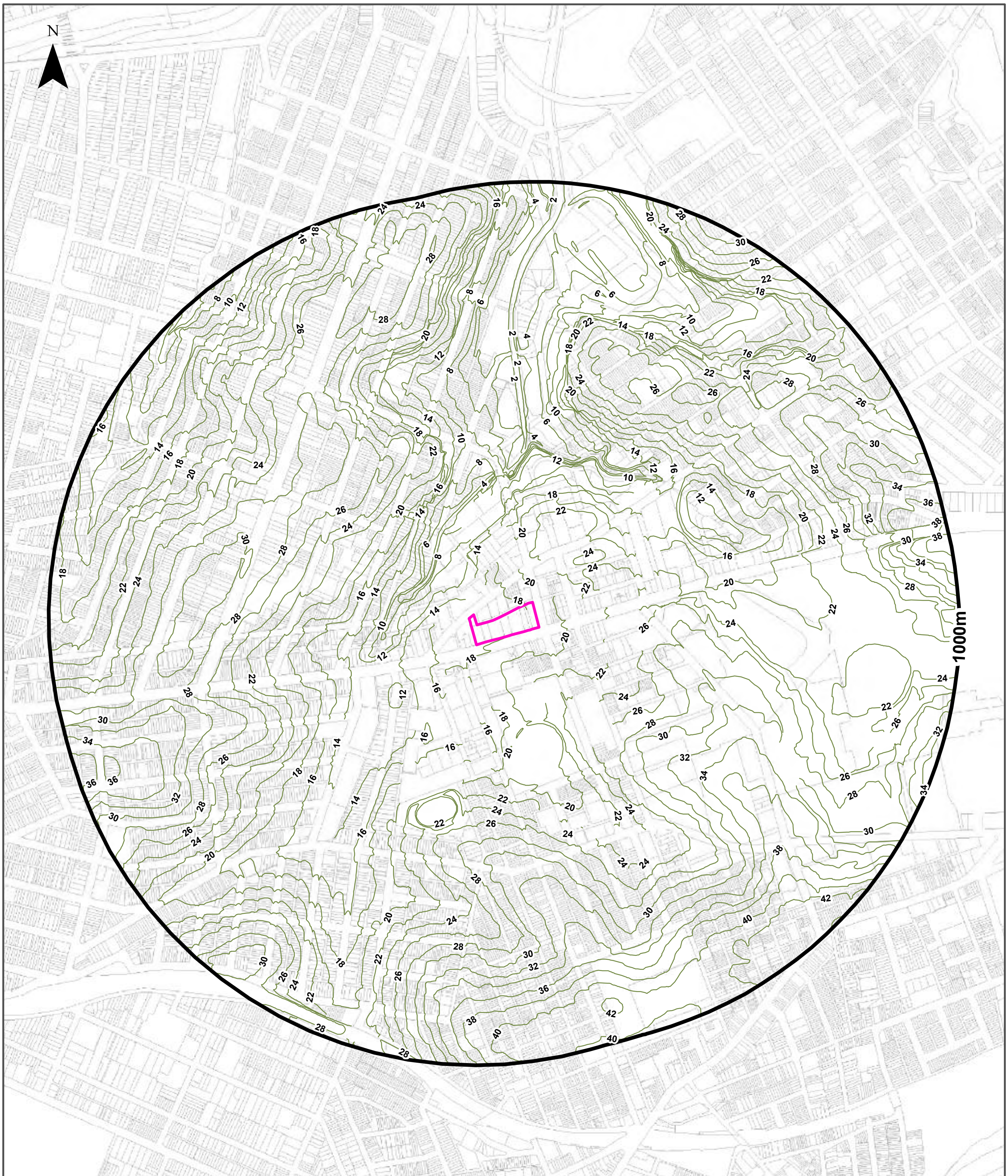
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

Elevation Contours (m AHD)

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters

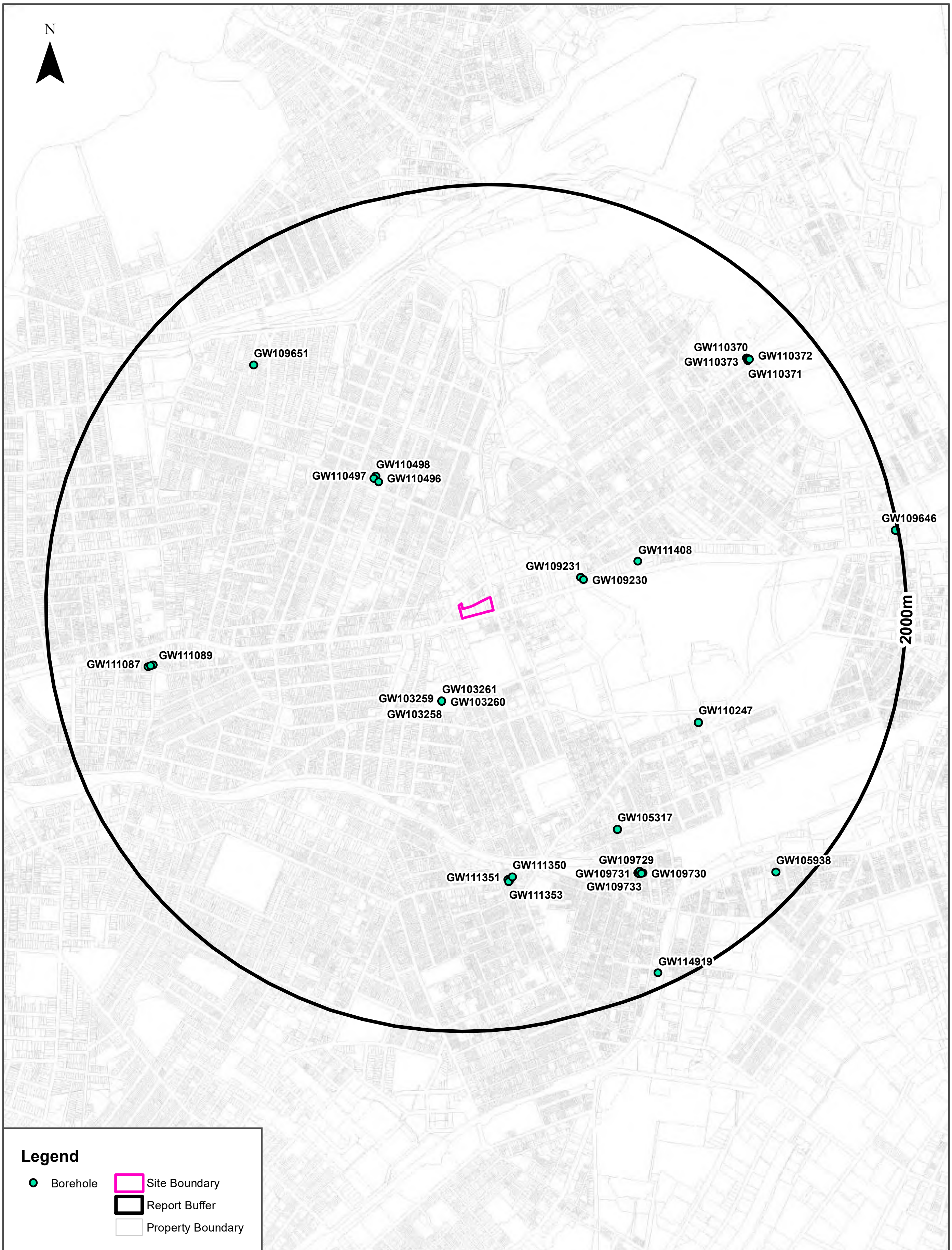
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

Groundwater Boreholes

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 800 1,000 1,200 Meters

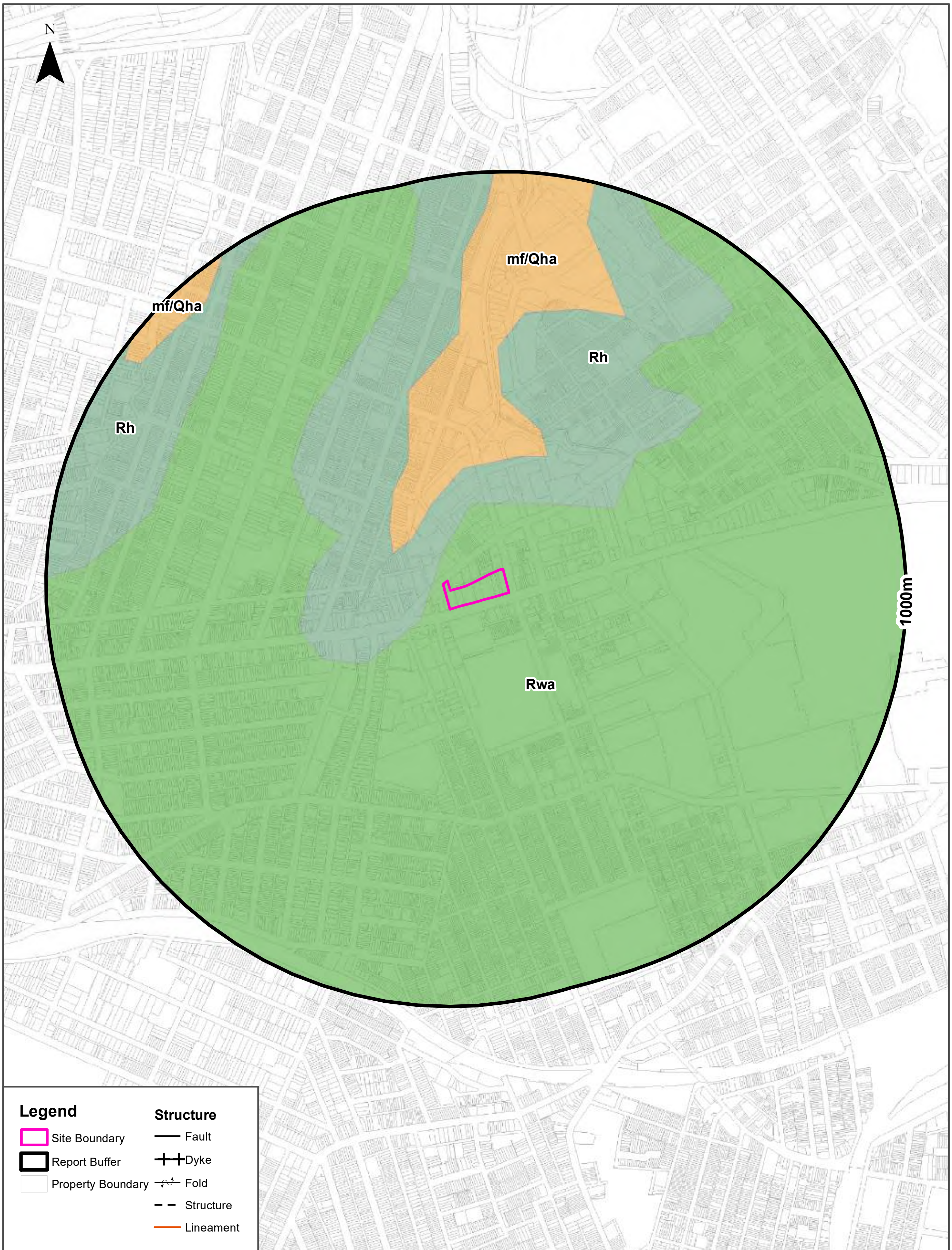
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

Geology 1:100,000

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary
Report Buffer
Property Boundary

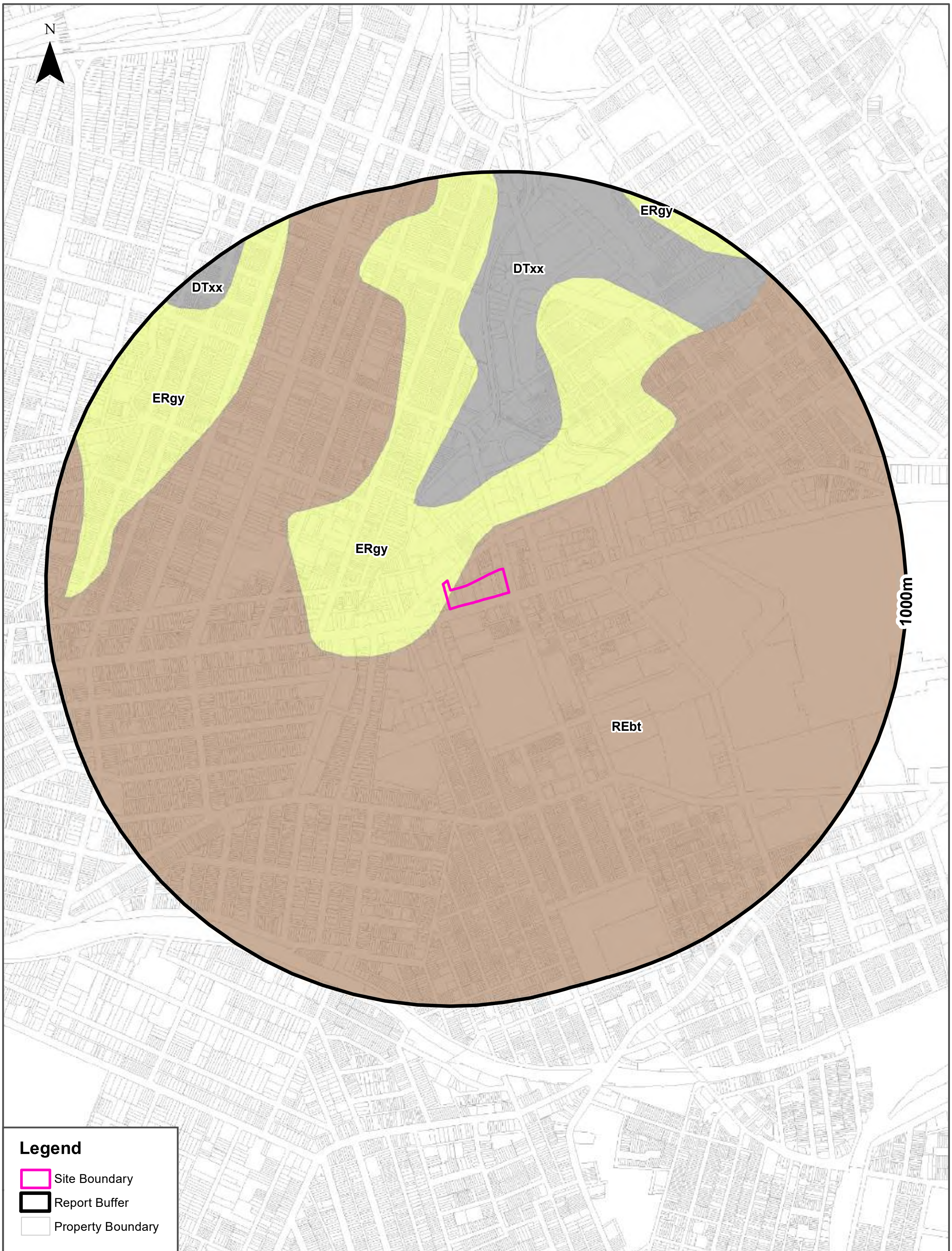
Structure

Fault
Dyke
Fold
Structure
Lineament

Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Soil Landscapes

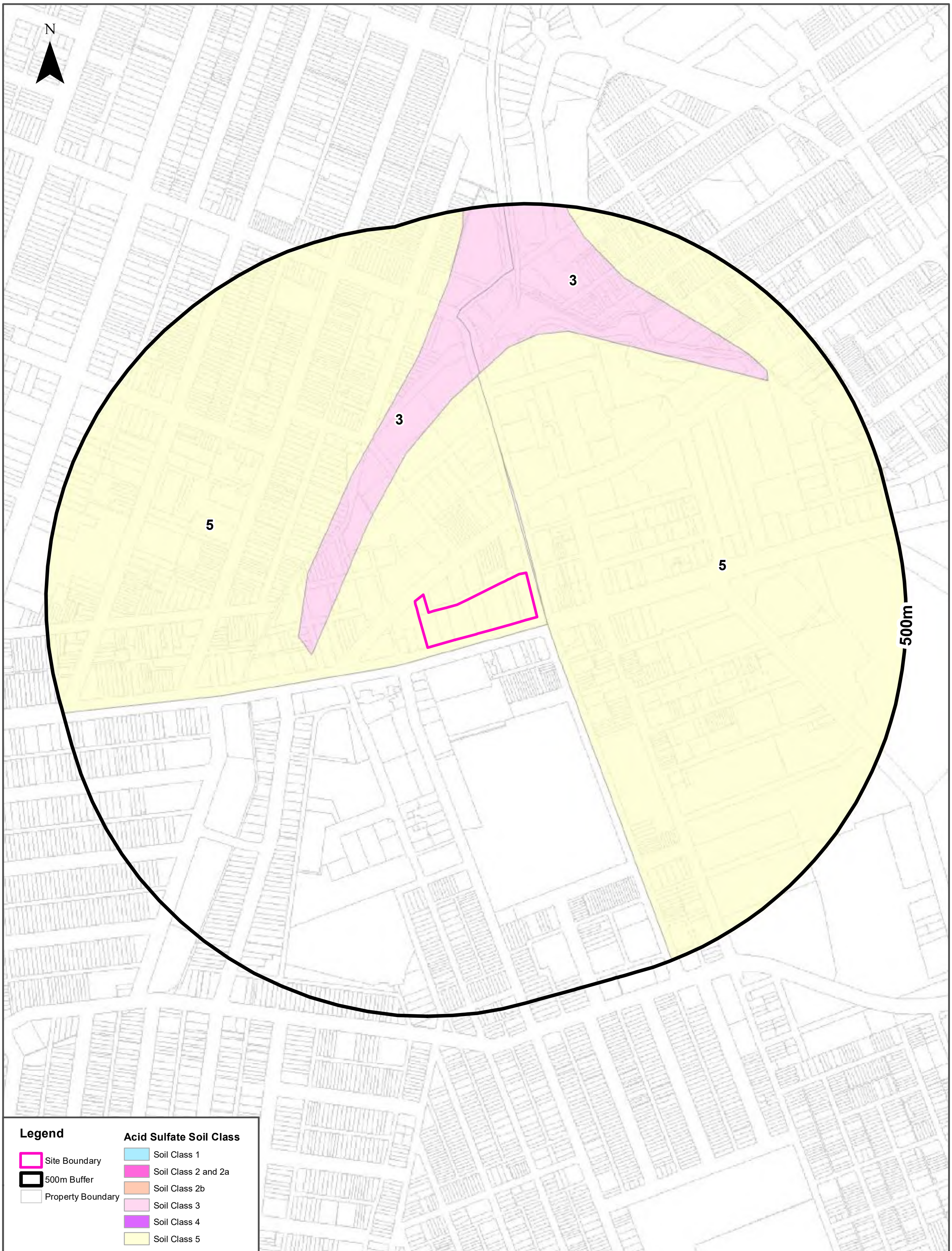
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Acid Sulfate Soils

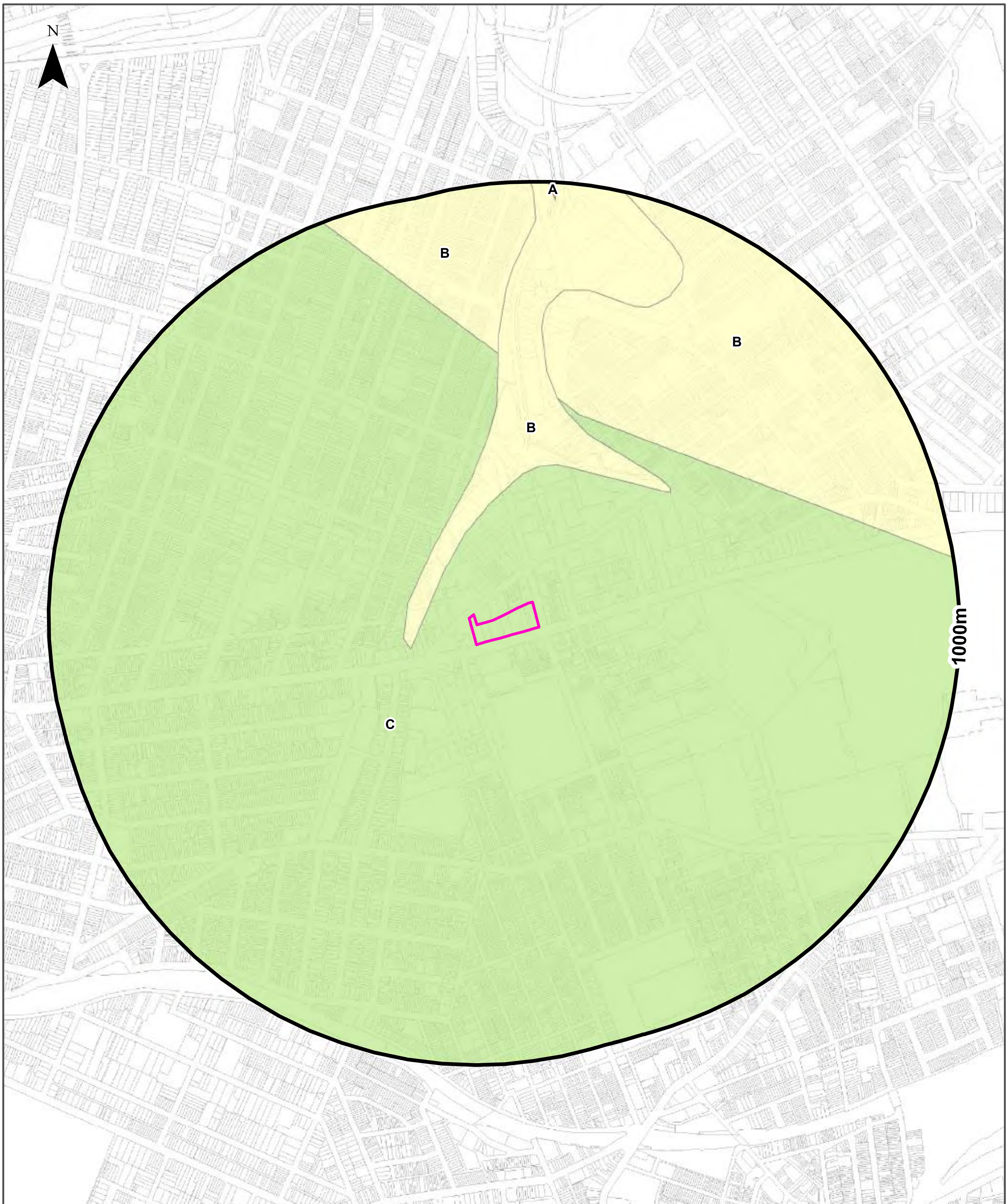
Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Scale: 0 100 200 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 08 October 2018

Atlas of Australian Acid Sulfate Soils

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary

Report Buffer

Property Boundary

Probability of occurrence of Acid Sulfate Soils

A. High (>70%)

B. Low (6-70%)

C. Extremely Low (1-5%)

D. No Chance (0%)

No Data

Scale: 0 100 200 400 600 Meters

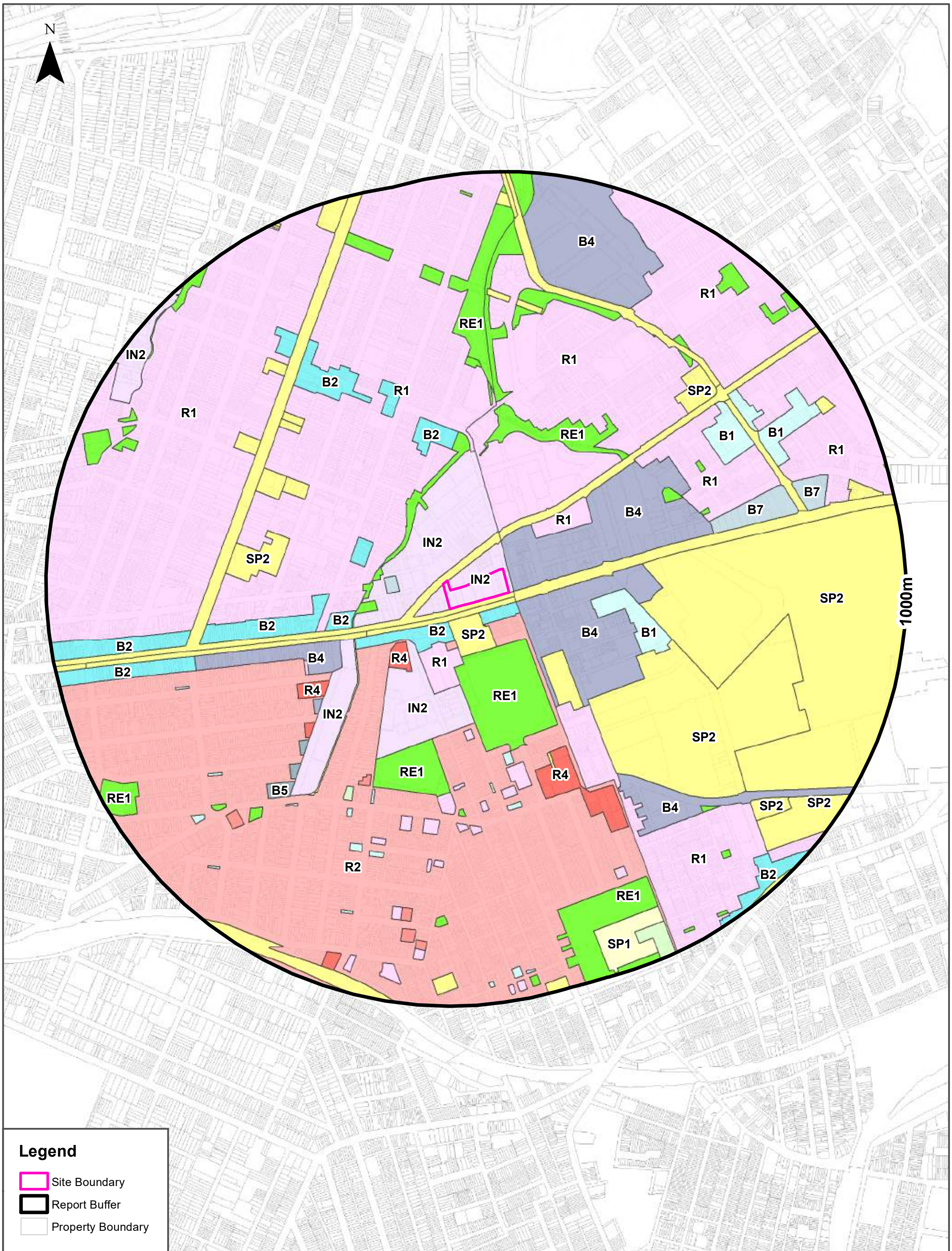
Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 08October 2018

LEP Planning Zones

Stage 2, Pyrmont Bridge Road, Annandale, NSW 2038



Legend

Site Boundary

Report Buffer

Property Boundary

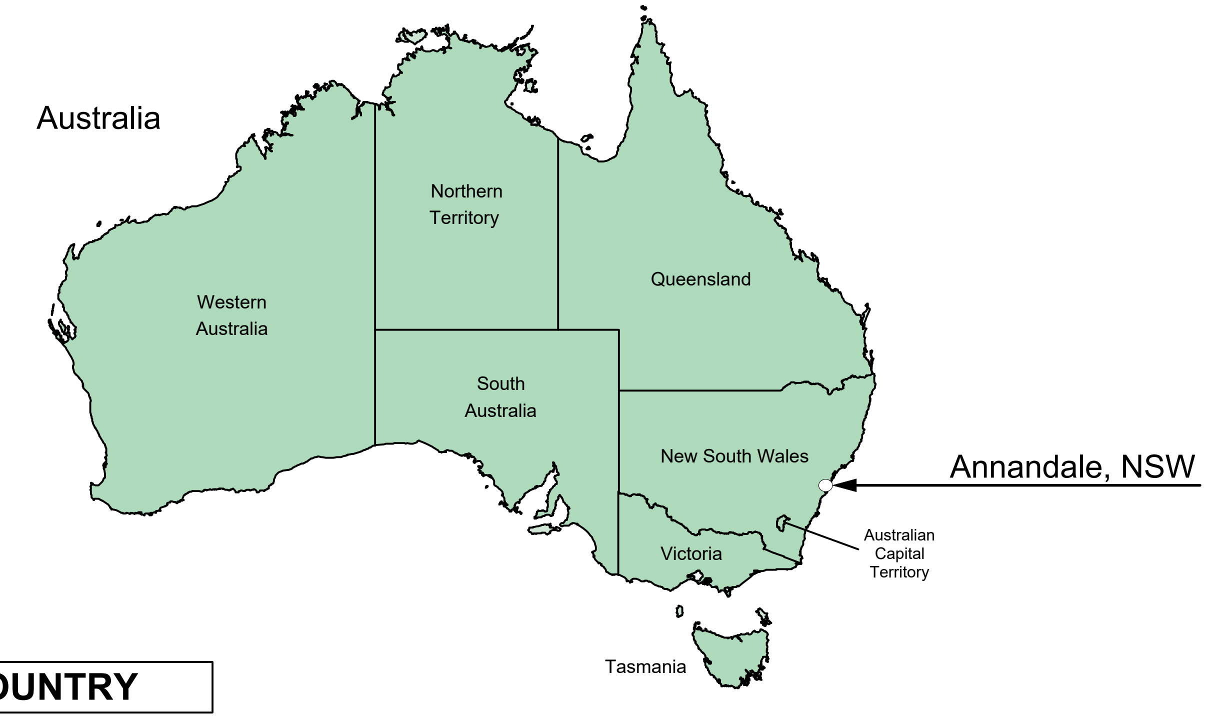
Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018 Planning: NSW Crown Copyright - Planning & Environment

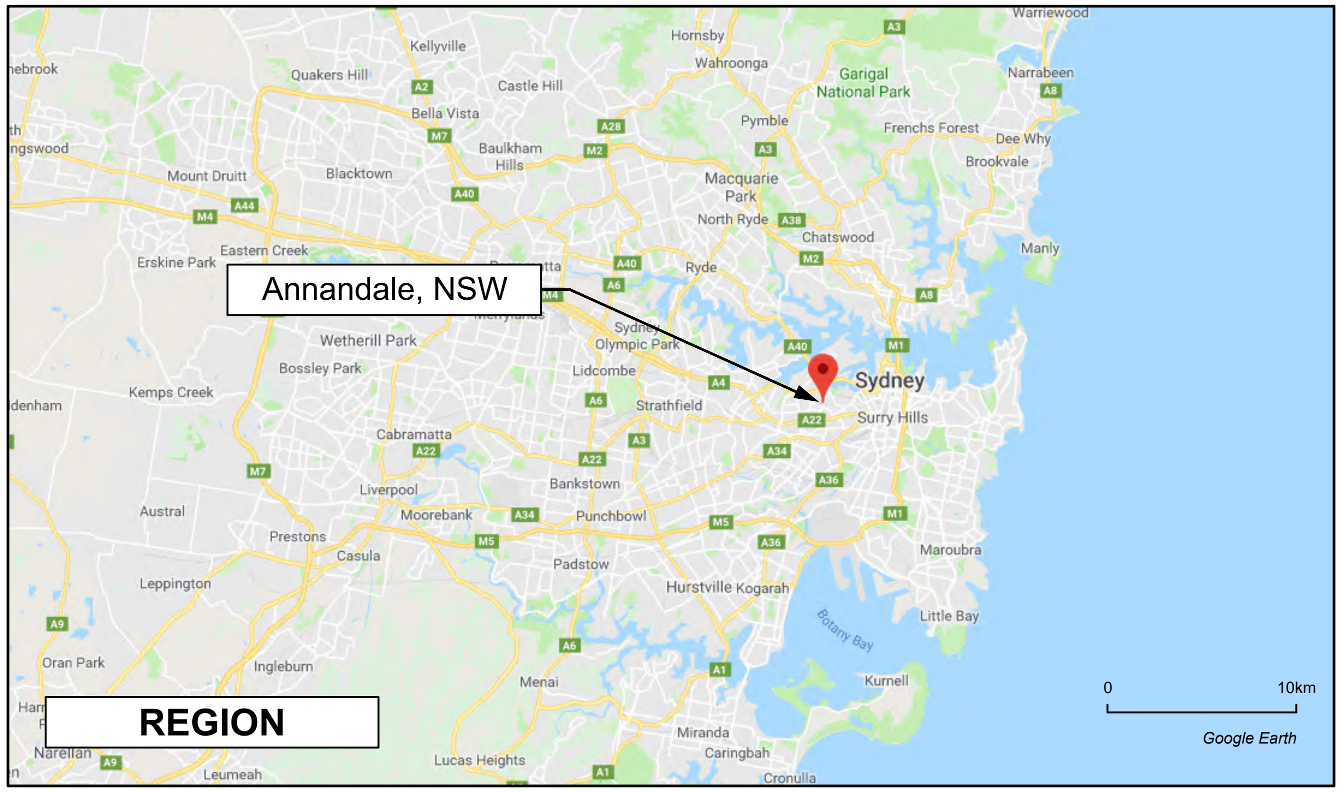
Coordinate System: GDA 1994 MGA Zone 56

Date: 08 October 2018

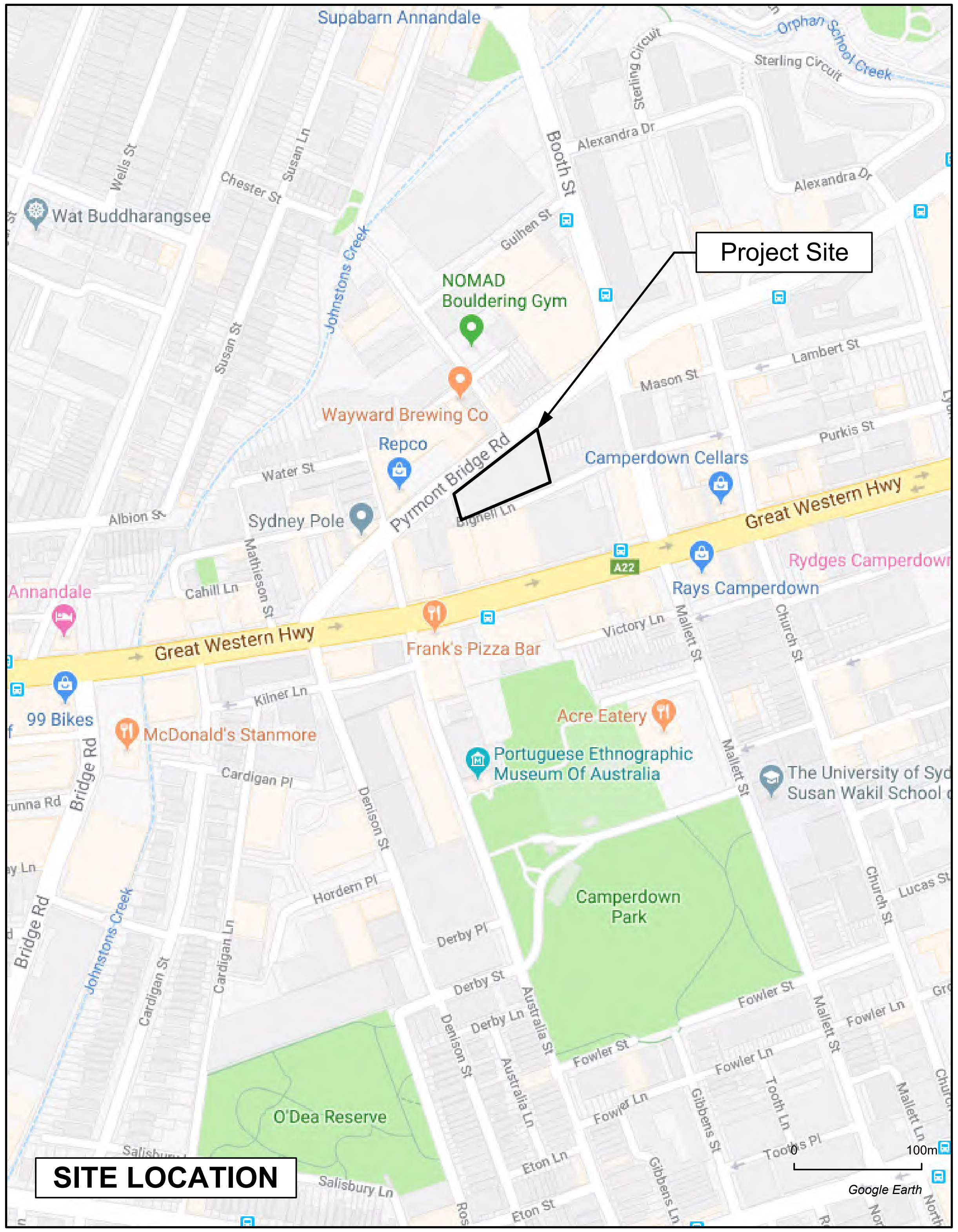
SESL (March 2019)
DSI 79 PBR Area



COUNTRY



REGION



SITE LOCATION

VER	DATE	AMENDMENTS	DRW	CKD
V4	17/05/2019	suspected ust label updated	LDW	
V3	17/05/2019	ust added to F4, new F5 and F6 drafted	LDW	
02	27/02/2019	project ref. no. updated, sv sampling locations added	LDW	
01	26/02/2019	initial draft	LDW	

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FIGURE 1

SITE LOCATION

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

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V4	17/05/2019	suspected ust label updated	LDW	
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VER	DATE	AMENDMENTS	DRW	CKD

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FIGURE 2
SITE BOUNDARY

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

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FIGURE 3
FEATURES OF INTEREST

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

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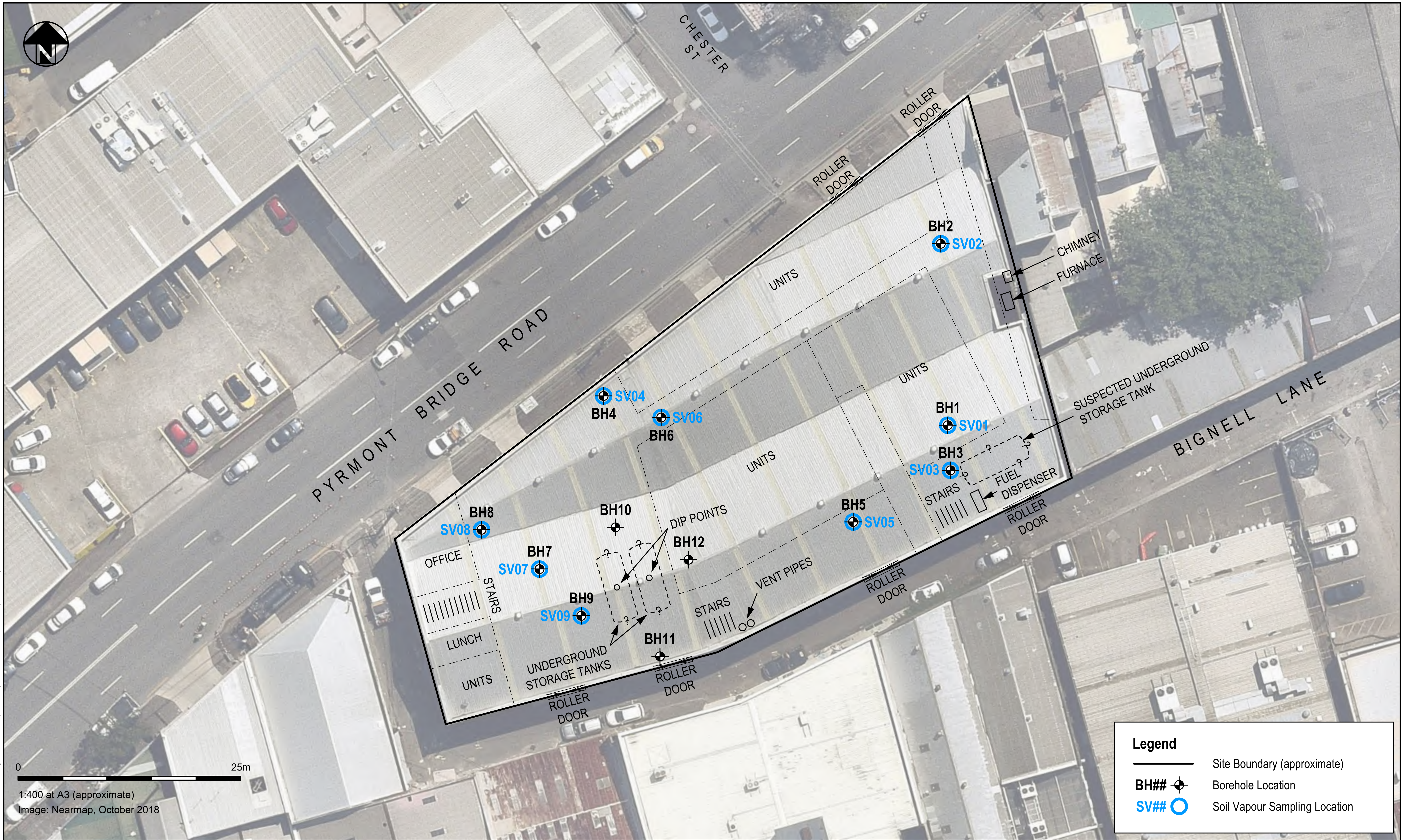

VER	DATE	AMENDMENTS	DRW	CKD
V4	17/05/2019	suspected ust label updated	LDW	
V3	17/05/2019	ust added to F4, new F5 and F6 drafted	LDW	
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ABN 70 106 810 708 L 1300 30 40 80 F 1300 64 46 89

FIGURE 4
SITE LAYOUT

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259	Northing: 6248957	Datum mAHD; UTM MGA 56H	PRINT: A3 (L)

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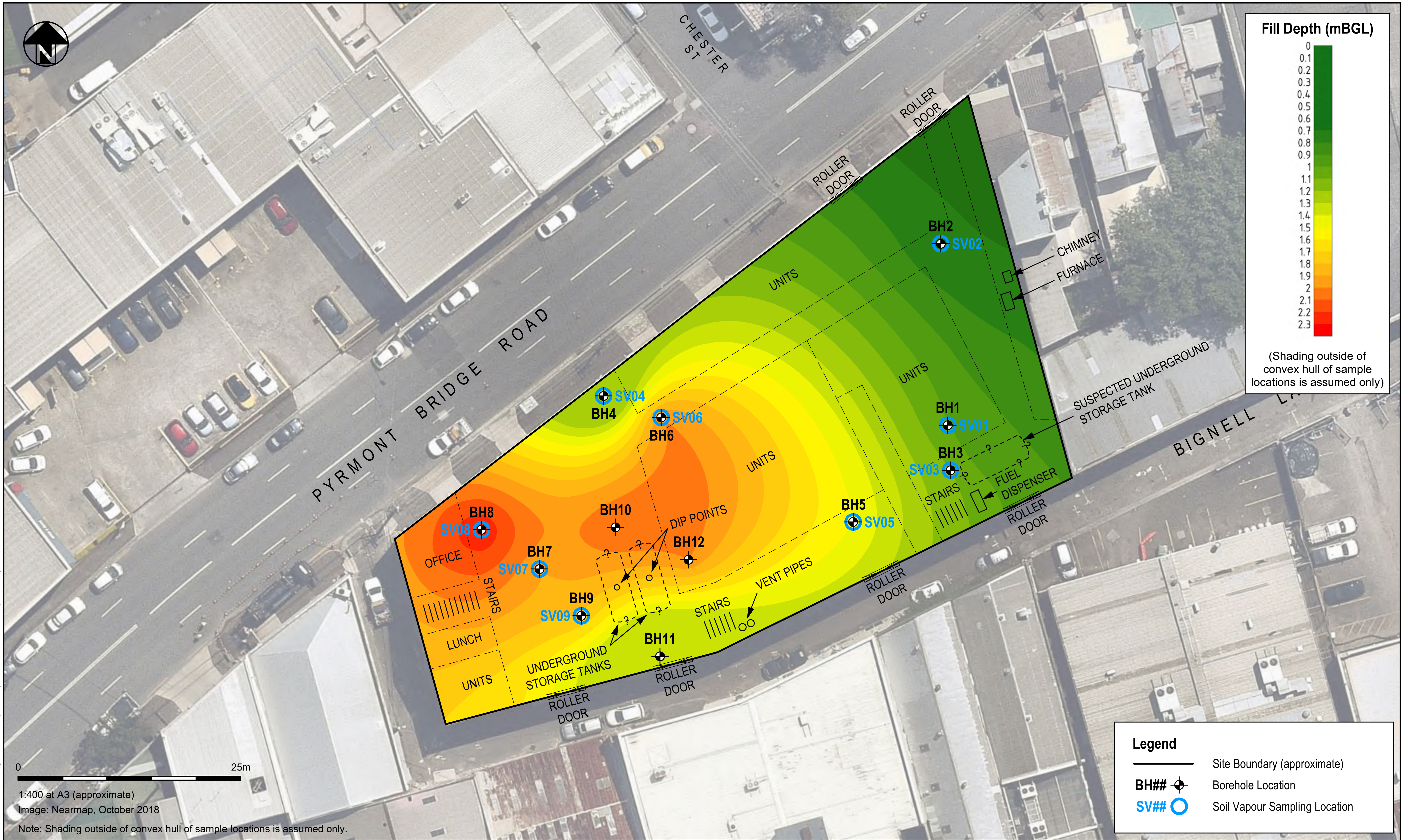

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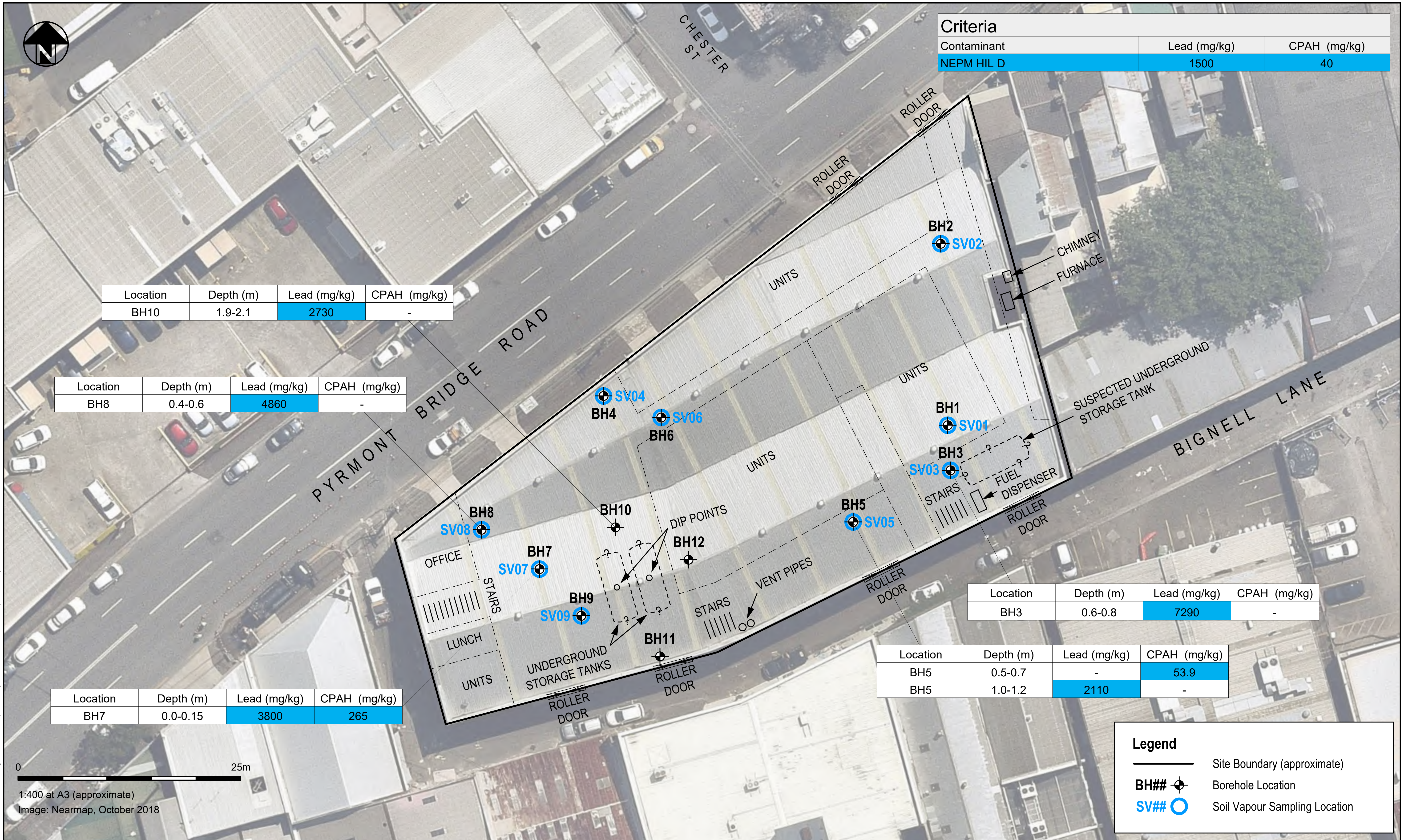
FIGURE 5
APPROXIMATE FILL THICKNESS

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)



Criteria

Contaminant	Lead (mg/kg)	CPAH (mg/kg)
NEPM HIL D	1500	40

Location	Depth (m)	Lead (mg/kg)	CPAH (mg/kg)
BH10	1.9-2.1	2730	-

Location	Depth (m)	Lead (mg/kg)	CPAH (mg/kg)
BH8	0.4-0.6	4860	-

Location	Depth (m)	Lead (mg/kg)	CPAH (mg/kg)
BH3	0.6-0.8	7290	-

Location	Depth (m)	Lead (mg/kg)	CPAH (mg/kg)
BH5	0.5-0.7	-	53.9
BH5	1.0-1.2	2110	-

Location	Depth (m)	Lead (mg/kg)	CPAH (mg/kg)
BH7	0.0-0.15	3800	265

VER	DATE	AMENDMENTS	DRW	CKD
V4	17/05/2019	suspected ust label updated	LDW	
V3	17/05/2019	ust added to F4, new F5 and F6 drafted	LDW	
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FIGURE 6
HSL D SOIL SAMPLE EXCEEDANCES

Project Ref:	J001248
Project:	Detailed Site Investigation
Location:	79 Pyrmont Bridge Road, Annandale NSW
Client:	Lendlease Samsung Bouygues Joint Venture

Easting: 331259 | Northing: 6248957 | Datum mAHD; UTM MGA 56H | PRINT: A3 (L)

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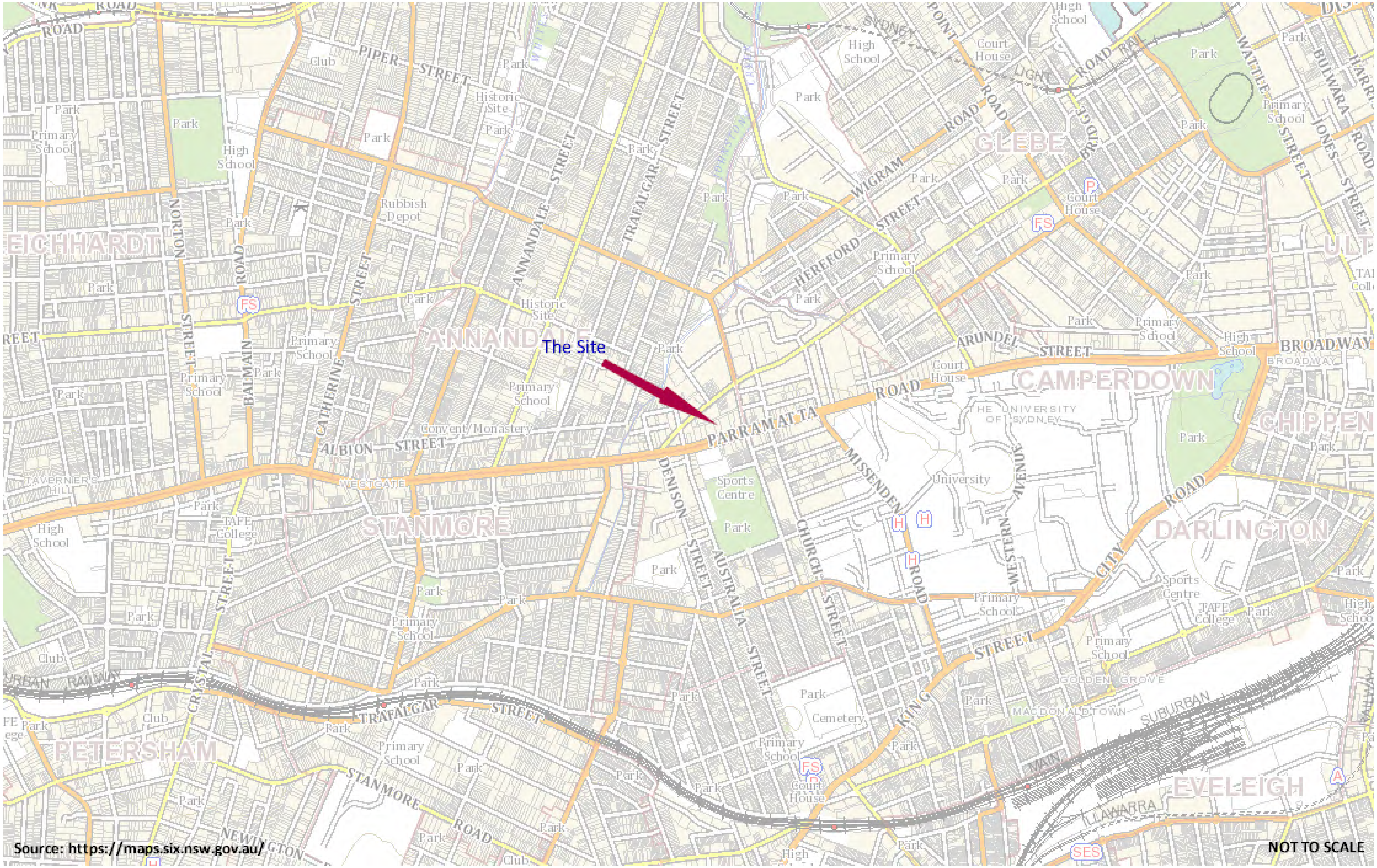
Alliance Geotechnical (May 2019)
DSI PBR site



Alliance Geotechnical ENGINEERING | ENVIRONMENTAL | TESTING Manage the earth, eliminate the risk	Site Locality				
	Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	1
	Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	02 April 2019
	Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-2

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
Manage the earth, eliminate the risk

Site Layout

Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	2
Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	02 April 2019
Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-3

Alliance Geotechnical	Area of Environmental Concern				
ENGINEERING | ENVIRONMENTAL | TESTING	Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	3
Manage the earth, eliminate the risk	Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	02 April 2019
	Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-3

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
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Sampling Point Layout Plan

Client Name:	Lendlease Samsung Bouygues Joint Venture	Figure Number:	4
Project Name:	WestConnex M4-M5 Link Tunnels	Figure Date:	02 April 2019
Project Location:	Pyrmont Bridge Road (PBR) Site	Report Number:	8272-ER-1-3

N

Approximate Identified UST and Associated Sampling Point Locations

Client Name:	Lendlease Samsung Bouygues Joint Venture	Figure Number:	5
Project Name:	WestConnex M4-M5 Link Tunnels	Figure Date:	26 June 2019
Project Location:	Pyrmont Bridge Road (PBR) Site	Report Number:	8272-ER-1-3

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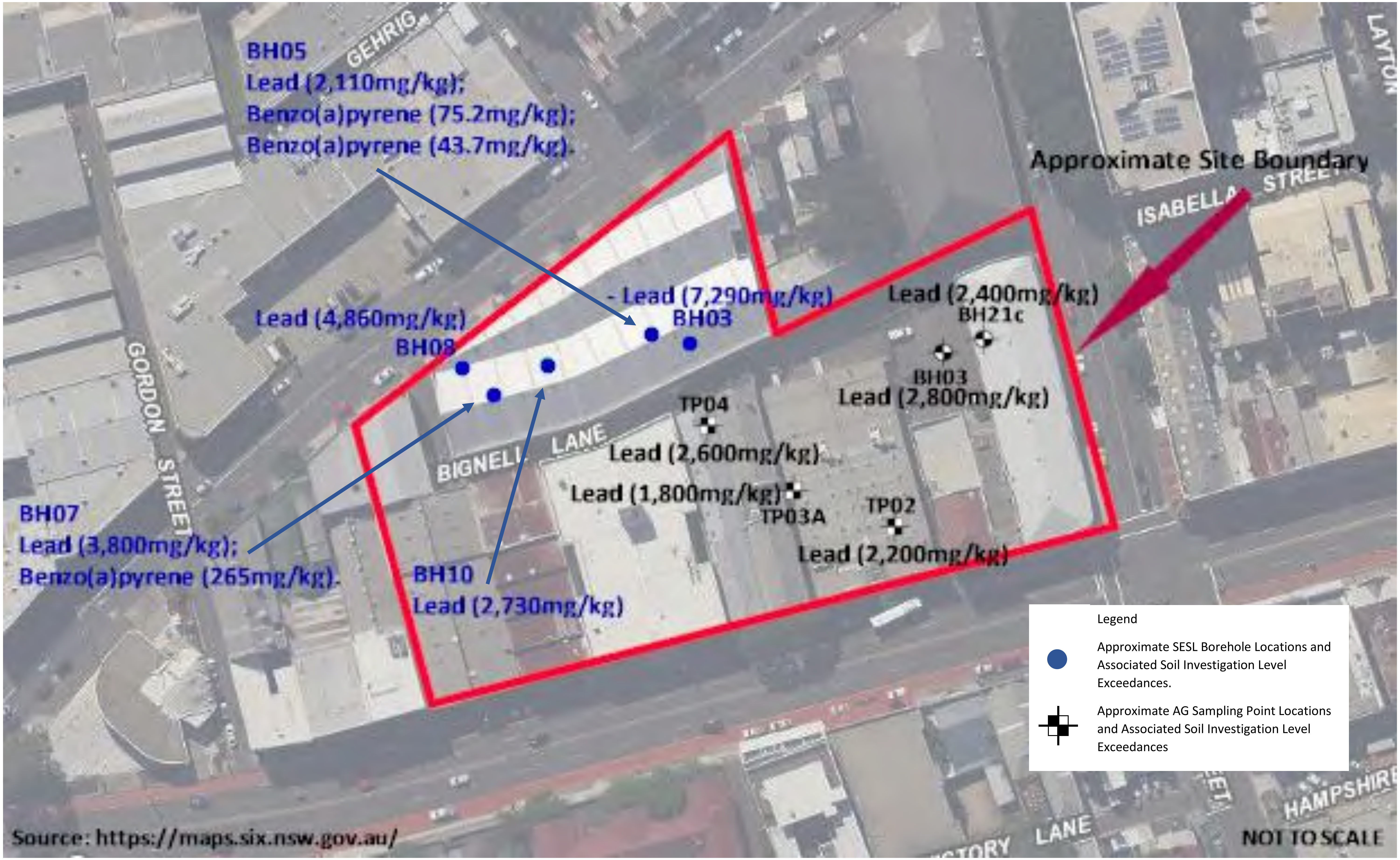
Approximate Extent of Aesthetic Impacts identified Onsite

Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	6
Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	26 June 2019
Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-3



Alliance Geotechnical
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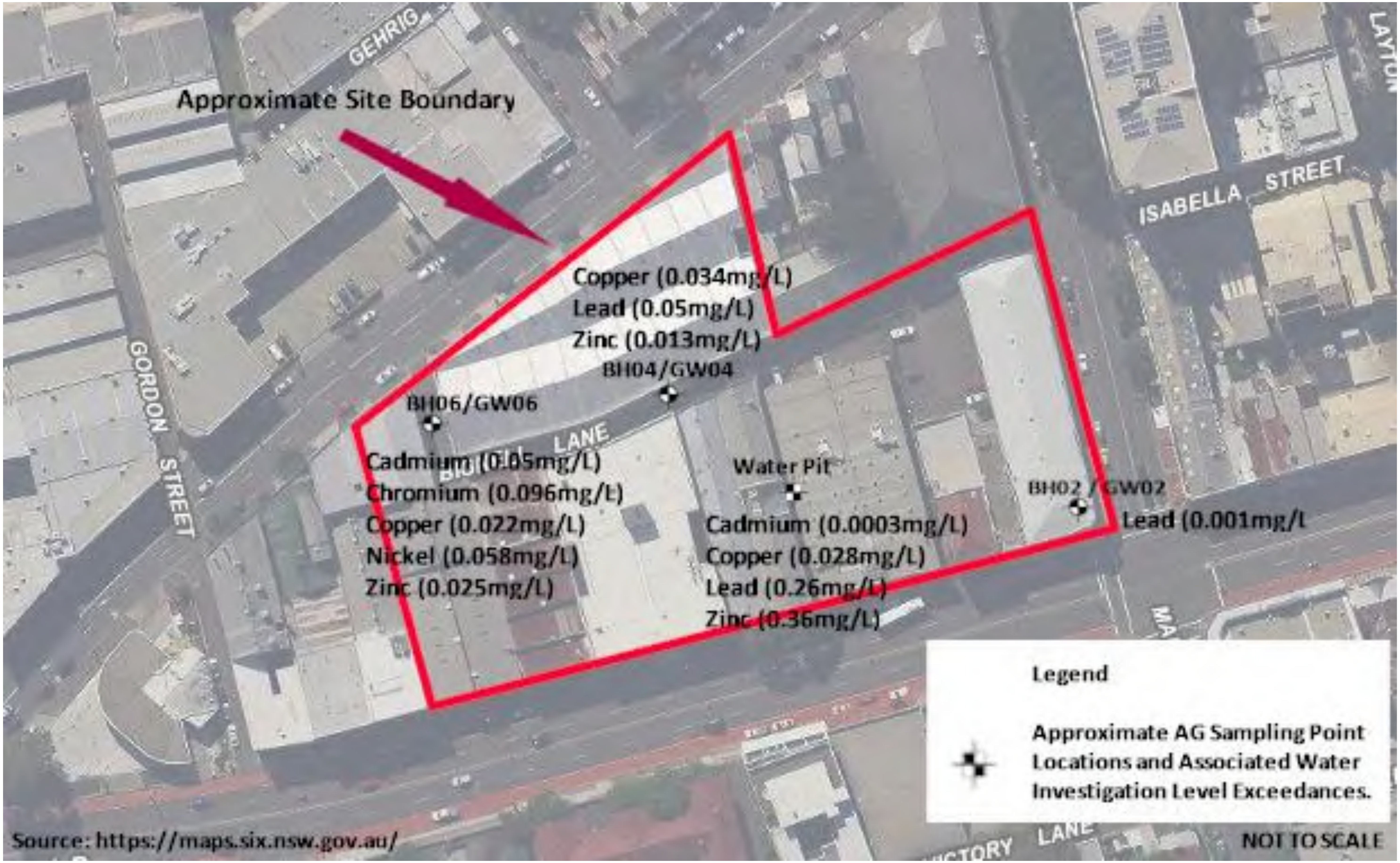
Approximate Exceedance of Soil Investigation Levels

Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	7
Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	26 June 2019
Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-3



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Approximate Exceedance of Water Investigation Levels

Client Name:	Lendlease Samsung Bouygues Joint Venture	N	Figure Number:	8
Project Name:	WestConnex M4-M5 Link Tunnels		Figure Date:	26 June 2019
Project Location:	Pyrmont Bridge Road (PBR) Site		Report Number:	8272-ER-1-3

TABLES

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013 Commercial / Industrial D	Data Set Minimum	Data Set Maximum	TP01-0.0-0.2	TP01-0.4-0.6	TP01-1.0-1.2	TP02B	TP02C	TP02-0.0-0.2	TP02-0.4-0.6	TP02-0.7-0.9	TP03-0.0-0.2	TP03-0.5-0.7	TP03-0.8-1.0	TP03A-0.0-0.2	TP03A-0.4-0.6
	Reference						S19-Ja26563	S19-Ja26564	S19-Ja26565	S19-Ma03551	S19-Ma03552	S19-Ja26566	S19-Ja26567	S19-Ja26568	S19-Ja26569	S19-Ja26570	S19-Ja26571	S19-Ja26572	S19-Ja26573
	Date Sampled						30/01/2019	30/01/2019	30/01/2019	1/03/2019	1/03/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019	30/01/2019
	Sample Matrix						Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Metals	Arsenic, As	mg/kg	2	3,000	2.3	54.0	54	25	8.5	11	9.4	3	5.8	17	2.3	8.7	7.5	10	12
	Cadmium, Cd	mg/kg	0.4	500	0.4	13.0	0.7	< 0.4	< 0.4	< 0.4	1.1	< 0.4	< 0.4	8.2	< 0.4	< 0.4	< 0.4	0.5	0.5
	Chromium, Cr	mg/kg	5.0	3,600	5.2	730.0	29	19	26	35	25	53	6.6	730	17	23	26	22	15
	Copper, Cu	mg/kg	5.0	240,000	5.6	780.0	100	59	< 5	12	780	24	34	190	18	39	< 5	600	58
	Lead, Pb	mg/kg	5	1,500	6.1	2800.0	340	200	30	39	190	27	60	2200	41	230	21	590	1800
	Mercury (inorganic)	mg/kg	0.10	730	0.1	2.0	0.2	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	0.7	< 0.1	0.2	0.1
	Nickel, Ni	mg/kg	5.0	6,000	5.4	200.0	19	8.9	6.8	17	7.4	54	< 5	200	16	9.7	9.4	9.7	8.4
	Zinc, Zn	mg/kg	5.0	400,000	5.2	1600.0	320	190	69	42	810	79	120	810	130	100	16	810	1400
PAH	Acenaphthene	mg/kg	0.5	-	0.0	0.0	< 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	0.9	< 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	-	0.6	1.6	1.1	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	0.6	5.3	5.3	< 0.5		< 0.5	< 0.5	< 0.5		0.6	< 0.5	0.6		< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.6	5.3	5.3	< 0.5		< 0.5	< 0.5	< 0.5		0.6	< 0.5	0.6		< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7	6.9	6.9	< 0.5		< 0.5	< 0.5	< 0.5		0.7	< 0.5	0.7		< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6	7.1	7.1	0.6		0.6	0.6	0.6		1	0.6	1		0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2	7.4	7.4	1.2		1.2	1.2	1.2		1.3	1.2	1.3		1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5	4.0	3.8	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	0.6		0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8	3.0	3	< 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	3.5	3.5	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	1.0	4.6	4.6	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0	0.0	< 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	10.0	10	< 0.5		< 0.5	< 0.5	< 0.5		1.2	< 0.5	1.2		0.6	< 0.5
	Fluorene	mg/kg	0.5	-	0.5	1.1	< 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	-	0.6	2.3	2.3	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5		< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	-	0.0	0.0	< 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	7.7	3.8	< 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	11.0	11	< 0.5		< 0.5	< 0.5	< 0.5		1	< 0.5	1		< 0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	-	1.1	53.7	53.7	< 0.5		< 0.5	< 0.5	< 0.5		3.4	< 0.5	4		1.1	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0	751.0	530			< 50	< 50	59		751	< 50			212	
	TRH C10-C14	mg/kg	20	-	21.0	260.0	< 20			< 20	< 20	< 20		21	< 20			< 20	
	TRH C15-C28	mg/kg	50	-	54.0	550.0	300			< 50	< 50	< 50		550	< 50			140	
	TRH C29-C36	mg/kg	50	-	50.0	230.0	230			< 50	< 50	59		180	< 50			72	
	TRH C6-C9	mg/kg	20	-	0.0	0.0	< 20			< 20	< 20	< 20		< 20	< 20			< 20	
	Naphthalene	mg/kg	0.5	-	0.0	0.0	< 0.5			< 0.5	< 0.5	< 0.5		< 0.5	< 0.5			< 0.5	
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0	420.0	< 50			< 50	< 50	< 50		60	< 50			< 50	
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0	420.0	< 50			< 50	< 50	< 50		60	< 50			< 50	
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0	730.0	610			< 100	< 100	< 100		730	< 100			200	
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0	670.0	470			< 100	< 100	< 100		670	< 100			200	
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0	140.0	140			< 100	< 100	< 100		< 100	< 100			< 100	
	TRH C6-C10	mg/kg	20	-	0.0	0.0	< 20			< 20	< 20	< 20		< 20	< 20			< 20	
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0	0.0	< 20			< 20	< 20	< 20		< 20	< 20			< 20	
BTEX	Benzene	mg/kg	0.1	-	0.0	0.0	< 0.1			< 0.1	< 0.1	< 0.1		< 0.1	< 0.1			< 0.1	
	Ethylbenzene	mg/kg	0.1	-	0.0	0.0	< 0.1			< 0.1	< 0.1	< 0.1		< 0.1	< 0.1			< 0.1	
	m/p-xylene	mg/kg	0.2	-	0.0	0.0	< 0.2			< 0.2	< 0.2	< 0.2		< 0.2	< 0.2			< 0.2	
	o-xylene	mg/kg	0.1	-	0.0	0.0	< 0.1			< 0.1	< 0.1	< 0.1		< 0.1	< 0.1			< 0.1	
	Toluene	mg/kg	0.1	-	0.0	0.0	< 0.1			< 0.1	< 0.1	< 0.1		< 0.1	< 0.1			< 0.1	
	Total Xylenes	mg/kg	0.3	-	0.0	0.0	< 0.3			< 0.3	< 0.3	< 0.3		< 0.3	< 0.3			< 0.3	
PCB	Aroclor-1016	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1221	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1232	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1242	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1248	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1254	mg/kg	0.1	-	0.0	0.0													
	Aroclor-1260	mg/kg	0.1	-	0.0	0.0													
	Total PCB*	mg/kg	0.1	7	0.0	0.0													
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.1-Dichloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.1-Dichloroethene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2-Dibromoethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2-Dichloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.2-Dichloropropane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.3-Dichloropropane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	4-Chlorotoluene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Allyl chloride	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Benzene	mg/kg	0.1	-	0.0	0.0		< 0.1						< 0.1		< 0.1			
	Bromobenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Bromochloromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Bromodichloromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Bromoform	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Bromomethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Carbon disulfide	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Carbon Tetrachloride	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Chlorobenzene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Chloroethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Chloroform	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Chloromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Dibromochloromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Dibromomethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Ethylbenzene	mg/kg	0.1	-	0.0	0.0		< 0.1						< 0.1		< 0.1			
	Iodomethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	m&p-Xylenes	mg/kg	0.2	-	0.0	0.0		< 0.2						< 0.2		< 0.2			
	Methylene Chloride	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	o-Xylene	mg/kg	0.1	-	0.0	0.0		< 0.1						< 0.1		< 0.1			
	Styrene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Tetrachloroethene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Toluene	mg/kg	0.1	-	0.0	0.0		< 0.1						< 0.1		< 0.1			
	Total MAH*	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Trichloroethene	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Trichlorofluoromethane	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Vinyl chloride	mg/kg	0.5	-	0.0	0.0		< 0.5						< 0.5		< 0.5			
	Xylenes - Total	mg/kg	0.3	-	0.0	0.0		< 0.3						< 0.3		< 0.3			
OCP	4.4 - DDD	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	4.4 - DDE	mg/kg	0.05		0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	4.4 - DDT	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	a - BHC	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Aldrin	mg/kg	0.05	-	0.1	2.7	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1	3.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	b - BHC	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Chlordanes (total)	mg/kg	0.05	530	0.4	2.0	< 0.1			< 0.1	< 0.1	< 0.1			< 0.1			1	
	d - BHC	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Dieldrin	mg/kg	0.05	-	0.1	0.3	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endosulfan 1	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endosulfan 2	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endosulfan sulphate	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endrin	mg/kg	0.05	100	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endrin Aldehyde	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Endrin Ketone	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	g-BHC (Lindane)	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Heptachlor	mg/kg	0.05	50	0.1	0.1	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Heptachlor epoxide	mg/kg	0.05	-	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Hexachlorobenzene	mg/kg	0.05	80	0.0	0.0	< 0.05			< 0.05	< 0.05	< 0.05			< 0.05			< 0.05	
	Methoxychlor	mg/kg	0.05	2,500	0.0	0.0	< 0.2			< 0.2	< 0.2	< 0.2			< 0.2			< 0.2	
	Toxaphene	mg/kg	1.0	-	0.0	0.0	< 1			< 1	< 1	< 1			< 1			< 1	
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4	3.4	< 0.2					< 0.2			< 0.2			1	
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4	2.1	< 0.2					< 0.2			< 0.2			1	
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0	0.0													
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected			Not Detected	Not Detected	NT	NT	NT	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	NT	Not Detected	Not Detected
Physical Parameters	pH	pH Units	0.1																
	Electrical Conductivity	dS/m	0.005																

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013	Sample ID	TP03A-0.6-0.8	TP04-0.1-0.3	TP04-0.4-0.5	TP04-0.6-0.7	TP04-1.2-1.3	TP04A-0.1-0.3	TP04A-0.6-0.7	TP04A-0.8-0.9	TP05-0.1-0.3	TP05-0.5-0.6	TP05-0.9-1.0	TP06-0.0-0.2	TP06-0.3-0.5	TP7.0.3
					Reference	S19-Ja26574	S19-Ja12028	S19-Ja12029	S19-Ja12030	S19-Ja12031	S19-Ja12035	S19-Ja12036	S19-Ja12037	S19-Ja12032	S19-Ja12033	S19-Ja12034	S19-Ja26575	S19-Ja26576	S19-Ja10460
					Date Sampled	30/01/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	17/1/2019	30/01/2019	30/01/2019	16/1/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Commercial / Industrial D	Data Set Minimum														
Metals	Arsenic, As	mg/kg	2	3,000	2.3	12	52	5.4	8.5	10	26	43	11	6.9	5.3	8.2	12	< 2	7.4
	Cadmium, Cd	mg/kg	0.4	500	0.4	< 0.4	1.9	< 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	mg/kg	5.0	3,600	5.2	32	9.3	12	23	23	17	28	61	20	16	19	30	7.5	25
	Copper, Cu	mg/kg	5.0	240,000	5.6	18	750	31	< 5	7.2	60	60	< 5	17	< 5	7.6	6.5	< 5	45
	Lead, Pb	mg/kg	5	1,500	6.1	97	2600	150	17	20	330	680	16	120	10	10	18	11	87
	Mercury (inorganic)	mg/kg	0.10	730	0.1	< 0.1	0.2	0.3	< 0.1	< 0.1	0.7	1.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.3
	Nickel, Ni	mg/kg	5.0	6,000	5.4	< 5	44	5.4	< 5	< 5	9.9	8.9	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Zinc, Zn	mg/kg	5.0	400,000	5.2	220	1600	77	< 5	< 5	370	510	7	110	5.2	< 5	11	< 5	100
PAH	Acenaphthene	mg/kg	0.5	-	0.0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Acenaphthylene	mg/kg	0.5	-	0.5		0.8	0.5	< 0.5	< 0.5	< 0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Anthracene	mg/kg	0.5	-	0.6		1.2	1.3	< 0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	0.6		2.9	3	< 0.5	< 0.5	1.6	2.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.6		2.5	2.5	< 0.5	< 0.5	1.3	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7		3.3	3.3	< 0.5	< 0.5	1.8	3.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6		3.6	3.5	0.6	0.6	2.1	3.6	0.6	0.6	0.6	0.6	0.6		0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2		3.8	3.8	1.2	1.2	2.3	3.9	1.2	1.2	1.2	1.2	1.2		1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5		1.9	1.6	< 0.5	< 0.5	1.9	1.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8		1.4	1.2	< 0.5	< 0.5	1.1	1.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5		1.9	1.8	< 0.5	< 0.5	0.6	2.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Chrysene	mg/kg	0.5	-	1.0		2.3	2.3	< 0.5	< 0.5	1.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Fluoranthene	mg/kg	0.5	-	0.5		6.6	6.3	< 0.5	< 0.5	3.7	7.4	< 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	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6		1.2	0.9	< 0.5	< 0.5	0.9	1.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Naphthalene	mg/kg	0.5	-	0.0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Phenanthrene	mg/kg	0.5	-	0.5		4.7	4.6	< 0.5	< 0.5	1.9	7.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Pyrene	mg/kg	0.5	-	0.5		5.9	6	< 0.5	< 0.5	3.6	6.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	Total PAH (18)	mg/kg	0.5	-	1.1		33.8	32.5	< 0.5	< 0.5	18.1	39.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0		100	100	< 50	600	65	110	< 50	< 50	< 50	< 50	< 50		114
	TRH C10-C14	mg/kg	20	-	21.0		< 20	< 20	< 20	260	< 20	< 20	< 20	< 20	< 20	< 20	< 20		< 20
	TRH C15-C28	mg/kg	50	-	54.0		100	100	< 50	340	65	110	< 50	< 50	< 50	< 50	< 50		64
	TRH C29-C36	mg/kg	50	-	50.0		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50		50
	TRH C6-C9	mg/kg	20	-	0.0		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20		< 20
	Naphthalene	mg/kg	0.5	-	0.0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0		< 50	< 50	< 50	420	< 50	< 50	< 50	< 50	< 50	< 50	< 50		< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0		< 50	< 50	< 50	420	< 50	< 50	< 50	< 50	< 50	< 50	< 50		< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0		120	130	< 100	600	< 100	130	< 100	< 100	< 100	< 100	< 100		110
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0		120	130	< 100	180	< 100	130	< 100	< 100	< 100	< 100	< 100		110
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0		< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100
	TRH C6-C10	mg/kg	20	-	0.0		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20		< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20		< 20
BTEX	Benzene	mg/kg	0.1	-	0.0		< 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	mg/kg	0.1	-	0.0		< 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	mg/kg	0.2	-	0.0		< 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	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1
	Toluene	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1
	Total Xylenes	mg/kg	0.3	-	0.0		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3		< 0.3
PCB	Aroclor-1016	mg/kg	0.1	-	0.0														< 5
	Aroclor-1221	mg/kg	0.1	-	0.0														< 2
	Aroclor-1232	mg/kg	0.1	-	0.0														< 5
	Aroclor-1242	mg/kg	0.1	-	0.0														< 5
	Aroclor-1248	mg/kg	0.1	-	0.0														< 5
	Aroclor-1254	mg/kg	0.1	-	0.0														< 0.5
	Aroclor-1260	mg/kg	0.1	-	0.0														< 0.5
	Total PCB*	mg/kg	0.1	7	0.0														<5
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0	< 0.5								< 0.5					< 0.5
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.1-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.1-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2-Dibromoethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.2-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.3-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	4-Chlorotoluene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Allyl chloride	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Benzene	mg/kg	0.1	-	0.0	< 0.1								< 0.1					< 0.1
	Bromobenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Bromochloromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Bromodichloromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Bromoform	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Bromomethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Carbon disulfide	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Carbon Tetrachloride	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Chlorobenzene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Chloroethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Chloroform	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Chloromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Dibromochloromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Dibromomethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Ethylbenzene	mg/kg	0.1	-	0.0	< 0.1								< 0.1					< 0.1
	Iodomethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	m&p-Xylenes	mg/kg	0.2	-	0.0	< 0.2								< 0.2					< 0.2
	Methylene Chloride	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	o-Xylene	mg/kg	0.1	-	0.0	< 0.1								< 0.1					< 0.1
	Styrene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Tetrachloroethene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Toluene	mg/kg	0.1	-	0.0	< 0.1								< 0.1					< 0.1
	Total MAH*	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Trichloroethene	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Trichlorofluoromethane	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Vinyl chloride	mg/kg	0.5	-	0.0	< 0.5								< 0.5					< 0.5
	Xylenes - Total	mg/kg	0.3	-	0.0	< 0.3								< 0.3					< 0.3
OCP	4.4 - DDD	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	4.4 - DDE	mg/kg	0.05		0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	4.4 - DDT	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	a - BHC	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Aldrin	mg/kg	0.05	-	0.1		< 0.05				< 0.05			0.06			< 0.05		2.7
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1		< 0.05				< 0.05			0.06			< 0.05		3.04
	b - BHC	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Chlordanes (total)	mg/kg	0.05	530	0.4		0.5				0.4			2			< 0.1		0.4
	d - BHC	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Dieldrin	mg/kg	0.05	-	0.1		< 0.05				< 0.05			< 0.05			< 0.05		0.34
	Endosulfan 1	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Endosulfan 2	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Endrin	mg/kg	0.05	100	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Endrin Ketone	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Heptachlor	mg/kg	0.05	50	0.1		< 0.05				< 0.05			0.08			< 0.05		< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Hexachlorobenzene	mg/kg	0.05	80	0.0		< 0.05				< 0.05			< 0.05			< 0.05		< 0.05
	Methoxychlor	mg/kg	0.05	2,500	0.0		< 0.2				< 0.2			< 0.2			< 0.2		< 0.2
	Toxaphene	mg/kg	1.0	-	0.0		< 1				< 1			< 1			< 1		< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4		0.5				0.4			2.13			< 0.2		3.44
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4		0.5				0.4			2.07			< 0.2		0.4
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0														
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		NT	Not Detected	Not Detected	NT	NT	Not Detected	Not Detected	NT	Not Detected	Not Detected	Not Detected	NT	NT	Not Detected
Physical Parameters	pH	pH Units	0.1												5	4.6			8
	Electrical Conductivity	dS/m	0.005												0.11	0.098			0.85

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Sample ID	TP7.0.8
Reference	S19-Ja10461
Date Sampled	16/1/2019
Sample Matrix	Soil

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013		
				Commercial / Industrial D	Data Set Minimum	
Metals	Arsenic, As	mg/kg	2	3,000	2.3	< 2
	Cadmium, Cd	mg/kg	0.4	500	0.4	< 0.4
	Chromium, Cr	mg/kg	5.0	3,600	5.2	< 5
	Copper, Cu	mg/kg	5.0	240,000	5.6	< 5
	Lead, Pb	mg/kg	5	1,500	6.1	7.3
	Mercury (inorganic)	mg/kg	0.10	730	0.1	< 0.1
	Nickel, Ni	mg/kg	5.0	6,000	5.4	< 5
	Zinc, Zn	mg/kg	5.0	400,000	5.2	< 5
PAH	Acenaphthene	mg/kg	0.5	-	0.0	< 0.5
	Acenaphthylene	mg/kg	0.5	-	0.5	< 0.5
	Anthracene	mg/kg	0.5	-	0.6	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	0.6	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.6	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5	< 0.5
	Chrysene	mg/kg	0.5	-	1.0	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0	< 0.5
	Fluoranthene	mg/kg	0.5	-	0.5	< 0.5
	Fluorene	mg/kg	0.5	-	0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6	< 0.5
	Naphthalene	mg/kg	0.5	-	0.0	< 0.5
	Phenanthrene	mg/kg	0.5	-	0.5	< 0.5
	Pyrene	mg/kg	0.5	-	0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	-	1.1	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0	< 50
	TRH C10-C14	mg/kg	20	-	21.0	< 20
	TRH C15-C28	mg/kg	50	-	54.0	< 50
	TRH C29-C36	mg/kg	50	-	50.0	< 50
	TRH C6-C9	mg/kg	20	-	0.0	< 20
	Naphthalene	mg/kg	0.5	-	0.0	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0	< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0	< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0	< 100
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0	< 100
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0	< 100
	TRH C6-C10	mg/kg	20	-	0.0	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0	< 20
BTEX	Benzene	mg/kg	0.1	-	0.0	< 0.1
	Ethylbenzene	mg/kg	0.1	-	0.0	< 0.1
	m/p-xylene	mg/kg	0.2	-	0.0	< 0.2
	o-xylene	mg/kg	0.1	-	0.0	< 0.1
	Toluene	mg/kg	0.1	-	0.0	< 0.1
	Total Xylenes	mg/kg	0.3	-	0.0	< 0.3
PCB	Aroclor-1016	mg/kg	0.1	-	0.0	< 0.5
	Aroclor-1221	mg/kg	0.1	-	0.0	< 0.1
	Aroclor-1232	mg/kg	0.1	-	0.0	< 0.5
	Aroclor-1242	mg/kg	0.1	-	0.0	< 0.5
	Aroclor-1248	mg/kg	0.1	-	0.0	< 0.5
	Aroclor-1254	mg/kg	0.1	-	0.0	< 0.5
	Aroclor-1260	mg/kg	0.1	-	0.0	< 0.5
	Total PCB*	mg/kg	0.1	7	0.0	< 0.5
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0	< 0.5
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0	< 0.5
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5
	1.1-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5
	1.1-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0	< 0.5
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5
	1.2-Dibromoethane	mg/kg	0.5	-	0.0	< 0.5
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5
	1.2-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5
	1.2-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5
	1.3-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0	< 0.5
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0	< 0.5
	4-Chlorotoluene	mg/kg	0.5	-	0.0	< 0.5
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0	< 0.5
	Allyl chloride	mg/kg	0.5	-	0.0	< 0.5
	Benzene	mg/kg	0.1	-	0.0	< 0.1
	Bromobenzene	mg/kg	0.5	-	0.0	< 0.5
	Bromochloromethane	mg/kg	0.5	-	0.0	< 0.5
	Bromodichloromethane	mg/kg	0.5	-	0.0	< 0.5
	Bromoform	mg/kg	0.5	-	0.0	< 0.5
	Bromomethane	mg/kg	0.5	-	0.0	< 0.5
	Carbon disulfide	mg/kg	0.5	-	0.0	< 0.5
	Carbon Tetrachloride	mg/kg	0.5	-	0.0	< 0.5
	Chlorobenzene	mg/kg	0.5	-	0.0	< 0.5
	Chloroethane	mg/kg	0.5	-	0.0	< 0.5
	Chloroform	mg/kg	0.5	-	0.0	< 0.5
	Chloromethane	mg/kg	0.5	-	0.0	< 0.5
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5
	Dibromochloromethane	mg/kg	0.5	-	0.0	< 0.5
	Dibromomethane	mg/kg	0.5	-	0.0	< 0.5
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0	< 0.5
	Ethylbenzene	mg/kg	0.1	-	0.0	< 0.1
	Iodomethane	mg/kg	0.5	-	0.0	< 0.5
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0	< 0.5
	m&p-Xylenes	mg/kg	0.2	-	0.0	< 0.2
	Methylene Chloride	mg/kg	0.5	-	0.0	< 0.5
	o-Xylene	mg/kg	0.1	-	0.0	< 0.1
	Styrene	mg/kg	0.5	-	0.0	< 0.5
	Tetrachloroethene	mg/kg	0.5	-	0.0	< 0.5
	Toluene	mg/kg	0.1	-	0.0	< 0.1
	Total MAH*	mg/kg	0.5	-	0.0	< 0.5
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5
	Trichloroethene	mg/kg	0.5	-	0.0	< 0.5
	Trichlorofluoromethane	mg/kg	0.5	-	0.0	< 0.5
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5
	Vinyl chloride	mg/kg	0.5	-	0.0	< 0.5
	Xylenes - Total	mg/kg	0.3	-	0.0	< 0.3
OCP	4.4 - DDD	mg/kg	0.05	-	0.0	
	4.4 - DDE	mg/kg	0.05		0.0	
	4.4 - DDT	mg/kg	0.05	-	0.0	
	a - BHC	mg/kg	0.05	-	0.0	
	Aldrin	mg/kg	0.05	-	0.1	
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1	
	b - BHC	mg/kg	0.05	-	0.0	
	Chlordanes (total)	mg/kg	0.05	530	0.4	
	d - BHC	mg/kg	0.05	-	0.0	
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0	
	Dieldrin	mg/kg	0.05	-	0.1	
	Endosulfan 1	mg/kg	0.05	-	0.0	
	Endosulfan 2	mg/kg	0.05	-	0.0	
	Endosulfan sulphate	mg/kg	0.05	-	0.0	
	Endrin	mg/kg	0.05	100	0.0	
	Endrin Aldehyde	mg/kg	0.05	-	0.0	
	Endrin Ketone	mg/kg	0.05	-	0.0	
	g-BHC (Lindane)	mg/kg	0.05	-	0.0	
	Heptachlor	mg/kg	0.05	50	0.1	
	Heptachlor epoxide	mg/kg	0.05	-	0.0	
	Hexachlorobenzene	mg/kg	0.05	80	0.0	
	Methoxychlor	mg/kg	0.05	2,500	0.0	
	Toxaphene	mg/kg	1.0	-	0.0	
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4	
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4	
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0	
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		Not Detected
Physical Parameters	pH	pH Units	0.1			5.3
	Electrical Conductivity	dS/m	0.005			0.036

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

					Sample ID	TP7.1.3	TP8.0.3	TP8.0.8	TP8.1.3	TP9.0.3	TP9.0.4	TP9.0.8	TP9.1.3	TP10.0.3	TP10.0.8	TP10.1.3	TP11.0.3	TP11.0.8	TP11.1.3	TP12.0.3
					Reference	S19-Ja10462	S19-Ja10463	S19-Ja10464	S19-Ja10465	S19-Ja10466	S19-Ja10467	S19-Ja10468	S19-Ja10469	S19-Ja10470	S19-Ja10471	S19-Ja10472	S19-Ja10473	S19-Ja10474	S19-Ja10475	S19-Ja10480
					Date Sampled	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013 Commercial / Industrial D	Data Set Minimum															
Metals	Arsenic, As	mg/kg	2	3,000	2.3	< 2	6.2	42	9.2	3.3	< 2	6.3	13	3.8	13	6.6	43	4.1	< 2	2.5
	Cadmium, Cd	mg/kg	0.4	500	0.4	< 0.4	< 0.4	0.8	< 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	mg/kg	5.0	3,600	5.2	< 5	13	16	17	12	< 5	16	27	34	37	17	22	< 5	5.2	5.3
	Copper, Cu	mg/kg	5.0	240,000	5.6	< 5	72	110	14	< 5	15	< 5	6	49	< 5	5.6	13	< 5	6.6	7.8
	Lead, Pb	mg/kg	5	1,500	6.1	11	1100	370	18	12	20	26	23	80	15	21	20	9.5	12	57
	Mercury (inorganic)	mg/kg	0.10	730	0.1	< 0.1	0.6	1.2	< 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	mg/kg	5.0	6,000	5.4	< 5	8.9	12	< 5	< 5	7.3	< 5	< 5	16	< 5	< 5	< 5	< 5	< 5	< 5
	Zinc, Zn	mg/kg	5.0	400,000	5.2	< 5	250	800	15	6.9	25	12	10	640	23	34	16	< 5	6.5	48
PAH	Acenaphthene	mg/kg	0.5	-	0.0	< 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
	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
	Anthracene	mg/kg	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
	Benzo(a)anthracene	mg/kg	0.5	-	0.6	< 0.5	< 0.5	1	< 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	-	0.6	< 0.5	< 0.5	1.1	< 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	TEQ (mg/kg)	0.5	-	0.7	< 0.5	< 0.5	1.5	< 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	TEQ (mg/kg)	0.5	40	0.6	0.6	0.6	1.7	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	TEQ (mg/kg)	0.5	-	1.2	1.2	1.2	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	mg/kg	0.5	-	0.5	< 0.5	< 0.5	1.3	< 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	mg/kg	0.5	-	0.8	< 0.5	< 0.5	1	< 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
	Chrysene	mg/kg	0.5	-	1.0	< 0.5	< 0.5	1	< 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	mg/kg	0.5	-	0.0	< 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
	Fluoranthene	mg/kg	0.5	-	0.5	< 0.5	< 0.5	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
	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
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6	< 0.5	< 0.5	0.7	< 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	mg/kg	0.5	-	0.0	< 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
	Phenanthrene	mg/kg	0.5	-	0.5	< 0.5	< 0.5	0.7	< 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	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
	Total PAH (18)	mg/kg	0.5	-	1.1	< 0.5	< 0.5	11.7	< 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	TRH C10-C36 Total	mg/kg	50	-	54.0	< 50	130	54	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH C10-C14	mg/kg	20	-	21.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C15-C28	mg/kg	50	-	54.0	< 50	70	54	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH C29-C36	mg/kg	50	-	50.0	< 50	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH C6-C9	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	Naphthalene	mg/kg	0.5	-	0.0	< 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
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0	< 100	110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	TRH C6-C10	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
BTEX	Benzene	mg/kg	0.1	-	0.0	< 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	mg/kg	0.1	-	0.0	< 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	mg/kg	0.2	-	0.0	< 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	mg/kg	0.1	-	0.0	< 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
	Toluene	mg/kg	0.1	-	0.0	< 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
	Total Xylenes	mg/kg	0.3	-	0.0	< 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
PCB	Aroclor-1016	mg/kg	0.1	-	0.0	< 0.5	< 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	
	Aroclor-1221	mg/kg	0.1	-	0.0	< 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	
	Aroclor-1232	mg/kg	0.1	-	0.0	< 0.5	< 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	
	Aroclor-1242	mg/kg	0.1	-	0.0	< 0.5	< 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	
	Aroclor-1248	mg/kg	0.1	-	0.0	< 0.5	< 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	
	Aroclor-1254	mg/kg	0.1	-	0.0	< 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	
	Aroclor-1260	mg/kg	0.1	-	0.0	< 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	
	Total PCB*	mg/kg	0.1	7	0.0	< 0.5	<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	
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0	< 0.5														
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5														
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0	< 0.5														
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0	< 0.5														
	1.1-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5														
	1.1-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5														
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0	< 0.5														
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5														
	1.2-Dibromoethane	mg/kg	0.5	-	0.0	< 0.5														
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5														
	1.2-Dichloroethane	mg/kg	0.5	-	0.0	< 0.5														
	1.2-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5														
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0	< 0.5														
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5														
	1.3-Dichloropropane	mg/kg	0.5	-	0.0	< 0.5														
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0	< 0.5														

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0	< 0.5														
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0	< 0.5														
	4-Chlorotoluene	mg/kg	0.5	-	0.0	< 0.5														
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0	< 0.5														
	Allyl chloride	mg/kg	0.5	-	0.0	< 0.5														
	Benzene	mg/kg	0.1	-	0.0	< 0.1														
	Bromobenzene	mg/kg	0.5	-	0.0	< 0.5														
	Bromochloromethane	mg/kg	0.5	-	0.0	< 0.5														
	Bromodichloromethane	mg/kg	0.5	-	0.0	< 0.5														
	Bromoform	mg/kg	0.5	-	0.0	< 0.5														
	Bromomethane	mg/kg	0.5	-	0.0	< 0.5														
	Carbon disulfide	mg/kg	0.5	-	0.0	< 0.5														
	Carbon Tetrachloride	mg/kg	0.5	-	0.0	< 0.5														
	Chlorobenzene	mg/kg	0.5	-	0.0	< 0.5														
	Chloroethane	mg/kg	0.5	-	0.0	< 0.5														
	Chloroform	mg/kg	0.5	-	0.0	< 0.5														
	Chloromethane	mg/kg	0.5	-	0.0	< 0.5														
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5														
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5														
	Dibromochloromethane	mg/kg	0.5	-	0.0	< 0.5														
	Dibromomethane	mg/kg	0.5	-	0.0	< 0.5														
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0	< 0.5														
	Ethylbenzene	mg/kg	0.1	-	0.0	< 0.1														
	Iodomethane	mg/kg	0.5	-	0.0	< 0.5														
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0	< 0.5														
	m&p-Xylenes	mg/kg	0.2	-	0.0	< 0.2														
	Methylene Chloride	mg/kg	0.5	-	0.0	< 0.5														
	o-Xylene	mg/kg	0.1	-	0.0	< 0.1														
	Styrene	mg/kg	0.5	-	0.0	< 0.5														
	Tetrachloroethene	mg/kg	0.5	-	0.0	< 0.5														
	Toluene	mg/kg	0.1	-	0.0	< 0.1														
	Total MAH*	mg/kg	0.5	-	0.0	< 0.5														
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0	< 0.5														
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0	< 0.5														
	Trichloroethene	mg/kg	0.5	-	0.0	< 0.5														
	Trichlorofluoromethane	mg/kg	0.5	-	0.0	< 0.5														
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5														
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0	< 0.5														
	Vinyl chloride	mg/kg	0.5	-	0.0	< 0.5														
	Xylenes - Total	mg/kg	0.3	-	0.0	< 0.3														
OCP	4.4 - DDD	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	4.4 - DDE	mg/kg	0.05		0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	4.4 - DDT	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	a - BHC	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Aldrin	mg/kg	0.05	-	0.1		0.49			< 0.05				< 0.05			< 0.05			< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1		0.63			< 0.05				0.12			< 0.05			< 0.05
	b - BHC	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Chlordanes (total)	mg/kg	0.05	530	0.4		< 0.1			< 0.1				< 0.1			< 0.1			< 0.1
	d - BHC	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Dieldrin	mg/kg	0.05	-	0.1		0.14			< 0.05				0.12			< 0.05			< 0.05
	Endosulfan 1	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Endosulfan 2	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Endrin	mg/kg	0.05	100	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Endrin Ketone	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Heptachlor	mg/kg	0.05	50	0.1		< 0.05			< 0.05				< 0.05			< 0.05			0.06
	Heptachlor epoxide	mg/kg	0.05	-	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Hexachlorobenzene	mg/kg	0.05	80	0.0		< 0.05			< 0.05				< 0.05			< 0.05			< 0.05
	Methoxychlor	mg/kg	0.05	2,500	0.0		< 0.2			< 0.2				< 0.2			< 0.2			< 0.2
	Toxaphene	mg/kg	1.0	-	0.0		< 1			< 1				< 1			< 1			< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4		0.63			< 0.2				< 0.2			< 0.2			< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4		< 0.2			< 0.2				< 0.2			< 0.2			< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0															
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Physical Parameters	pH	pH Units	0.1			5.3	9.6	8.6	7.3	7.6	8.6	7.8	7.6	7.9	4.8	5.9	4.6	5.1	5.1	7.8
	Electrical Conductivity	dS/m	0.005			0.043	1.5	0.26	0.59	0.11	0.14	0.23	0.38	0.2	0.11	0.089	0.056	0.028	0.14	0.58

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

- No published criteria

NL Not Limiting

NT Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

					Sample ID	TP12.0.8	TP12.1.3	TP12.1.8	TP12.2.3	TP12.2.8	TP12.3.2	BH01-0.0-0.2	BH01-0.2-0.4	BH01-1.0-1.2	BH02-0.2-0.4	BH02-1.0-1.2	BH02-1.9-2.1	BH02-2.7-2.9	BH03-0.15-0.3
					Reference	S19-Ja10481	S19-Ja10482	S19-Ja10483	S19-Ja10484	S19-Ja10485	S19-Ja10486	S19-Ja28087	S19-Ja28095	S19-Ja28096	S19-Ma03542	S19-Ma03543	S19-Ma03544	S19-Ma03545	S19-Ja28086
					Date Sampled	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	16/1/2019	31/01/2019	31/01/2019	31/01/2019	1/03/2019	1/03/2019	1/03/2019	1/03/2019	31/01/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Health Investigation Levels for Soil Contaminants - NEPC 2013															
Group	Analyte	Units	PQL	Commercial / Industrial D	Data Set Minimum														
Metals	Arsenic, As	mg/kg	2	3,000	2.3	7.7	6.2	5.3	14	4.3	7.9	19	22	8.6	9.4	5.2	10	11	4.6
	Cadmium, Cd	mg/kg	0.4	500	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	0.6
	Chromium, Cr	mg/kg	5.0	3,600	5.2	14	12	14	32	11	14	40	22	12	32	28	32	34	18
	Copper, Cu	mg/kg	5.0	240,000	5.6	8.6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	96	18	14	16	42
	Lead, Pb	mg/kg	5	1,500	6.1	59	35	21	16	11	15	36	34	19	240	130	40	35	1300
	Mercury (inorganic)	mg/kg	0.10	730	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	2	0.3	0.1	0.6
	Nickel, Ni	mg/kg	5.0	6,000	5.4	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	18	6.4	21	21	20
	Zinc, Zn	mg/kg	5.0	400,000	5.2	48	36	14	< 5	< 5	< 5	< 5	< 5	< 5	440	280	150	150	500
PAH	Acenaphthene	mg/kg	0.5	-	0.0	< 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							0.6
	Anthracene	mg/kg	0.5	-	0.6	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5							0.8
	Benzo(a)anthracene	mg/kg	0.5	-	0.6	< 0.5	< 0.5	1.4	< 0.5	< 0.5	< 0.5	< 0.5							3.4
	Benzo(a)pyrene	mg/kg	0.5	-	0.6	< 0.5	< 0.5	1.4	< 0.5	< 0.5	< 0.5	< 0.5							4
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7	< 0.5	< 0.5	1.9	< 0.5	< 0.5	< 0.5	< 0.5							5.2
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6	0.6	0.6	2.1	0.6	0.6	0.6	0.6							5.4
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2	1.2	1.2	2.4	1.2	1.2	1.2	1.2							5.7
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5	< 0.5	< 0.5	1.4	< 0.5	< 0.5	< 0.5	< 0.5							4
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5							2.7
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5							1.7
	Chrysene	mg/kg	0.5	-	1.0	< 0.5	< 0.5	1.2	< 0.5	< 0.5	< 0.5	< 0.5							4.1
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0	< 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	0.6	3.7	< 0.5	< 0.5	< 0.5	< 0.5							7.7
	Fluorene	mg/kg	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	-	0.6	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5							2.1
	Naphthalene	mg/kg	0.5	-	0.0	< 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	2.4	< 0.5	< 0.5	< 0.5	< 0.5							2.8
	Pyrene	mg/kg	0.5	-	0.5	< 0.5	0.5	3.4	< 0.5	< 0.5	< 0.5	< 0.5							8.2
	Total PAH (18)	mg/kg	0.5	-	1.1	< 0.5	1.1	18	< 0.5	< 0.5	< 0.5	< 0.5							42.1
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50			< 50				221
	TRH C10-C14	mg/kg	20	-	21.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20			< 20				< 20
	TRH C15-C28	mg/kg	50	-	54.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50			< 50				130
	TRH C29-C36	mg/kg	50	-	50.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50			< 50				91
	TRH C6-C9	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20			< 20				< 20
	Naphthalene	mg/kg	0.5	-	0.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5			< 0.5				< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50			< 50				< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0	< 50	< 50	< 50	< 50	< 50	< 50	< 50			< 50				< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0	< 100	< 100	< 100	< 100	< 100	< 100	< 100			< 100				190
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0	< 100	< 100	< 100	< 100	< 100	< 100	< 100			< 100				190
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0	< 100	< 100	< 100	< 100	< 100	< 100	< 100			< 100				< 100
	TRH C6-C10	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20			< 20				< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0	< 20	< 20	< 20	< 20	< 20	< 20	< 20			< 20				< 20
BTEX	Benzene	mg/kg	0.1	-	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1			< 0.1				< 0.1
	Ethylbenzene	mg/kg	0.1	-	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1			< 0.1				< 0.1
	m/p-xylene	mg/kg	0.2	-	0.0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2			< 0.2				< 0.2
	o-xylene	mg/kg	0.1	-	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1			< 0.1				< 0.1
	Toluene	mg/kg	0.1	-	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1			< 0.1				< 0.1
	Total Xylenes	mg/kg	0.3	-	0.0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3			< 0.3				< 0.3
PCB	Aroclor-1016	mg/kg	0.1	-	0.0														
	Aroclor-1221	mg/kg	0.1	-	0.0														
	Aroclor-1232	mg/kg	0.1	-	0.0														
	Aroclor-1242	mg/kg	0.1	-	0.0														
	Aroclor-1248	mg/kg	0.1	-	0.0														
	Aroclor-1254	mg/kg	0.1	-	0.0														
	Aroclor-1260	mg/kg	0.1	-	0.0														
	Total PCB*	mg/kg	0.1	7	0.0														
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0														
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0														
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethene	mg/kg	0.5	-	0.0														
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0														
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.2-Dibromoethane	mg/kg	0.5	-	0.0														
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.2-Dichloroethane	mg/kg	0.5	-	0.0														
	1.2-Dichloropropane	mg/kg	0.5	-	0.0														
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.3-Dichloropropane	mg/kg	0.5	-	0.0														
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0														

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0														
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0														
	4-Chlorotoluene	mg/kg	0.5	-	0.0														
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0														
	Allyl chloride	mg/kg	0.5	-	0.0														
	Benzene	mg/kg	0.1	-	0.0														
	Bromobenzene	mg/kg	0.5	-	0.0														
	Bromochloromethane	mg/kg	0.5	-	0.0														
	Bromodichloromethane	mg/kg	0.5	-	0.0														
	Bromoform	mg/kg	0.5	-	0.0														
	Bromomethane	mg/kg	0.5	-	0.0														
	Carbon disulfide	mg/kg	0.5	-	0.0														
	Carbon Tetrachloride	mg/kg	0.5	-	0.0														
	Chlorobenzene	mg/kg	0.5	-	0.0														
	Chloroethane	mg/kg	0.5	-	0.0														
	Chloroform	mg/kg	0.5	-	0.0														
	Chloromethane	mg/kg	0.5	-	0.0														
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Dibromochloromethane	mg/kg	0.5	-	0.0														
	Dibromomethane	mg/kg	0.5	-	0.0														
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0														
	Ethylbenzene	mg/kg	0.1	-	0.0														
	Iodomethane	mg/kg	0.5	-	0.0														
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0														
	m&p-Xylenes	mg/kg	0.2	-	0.0														
	Methylene Chloride	mg/kg	0.5	-	0.0														
	o-Xylene	mg/kg	0.1	-	0.0														
	Styrene	mg/kg	0.5	-	0.0														
	Tetrachloroethene	mg/kg	0.5	-	0.0														
	Toluene	mg/kg	0.1	-	0.0														
	Total MAH*	mg/kg	0.5	-	0.0														
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Trichloroethene	mg/kg	0.5	-	0.0														
	Trichlorofluoromethane	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0														
	Vinyl chloride	mg/kg	0.5	-	0.0														
	Xylenes - Total	mg/kg	0.3	-	0.0														
OCP	4.4 - DDD	mg/kg	0.05	-	0.0														
	4.4 - DDE	mg/kg	0.05		0.0														
	4.4 - DDT	mg/kg	0.05	-	0.0														
	a - BHC	mg/kg	0.05	-	0.0														
	Aldrin	mg/kg	0.05	-	0.1														
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1														
	b - BHC	mg/kg	0.05	-	0.0														
	Chlordanes (total)	mg/kg	0.05	530	0.4														
	d - BHC	mg/kg	0.05	-	0.0														
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0														
	Dieldrin	mg/kg	0.05	-	0.1														
	Endosulfan 1	mg/kg	0.05	-	0.0														
	Endosulfan 2	mg/kg	0.05	-	0.0														
	Endosulfan sulphate	mg/kg	0.05	-	0.0														
	Endrin	mg/kg	0.05	100	0.0														
	Endrin Aldehyde	mg/kg	0.05	-	0.0														
	Endrin Ketone	mg/kg	0.05	-	0.0														
	g-BHC (Lindane)	mg/kg	0.05	-	0.0														
	Heptachlor	mg/kg	0.05	50	0.1														
	Heptachlor epoxide	mg/kg	0.05	-	0.0														
	Hexachlorobenzene	mg/kg	0.05	80	0.0														
	Methoxychlor	mg/kg	0.05	2,500	0.0														
	Toxaphene	mg/kg	1.0	-	0.0														
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4														
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4														
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0														
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	NT	NT	No Detected	No Detected	NT	NT	Not Detected
Physical Parameters	pH	pH Units	0.1			5.4	7.4	7.7	5.2	4.8	4.7								
	Electrical Conductivity	dS/m	0.005			0.35	0.3	0.25	0.13	0.048	0.047								

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013 Commercial / Industrial D	Sample ID	BH03-0.6-0.8	BH04-0.15-0.3	BH04-0.7-0.9	BH04-1.3-1.5	BH05-0.0-0.2	BH06-0.2-0.4	BH13 0.0-0.2	BH13 0.8-1.0	BH13 1.5-1.7	BH13 1.9-2.1	BH14-0.0-0.2	BH14-0.7-0.9	BH14-1.0-1.2	BH15-0.2-0.4
					Reference	S19-Ja28094	S19-Ja28084	S19-Ja28091	S19-Ja28092	S19-Fe02484	S19-Ma01937	S19-Ma01938	S19-Ma01939	S19-Ma01940	S19-Ma01941	S19-Ja28082	S19-Ja28088	S19-Ja28089	S19-Ja28083
					Date Sampled	31/01/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019	28/02/2019	28/02/2019	28/02/2019	28/02/2019	28/02/2019	31/01/2019	31/01/2019	31/01/2019	31/01/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Data Set Minimum														
Metals	Arsenic, As	mg/kg	2	3,000	2.3	6.3	5.8	4.7	3.4	7.5	5.1	5.6	8.7	9.2	3.8	3.1	2.6	8.3	< 2
	Cadmium, Cd	mg/kg	0.4	500	0.4	1.1	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	mg/kg	5.0	3,600	5.2	19	9.6	14	16	14	9	18	21	27	17	17	6	25	< 5
	Copper, Cu	mg/kg	5.0	240,000	5.6	51	230	19	6	200	5.9	23	38	24	< 5	22	8.9	8.4	< 5
	Lead, Pb	mg/kg	5	1,500	6.1	2800	710	190	27	380	33	160	100	110	10	410	150	160	6.1
	Mercury (inorganic)	mg/kg	0.10	730	0.1	0.9	0.4	0.2	0.1	0.4	< 0.1	0.5	0.8	0.7	0.1	0.3	0.2	< 0.1	< 0.1
	Nickel, Ni	mg/kg	5.0	6,000	5.4	16	28	6.1	< 5	6.7	< 5	10	11	12	< 5	7.4	< 5	< 5	< 5
	Zinc, Zn	mg/kg	5.0	400,000	5.2	810	590	180	25	340	9.8	120	83	84	6	150	39	42	< 5
PAH	Acenaphthene	mg/kg	0.5	-	0.0		< 0.5									< 0.5			< 0.5
	Acenaphthylene	mg/kg	0.5	-	0.5		< 0.5									0.5			< 0.5
	Anthracene	mg/kg	0.5	-	0.6		< 0.5									0.9			< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	0.6		1									2.4			< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.6		1.3									2.3			< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7		1.7									3			< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6		1.9									3.3			0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2		2.2									3.5			1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5		1.3									2.3			< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8		0.9									1.7			< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5		0.5									1			< 0.5
	Chrysene	mg/kg	0.5	-	1.0		1.2									2.6			< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0		< 0.5									< 0.5			< 0.5
	Fluoranthene	mg/kg	0.5	-	0.5		2.3									5.7			< 0.5
	Fluorene	mg/kg	0.5	-	0.5		< 0.5									< 0.5			< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6		0.7									1.2			< 0.5
	Naphthalene	mg/kg	0.5	-	0.0		< 0.5									< 0.5			< 0.5
	Phenanthrene	mg/kg	0.5	-	0.5		1									4.7			< 0.5
	Pyrene	mg/kg	0.5	-	0.5		2.4									6.1			< 0.5
	Total PAH (18)	mg/kg	0.5	-	1.1		12.6									31.4			< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0		< 50					< 50				290			80
	TRH C10-C14	mg/kg	20	-	21.0		< 20					< 20				< 20			< 20
	TRH C15-C28	mg/kg	50	-	54.0		< 50					< 50				150			80
	TRH C29-C36	mg/kg	50	-	50.0		< 50					< 50				140			< 50
	TRH C6-C9	mg/kg	20	-	0.0		< 20					< 20				< 20			< 20
	Naphthalene	mg/kg	0.5	-	0.0		< 0.5					< 0.5				< 0.5			< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0		< 50					< 50				< 50			< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0		< 50					< 50				< 50			< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0		< 100					< 100				260			< 100
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0		< 100					< 100				260			< 100
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0		< 100					< 100				< 100			< 100
	TRH C6-C10	mg/kg	20	-	0.0		< 20					< 20				< 20			< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0		< 20					< 20				< 20			< 20
BTEX	Benzene	mg/kg	0.1	-	0.0		< 0.1					< 0.1				< 0.1			< 0.1
	Ethylbenzene	mg/kg	0.1	-	0.0		< 0.1					< 0.1				< 0.1			< 0.1
	m/p-xylene	mg/kg	0.2	-	0.0		< 0.2					< 0.2				< 0.2			< 0.2
	o-xylene	mg/kg	0.1	-	0.0		< 0.1					< 0.1				< 0.1			< 0.1
	Toluene	mg/kg	0.1	-	0.0		< 0.1					< 0.1				< 0.1			< 0.1
	Total Xylenes	mg/kg	0.3	-	0.0		< 0.3					< 0.3				< 0.3			< 0.3
PCB	Aroclor-1016	mg/kg	0.1	-	0.0														
	Aroclor-1221	mg/kg	0.1	-	0.0														
	Aroclor-1232	mg/kg	0.1	-	0.0														
	Aroclor-1242	mg/kg	0.1	-	0.0														
	Aroclor-1248	mg/kg	0.1	-	0.0														
	Aroclor-1254	mg/kg	0.1	-	0.0														
	Aroclor-1260	mg/kg	0.1	-	0.0														
	Total PCB*	mg/kg	0.1	7	0.0														
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0														
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0														
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethene	mg/kg	0.5	-	0.0														
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0														
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.2-Dibromoethane	mg/kg	0.5	-	0.0														
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.2-Dichloroethane	mg/kg	0.5	-	0.0														
	1.2-Dichloropropane	mg/kg	0.5	-	0.0														
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.3-Dichloropropane	mg/kg	0.5	-	0.0														
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0														

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0														
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0														
	4-Chlorotoluene	mg/kg	0.5	-	0.0														
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0														
	Allyl chloride	mg/kg	0.5	-	0.0														
	Benzene	mg/kg	0.1	-	0.0														
	Bromobenzene	mg/kg	0.5	-	0.0														
	Bromochloromethane	mg/kg	0.5	-	0.0														
	Bromodichloromethane	mg/kg	0.5	-	0.0														
	Bromoform	mg/kg	0.5	-	0.0														
	Bromomethane	mg/kg	0.5	-	0.0														
	Carbon disulfide	mg/kg	0.5	-	0.0														
	Carbon Tetrachloride	mg/kg	0.5	-	0.0														
	Chlorobenzene	mg/kg	0.5	-	0.0														
	Chloroethane	mg/kg	0.5	-	0.0														
	Chloroform	mg/kg	0.5	-	0.0														
	Chloromethane	mg/kg	0.5	-	0.0														
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Dibromochloromethane	mg/kg	0.5	-	0.0														
	Dibromomethane	mg/kg	0.5	-	0.0														
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0														
	Ethylbenzene	mg/kg	0.1	-	0.0														
	Iodomethane	mg/kg	0.5	-	0.0														
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0														
	m&p-Xylenes	mg/kg	0.2	-	0.0														
	Methylene Chloride	mg/kg	0.5	-	0.0														
	o-Xylene	mg/kg	0.1	-	0.0														
	Styrene	mg/kg	0.5	-	0.0														
	Tetrachloroethene	mg/kg	0.5	-	0.0														
	Toluene	mg/kg	0.1	-	0.0														
	Total MAH*	mg/kg	0.5	-	0.0														
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Trichloroethene	mg/kg	0.5	-	0.0														
	Trichlorofluoromethane	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0														
	Vinyl chloride	mg/kg	0.5	-	0.0														
	Xylenes - Total	mg/kg	0.3	-	0.0														
OCP	4.4 - DDD	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	4.4 - DDE	mg/kg	0.05		0.0							< 0.05				< 0.05			< 0.05
	4.4 - DDT	mg/kg	0.05	-	0.0							< 0.05				< 0.2			< 0.05
	a - BHC	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Aldrin	mg/kg	0.05	-	0.1							< 0.05				< 0.05			< 0.05
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1							< 0.05				< 0.05			< 0.05
	b - BHC	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Chlordanes (total)	mg/kg	0.05	530	0.4							< 0.1				< 0.1			< 0.1
	d - BHC	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0							< 0.05				< 0.2			< 0.05
	Dieldrin	mg/kg	0.05	-	0.1							< 0.05				< 0.05			< 0.05
	Endosulfan 1	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Endosulfan 2	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Endosulfan sulphate	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Endrin	mg/kg	0.05	100	0.0							< 0.05				< 0.05			< 0.05
	Endrin Aldehyde	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Endrin Ketone	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	g-BHC (Lindane)	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Heptachlor	mg/kg	0.05	50	0.1							< 0.05				< 0.05			< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	0.0							< 0.05				< 0.05			< 0.05
	Hexachlorobenzene	mg/kg	0.05	80	0.0							< 0.05				< 0.05			< 0.05
	Methoxychlor	mg/kg	0.05	2,500	0.0							< 0.2				< 0.2			< 0.2
	Toxaphene	mg/kg	1.0	-	0.0							< 1				< 1			< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4							< 0.2				< 0.2			< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4							< 0.2				< 0.2			< 0.2
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0														
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		Not Detected	Not Detected	Not Detected	NT	NT	NT	No Detected	No Detected	No Detected	NT	Not Detected	Not Detected	NT	Not Detected
Physical Parameters	pH	pH Units	0.1																
	Electrical Conductivity	dS/m	0.005																

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013	Sample ID	BH15-0.6-0.8	BH16-0.1-0.3	BH16-0.6-0.8	BH16-1.3-1.5	BH16-1.8-2.0	BH17 0.2-0.4	BH17 0.9-1.1	BH17 1.5-1.7	BH19-0.0-0.2	BH19-0.6-0.8	BH20-0.0-0.2	BH20-0.7-0.9	BH21A-0.0-0.2	BH21A-0.7-0.9
					Reference	S19-Ja28090	S19-Ma03546	S19-Ma03547	S19-Ma03548	S19-Ma03549	S19-Ma01942	S19-Ma01943	S19-Ma01944	S19-Ma01952	S19-Ma01953	S19-Ja28085	S19-Ja28093	S19-Ma01945	S19-Ma01946
					Date Sampled	31/01/2019	1/03/2019	1/03/2019	1/03/2019	1/03/2019	28/02/2019	28/02/2019	28/02/2019	28/02/2019	28/02/2019	31/01/2019	31/01/2019	28/02/2019	28/02/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Commercial / Industrial D	Data Set Minimum														
Metals	Arsenic, As	mg/kg	2	3,000	2.3	8.7	2.8	5.6	9.2	3.9	7.3	5	11	20	10	4	4.9		
	Cadmium, Cd	mg/kg	0.4	500	0.4	13	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	1.3	9.5	< 0.4	< 0.4	< 0.4	< 0.4		
	Chromium, Cr	mg/kg	5.0	3,600	5.2	150	32	17	28	19	23	27	170	88	35	12	15		
	Copper, Cu	mg/kg	5.0	240,000	5.6	150	15	51	12	10	17	14	200	7.8	< 5	280	130		
	Lead, Pb	mg/kg	5	1,500	6.1	23	26	210	63	15	95	57	35	58	19	270	150	820	40
	Mercury (inorganic)	mg/kg	0.10	730	0.1	0.3	0.2	0.6	0.1	< 0.1	0.3	0.2	0.2	0.1	< 0.1	0.4	0.2		
	Nickel, Ni	mg/kg	5.0	6,000	5.4	13	< 5	5.4	< 5	< 5	6.5	< 5	27	< 5	< 5	5.5	< 5		
	Zinc, Zn	mg/kg	5.0	400,000	5.2	96	32	97	34	12	48	25	98	15	5.3	520	230		
PAH	Acenaphthene	mg/kg	0.5	-	0.0			< 0.5	< 0.5							< 0.5			
	Acenaphthylene	mg/kg	0.5	-	0.5			< 0.5	< 0.5							< 0.5			
	Anthracene	mg/kg	0.5	-	0.6			< 0.5	< 0.5							< 0.5			
	Benzo(a)anthracene	mg/kg	0.5	-	0.6			< 0.5	< 0.5							0.9			
	Benzo(a)pyrene	mg/kg	0.5	-	0.6			< 0.5	< 0.5							1.1			
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7			< 0.5	< 0.5							1.4			
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6			0.6	0.6							1.7			
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2			1.2	1.2							1.9			
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5			0.5	< 0.5							1.2			
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8			< 0.5	< 0.5							0.8			
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5			< 0.5	< 0.5							< 0.5			
	Chrysene	mg/kg	0.5	-	1.0			< 0.5	< 0.5							1			
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0			< 0.5	< 0.5							< 0.5			
	Fluoranthene	mg/kg	0.5	-	0.5			0.5	< 0.5							1.6			
	Fluorene	mg/kg	0.5	-	0.5			< 0.5	< 0.5							< 0.5			
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6			< 0.5	< 0.5							0.6			
	Naphthalene	mg/kg	0.5	-	0.0			< 0.5	< 0.5							< 0.5			
	Phenanthrene	mg/kg	0.5	-	0.5			< 0.5	< 0.5							0.5			
	Pyrene	mg/kg	0.5	-	0.5			0.5	< 0.5							1.8			
	Total PAH (18)	mg/kg	0.5	-	1.1			1.5	< 0.5							9.5			
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0		136	< 50	< 50		< 50			< 50		< 50			
	TRH C10-C14	mg/kg	20	-	21.0		< 20	< 20	< 20		< 20			< 20		< 20			
	TRH C15-C28	mg/kg	50	-	54.0		80	< 50	< 50		< 50			< 50		< 50			
	TRH C29-C36	mg/kg	50	-	50.0		56	< 50	< 50		< 50			< 50		< 50			
	TRH C6-C9	mg/kg	20	-	0.0		< 20	< 20	< 20		< 20			< 20		< 20			
	Naphthalene	mg/kg	0.5	-	0.0		< 0.5	< 0.5	< 0.5		< 0.5			< 0.5		< 0.5			
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0		< 50	< 50	< 50		< 50			< 50		< 50			
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0		< 50	< 50	< 50		< 50			< 50		< 50			
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0		120	< 100	< 100		< 100			< 100		< 100			
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0		120	< 100	< 100		< 100			< 100		< 100			
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0		< 100	< 100	< 100		< 100			< 100		< 100			
	TRH C6-C10	mg/kg	20	-	0.0		< 20	< 20	< 20		< 20			< 20		< 20			
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0		< 20	< 20	< 20		< 20			< 20		< 20			
BTEX	Benzene	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1		< 0.1			< 0.1		< 0.1			
	Ethylbenzene	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1		< 0.1			< 0.1		< 0.1			
	m/p-xylene	mg/kg	0.2	-	0.0		< 0.2	< 0.2	< 0.2		< 0.2			< 0.2		< 0.2			
	o-xylene	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1		< 0.1			< 0.1		< 0.1			
	Toluene	mg/kg	0.1	-	0.0		< 0.1	< 0.1	< 0.1		< 0.1			< 0.1		< 0.1			
	Total Xylenes	mg/kg	0.3	-	0.0		< 0.3	< 0.3	< 0.3		< 0.3			< 0.3		< 0.3			
PCB	Aroclor-1016	mg/kg	0.1	-	0.0														
	Aroclor-1221	mg/kg	0.1	-	0.0														
	Aroclor-1232	mg/kg	0.1	-	0.0														
	Aroclor-1242	mg/kg	0.1	-	0.0														
	Aroclor-1248	mg/kg	0.1	-	0.0														
	Aroclor-1254	mg/kg	0.1	-	0.0														
	Aroclor-1260	mg/kg	0.1	-	0.0														
	Total PCB*	mg/kg	0.1	7	0.0														
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0														
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0														
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethane	mg/kg	0.5	-	0.0														
	1.1-Dichloroethene	mg/kg	0.5	-	0.0														
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0														
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.2-Dibromoethane	mg/kg	0.5	-	0.0														
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.2-Dichloroethane	mg/kg	0.5	-	0.0														
	1.2-Dichloropropane	mg/kg	0.5	-	0.0														
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0														
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0														
	1.3-Dichloropropane	mg/kg	0.5	-	0.0														
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0														

	2-Butanone (MEK)	mg/kg	0.5	-	0.0														
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0														
	4-Chlorotoluene	mg/kg	0.5	-	0.0														
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0														
	Allyl chloride	mg/kg	0.5	-	0.0														
	Benzene	mg/kg	0.1	-	0.0														
	Bromobenzene	mg/kg	0.5	-	0.0														
	Bromochloromethane	mg/kg	0.5	-	0.0														
	Bromodichloromethane	mg/kg	0.5	-	0.0														
	Bromoform	mg/kg	0.5	-	0.0														
	Bromomethane	mg/kg	0.5	-	0.0														
VOC	Carbon disulfide	mg/kg	0.5	-	0.0														
	Carbon Tetrachloride	mg/kg	0.5	-	0.0														
	Chlorobenzene	mg/kg	0.5	-	0.0														
	Chloroethane	mg/kg	0.5	-	0.0														
	Chloroform	mg/kg	0.5	-	0.0														
	Chloromethane	mg/kg	0.5	-	0.0														
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Dibromochloromethane	mg/kg	0.5	-	0.0														
	Dibromomethane	mg/kg	0.5	-	0.0														
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0														
	Ethylbenzene	mg/kg	0.1	-	0.0														
	Iodomethane	mg/kg	0.5	-	0.0														
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0														
	m&p-Xylenes	mg/kg	0.2	-	0.0														
	Methylene Chloride	mg/kg	0.5	-	0.0														
	o-Xylene	mg/kg	0.1	-	0.0														
	Styrene	mg/kg	0.5	-	0.0														
	Tetrachloroethene	mg/kg	0.5	-	0.0														
	Toluene	mg/kg	0.1	-	0.0														
	Total MAH*	mg/kg	0.5	-	0.0														
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0														
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0														
	Trichloroethene	mg/kg	0.5	-	0.0														
	Trichlorofluoromethane	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0														
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0														
	Vinyl chloride	mg/kg	0.5	-	0.0														
	Xylenes - Total	mg/kg	0.3	-	0.0														
	4.4 - DDD	mg/kg	0.05	-	0.0														
	4.4 - DDE	mg/kg	0.05		0.0														
	4.4 - DDT	mg/kg	0.05	-	0.0														
	a - BHC	mg/kg	0.05	-	0.0														
	Aldrin	mg/kg	0.05	-	0.1														
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1														
	b - BHC	mg/kg	0.05	-	0.0														
	Chlordanes (total)	mg/kg	0.05	530	0.4														
	d - BHC	mg/kg	0.05	-	0.0														
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0														
	Dieldrin	mg/kg	0.05	-	0.1														
	Endosulfan 1	mg/kg	0.05	-	0.0														
OCP	Endosulfan 2	mg/kg	0.05	-	0.0														
	Endosulfan sulphate	mg/kg	0.05	-	0.0														
	Endrin	mg/kg	0.05	100	0.0														
	Endrin Aldehyde	mg/kg	0.05	-	0.0														
	Endrin Ketone	mg/kg	0.05	-	0.0														
	g-BHC (Lindane)	mg/kg	0.05	-	0.0														
	Heptachlor	mg/kg	0.05	50	0.1														
	Heptachlor epoxide	mg/kg	0.05	-	0.0														
	Hexachlorobenzene	mg/kg	0.05	80	0.0														
	Methoxychlor	mg/kg	0.05	2,500	0.0														
	Toxaphene	mg/kg	1.0	-	0.0														
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4														
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4														
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0														
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		NT	No Detected	No Detected	No Detected	NT	No Detected	No Detected	NT	No Detected	NT	Not Detected	NT	NT	NT
Physical Parameters	pH	pH Units	0.1																
	Electrical Conductivity	dS/m	0.005																

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013	Sample ID	BH21B-0.05-0.2	BH21B-0.7-0.9	BH21C-0.0-0.2	BH21C-0.7-0.9	BH21C-1.3-1.5	TANK01-01	TANK01-02	TANK01-03	TANK01-04	TANK01-05
					Reference	S19-Ma01947	S19-Ma01948	S19-Ma01949	S19-Ma01950	S19-Ma01951	S19-Fe22292	S19-Fe22293	S19-Fe22294	S19-Fe22295	S19-Fe22296
					Date Sampled	28/02/2019	28/02/2019	28/02/2019	28/02/2019	28/02/2019	15/02/2019	15/02/2019	15/02/2019	15/02/2019	15/02/2019
					Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Commercial / Industrial D	Data Set Minimum										
Metals	Arsenic, As	mg/kg	2	3,000	2.3		9.3				10	8.8	7.9	18	12
	Cadmium, Cd	mg/kg	0.4	500	0.4		1.6				< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium, Cr	mg/kg	5.0	3,600	5.2		24				24	29	29	41	30
	Copper, Cu	mg/kg	5.0	240,000	5.6		160				6.4	22	9	18	29
	Lead, Pb	mg/kg	5	1,500	6.1	900	25	2400	1300	44	34	110	53	120	170
	Mercury (inorganic)	mg/kg	0.10	730	0.1		1.6				< 0.1	0.3	< 0.1	0.1	0.2
	Nickel, Ni	mg/kg	5.0	6,000	5.4		25				< 5	6.8	6.2	6.6	7.6
	Zinc, Zn	mg/kg	5.0	400,000	5.2		1000				51	190	66	97	370
PAH	Acenaphthene	mg/kg	0.5	-	0.0						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5	-	0.5						1.1	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	-	0.6						1.4	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	0.6						1.8	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	0.6						1.3	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7						1.7	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	0.6						2	0.6	0.6	0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	1.2						2.3	1.2	1.2	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	0.5						0.7	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	0.8						0.7	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5						1.3	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	1.0						1.7	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	-	0.5						5.6	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5	-	0.5						0.9	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	-	0.0						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	-	0.5						6.8	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5	-	0.5						4.7	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	-	1.1						28	< 0.5	< 0.5	< 0.5	< 0.5
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0						219	354	421	139	< 50
	TRH C10-C14	mg/kg	20	-	21.0						29	54	61	29	< 20
	TRH C15-C28	mg/kg	50	-	54.0						190	300	360	110	< 50
	TRH C29-C36	mg/kg	50	-	50.0						< 50	< 50	< 50	< 50	< 50
	TRH C6-C9	mg/kg	20	-	0.0						< 20	< 20	< 20	< 20	< 20
	Naphthalene	mg/kg	0.5	-	0.0						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0						< 50	110	120	< 50	< 50
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0						< 50	110	120	< 50	< 50
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0						200	380	450	110	< 100
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0						200	270	330	110	< 100
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0						< 100	< 100	< 100	< 100	< 100
	TRH C6-C10	mg/kg	20	-	0.0						< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0						< 20	< 20	< 20	< 20	< 20
BTEX	Benzene	mg/kg	0.1	-	0.0						< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	-	0.0						< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	m/p-xylene	mg/kg	0.2	-	0.0						< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	o-xylene	mg/kg	0.1	-	0.0						< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1	-	0.0						< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Total Xylenes	mg/kg	0.3	-	0.0						< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB	Aroclor-1016	mg/kg	0.1	-	0.0										
	Aroclor-1221	mg/kg	0.1	-	0.0										
	Aroclor-1232	mg/kg	0.1	-	0.0										
	Aroclor-1242	mg/kg	0.1	-	0.0										
	Aroclor-1248	mg/kg	0.1	-	0.0										
	Aroclor-1254	mg/kg	0.1	-	0.0										
	Aroclor-1260	mg/kg	0.1	-	0.0										
	Total PCB*	mg/kg	0.1	7	0.0										
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0										
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0										
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0										
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0										
	1.1-Dichloroethane	mg/kg	0.5	-	0.0										
	1.1-Dichloroethene	mg/kg	0.5	-	0.0										
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0										
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0										
	1.2-Dibromoethane	mg/kg	0.5	-	0.0										
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0										
	1.2-Dichloroethane	mg/kg	0.5	-	0.0										
	1.2-Dichloropropane	mg/kg	0.5	-	0.0										
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0										
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0										
	1.3-Dichloropropane	mg/kg	0.5	-	0.0										
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0										

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0										
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0										
	4-Chlorotoluene	mg/kg	0.5	-	0.0										
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0										
	Allyl chloride	mg/kg	0.5	-	0.0										
	Benzene	mg/kg	0.1	-	0.0										
	Bromobenzene	mg/kg	0.5	-	0.0										
	Bromochloromethane	mg/kg	0.5	-	0.0										
	Bromodichloromethane	mg/kg	0.5	-	0.0										
	Bromoform	mg/kg	0.5	-	0.0										
	Bromomethane	mg/kg	0.5	-	0.0										
	Carbon disulfide	mg/kg	0.5	-	0.0										
	Carbon Tetrachloride	mg/kg	0.5	-	0.0										
	Chlorobenzene	mg/kg	0.5	-	0.0										
	Chloroethane	mg/kg	0.5	-	0.0										
	Chloroform	mg/kg	0.5	-	0.0										
	Chloromethane	mg/kg	0.5	-	0.0										
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0										
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0										
	Dibromochloromethane	mg/kg	0.5	-	0.0										
	Dibromomethane	mg/kg	0.5	-	0.0										
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0										
	Ethylbenzene	mg/kg	0.1	-	0.0										
	Iodomethane	mg/kg	0.5	-	0.0										
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0										
	m&p-Xylenes	mg/kg	0.2	-	0.0										
	Methylene Chloride	mg/kg	0.5	-	0.0										
	o-Xylene	mg/kg	0.1	-	0.0										
	Styrene	mg/kg	0.5	-	0.0										
	Tetrachloroethene	mg/kg	0.5	-	0.0										
	Toluene	mg/kg	0.1	-	0.0										
	Total MAH*	mg/kg	0.5	-	0.0										
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0										
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0										
	Trichloroethene	mg/kg	0.5	-	0.0										
	Trichlorofluoromethane	mg/kg	0.5	-	0.0										
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0										
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0										
	Vinyl chloride	mg/kg	0.5	-	0.0										
	Xylenes - Total	mg/kg	0.3	-	0.0										
OCP	4.4 - DDD	mg/kg	0.05	-	0.0										
	4.4 - DDE	mg/kg	0.05		0.0										
	4.4 - DDT	mg/kg	0.05	-	0.0										
	a - BHC	mg/kg	0.05	-	0.0										
	Aldrin	mg/kg	0.05	-	0.1										
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1										
	b - BHC	mg/kg	0.05	-	0.0										
	Chlordanes (total)	mg/kg	0.05	530	0.4										
	d - BHC	mg/kg	0.05	-	0.0										
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0										
	Dieldrin	mg/kg	0.05	-	0.1										
	Endosulfan 1	mg/kg	0.05	-	0.0										
	Endosulfan 2	mg/kg	0.05	-	0.0										
	Endosulfan sulphate	mg/kg	0.05	-	0.0										
	Endrin	mg/kg	0.05	100	0.0										
	Endrin Aldehyde	mg/kg	0.05	-	0.0										
	Endrin Ketone	mg/kg	0.05	-	0.0										
	g-BHC (Lindane)	mg/kg	0.05	-	0.0										
	Heptachlor	mg/kg	0.05	50	0.1										
	Heptachlor epoxide	mg/kg	0.05	-	0.0										
	Hexachlorobenzene	mg/kg	0.05	80	0.0										
	Methoxychlor	mg/kg	0.05	2,500	0.0										
	Toxaphene	mg/kg	1.0	-	0.0										
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4										
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4										
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0										
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Physical Parameters	pH	pH Units	0.1												
	Electrical Conductivity	dS/m	0.005												

	Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
-	No published criteria
NL	Not Limiting
NT	Not Tested

Table LAR1
Pyrmont Bridge Road (PBR) Site
Soil Results & Adopted Site Criteria
7921-ER-1-3

Group	Analyte	Units	PQL	Health Investigation Levels for Soil Contaminants - NEPC 2013 Commercial / Industrial D	Sample ID / Reference / Date Sampled / Sample Matrix Data Set Minimum
Metals	Arsenic, As	mg/kg	2	3,000	2.3
	Cadmium, Cd	mg/kg	0.4	500	0.4
	Chromium, Cr	mg/kg	5.0	3,600	5.2
	Copper, Cu	mg/kg	5.0	240,000	5.6
	Lead, Pb	mg/kg	5	1,500	6.1
	Mercury (inorganic)	mg/kg	0.10	730	0.1
	Nickel, Ni	mg/kg	5.0	6,000	5.4
	Zinc, Zn	mg/kg	5.0	400,000	5.2
PAH	Acenaphthene	mg/kg	0.5	-	0.0
	Acenaphthylene	mg/kg	0.5	-	0.5
	Anthracene	mg/kg	0.5	-	0.6
	Benzo(a)anthracene	mg/kg	0.5	-	0.6
	Benzo(a)pyrene	mg/kg	0.5	-	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	0.7
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	40	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	-	0.8
	Benzo(k)fluoranthene	mg/kg	0.5	-	0.5
	Chrysene	mg/kg	0.5	-	1.0
	Dibenzo(ah)anthracene	mg/kg	0.5	-	0.0
	Fluoranthene	mg/kg	0.5	-	0.5
	Fluorene	mg/kg	0.5	-	0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	0.6
	Naphthalene	mg/kg	0.5	-	0.0
	Phenanthrene	mg/kg	0.5	-	0.5
	Pyrene	mg/kg	0.5	-	0.5
	Total PAH (18)	mg/kg	0.5	-	1.1
TRH	TRH C10-C36 Total	mg/kg	50	-	54.0
	TRH C10-C14	mg/kg	20	-	21.0
	TRH C15-C28	mg/kg	50	-	54.0
	TRH C29-C36	mg/kg	50	-	50.0
	TRH C6-C9	mg/kg	20	-	0.0
	Naphthalene	mg/kg	0.5	-	0.0
	TRH >C10-C16 (F2)	mg/kg	50	-	60.0
	TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	-	60.0
	TRH C10-C40 Total (F bands)	mg/kg	100	-	110.0
	TRH >C16-C34 (F3)	mg/kg	100	-	110.0
	TRH >C34-C40 (F4)	mg/kg	100	-	140.0
	TRH C6-C10	mg/kg	20	-	0.0
	TRH C6-C10 minus BTEX (F1)	mg/kg	20	-	0.0
BTEX	Benzene	mg/kg	0.1	-	0.0
	Ethylbenzene	mg/kg	0.1	-	0.0
	m/p-xylene	mg/kg	0.2	-	0.0
	o-xylene	mg/kg	0.1	-	0.0
	Toluene	mg/kg	0.1	-	0.0
	Total Xylenes	mg/kg	0.3	-	0.0
PCB	Aroclor-1016	mg/kg	0.1	-	0.0
	Aroclor-1221	mg/kg	0.1	-	0.0
	Aroclor-1232	mg/kg	0.1	-	0.0
	Aroclor-1242	mg/kg	0.1	-	0.0
	Aroclor-1248	mg/kg	0.1	-	0.0
	Aroclor-1254	mg/kg	0.1	-	0.0
	Aroclor-1260	mg/kg	0.1	-	0.0
	Total PCB*	mg/kg	0.1	7	0.0
	1.1.1.2-Tetrachloroethane	mg/kg	0.5		0.0
	1.1.1-Trichloroethane	mg/kg	0.5	-	0.0
	1.1.2.2-Tetrachloroethane	mg/kg	0.5	-	0.0
	1.1.2-Trichloroethane	mg/kg	0.5	-	0.0
	1.1-Dichloroethane	mg/kg	0.5	-	0.0
	1.1-Dichloroethene	mg/kg	0.5	-	0.0
	1.2.3-Trichloropropane	mg/kg	0.5	-	0.0
	1.2.4-Trimethylbenzene	mg/kg	0.5	-	0.0
	1.2-Dibromoethane	mg/kg	0.5	-	0.0
	1.2-Dichlorobenzene	mg/kg	0.5	-	0.0
	1.2-Dichloroethane	mg/kg	0.5	-	0.0
	1.2-Dichloropropane	mg/kg	0.5	-	0.0
	1.3.5-Trimethylbenzene	mg/kg	0.5	-	0.0
	1.3-Dichlorobenzene	mg/kg	0.5	-	0.0
	1.3-Dichloropropane	mg/kg	0.5	-	0.0
	1.4-Dichlorobenzene	mg/kg	0.5	-	0.0

VOC	2-Butanone (MEK)	mg/kg	0.5	-	0.0
	2-Propanone (Acetone)	mg/kg	0.5	-	0.0
	4-Chlorotoluene	mg/kg	0.5	-	0.0
	4-Methyl-2-pentanone (MIBK)	mg/kg	0.5	-	0.0
	Allyl chloride	mg/kg	0.5	-	0.0
	Benzene	mg/kg	0.1	-	0.0
	Bromobenzene	mg/kg	0.5	-	0.0
	Bromochloromethane	mg/kg	0.5	-	0.0
	Bromodichloromethane	mg/kg	0.5	-	0.0
	Bromoform	mg/kg	0.5	-	0.0
	Bromomethane	mg/kg	0.5	-	0.0
	Carbon disulfide	mg/kg	0.5	-	0.0
	Carbon Tetrachloride	mg/kg	0.5	-	0.0
	Chlorobenzene	mg/kg	0.5	-	0.0
	Chloroethane	mg/kg	0.5	-	0.0
	Chloroform	mg/kg	0.5	-	0.0
	Chloromethane	mg/kg	0.5	-	0.0
	cis-1.2-Dichloroethene	mg/kg	0.5	-	0.0
	cis-1.3-Dichloropropene	mg/kg	0.5	-	0.0
	Dibromochloromethane	mg/kg	0.5	-	0.0
	Dibromomethane	mg/kg	0.5	-	0.0
	Dichlorodifluoromethane	mg/kg	0.5	-	0.0
	Ethylbenzene	mg/kg	0.1	-	0.0
	Iodomethane	mg/kg	0.5	-	0.0
	Isopropyl benzene (Cumene)	mg/kg	0.5	-	0.0
	m&p-Xylenes	mg/kg	0.2	-	0.0
	Methylene Chloride	mg/kg	0.5	-	0.0
	o-Xylene	mg/kg	0.1	-	0.0
	Styrene	mg/kg	0.5	-	0.0
	Tetrachloroethene	mg/kg	0.5	-	0.0
	Toluene	mg/kg	0.1	-	0.0
	Total MAH*	mg/kg	0.5	-	0.0
	trans-1.2-Dichloroethene	mg/kg	0.5	-	0.0
	trans-1.3-Dichloropropene	mg/kg	0.5	-	0.0
	Trichloroethene	mg/kg	0.5	-	0.0
	Trichlorofluoromethane	mg/kg	0.5	-	0.0
	Vic EPA IWRG 621 CHC (Total)*	mg/kg	0.5	-	0.0
	Vic EPA IWRG 621 Other CHC (Total)*	mg/kg	0.5	-	0.0
	Vinyl chloride	mg/kg	0.5	-	0.0
	Xylenes - Total	mg/kg	0.3	-	0.0
OCP	4.4 - DDD	mg/kg	0.05	-	0.0
	4.4 - DDE	mg/kg	0.05		0.0
	4.4 - DDT	mg/kg	0.05	-	0.0
	a - BHC	mg/kg	0.05	-	0.0
	Aldrin	mg/kg	0.05	-	0.1
	Aldrin + Dieldrin (total)	mg/kg	0.05	45	0.1
	b - BHC	mg/kg	0.05	-	0.0
	Chlordanes (total)	mg/kg	0.05	530	0.4
	d - BHC	mg/kg	0.05	-	0.0
	DDT + DDE + DDD (total)	mg/kg	0.05	3,600	0.0
	Dieldrin	mg/kg	0.05	-	0.1
	Endosulfan 1	mg/kg	0.05	-	0.0
	Endosulfan 2	mg/kg	0.05	-	0.0
	Endosulfan sulphate	mg/kg	0.05	-	0.0
	Endrin	mg/kg	0.05	100	0.0
	Endrin Aldehyde	mg/kg	0.05	-	0.0
	Endrin Ketone	mg/kg	0.05	-	0.0
	g-BHC (Lindane)	mg/kg	0.05	-	0.0
	Heptachlor	mg/kg	0.05	50	0.1
	Heptachlor epoxide	mg/kg	0.05	-	0.0
	Hexachlorobenzene	mg/kg	0.05	80	0.0
	Methoxychlor	mg/kg	0.05	2,500	0.0
	Toxaphene	mg/kg	1.0	-	0.0
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	0.4
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	0.4
	Alpha + Beta Endosulfan	mg/kg	0.05	2,000	0.0
Asbestos	Asbestos detection in soil	% w/w	0.01	Detected	
Physical Parameters	pH	pH Units	0.1		
	Electrical Conductivity	dS/m	0.005		

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

- No published criteria

NL Not Limiting

NT Not Tested

Table LAR2
Pyrmont Bridge Road (PBR) Site
Groundwater Results
8272-ER-1-3

		Sample ID	GW02	GW04	GW06	WATER PIT
		Reference	S19-Ma19580	S19-Ma19581	S19-Ma19582	S19-Fe10202
		Date Sampled	14/3/2019	14/3/2019	14/3/2019	8/02/2019
		Sample Matrix	Water	Water	Water	WATER
	ANZECC & ARMCANZ (2000)					
	Fresh Waters (mg/L)	Marine Waters (mg/L)				
Metals/Metalloids						
Arsenic, As (V)	0.013	-	< 0.001	0.006	< 0.001	0.006
Cadmium, Cd	0.0002	0.001	< 0.0002	< 0.0002	0.05	0.0003
Chromium, Cr(III)	-	0.027	0.003	0.001	0.096	0.001
Copper, Cu	0.0014	0.0013	< 0.001	0.034	0.022	0.028
Lead, Pb	0.0034	0.0044	0.001	0.05	< 0.001	0.26
Mercury (Total), Hg	0.00006	0.0001	< 0.0001	< 0.0001	< 0.0001	0.0001
Nickel, Ni	0.011	0.007	0.002	0.004	0.058	0.003
Zinc, Zn	0.008	0.015	< 0.005	0.013	0.025	0.36
Monocyclic Aromatic Hydrocarbons						
Benzene	1	0.5	< 0.001	< 0.001	< 0.001	-
Toluene	-	-	< 0.001	0.001	< 0.001	-
Ethylbenzene	-	-	< 0.001	< 0.001	< 0.001	-
Xylenes	0.35 (as o-xylene)	-	< 0.001	< 0.001	< 0.001	-
Xylenes	0.2 (as p-xylene)	-	< 0.002	< 0.002	< 0.002	-
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	0.016	0.05	< 0.001	< 0.001	< 0.001	< 0.001
Benzo[a]pyrene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Phenols						
Phenol	0.32	0.4	< 0.003	< 0.003	< 0.003	-
2-Chlorophenol	0.34	-	< 0.003	< 0.003	< 0.003	-
4-Chlorophenol	0.22	-	< 0.01	< 0.01	< 0.01	-
2,4-Dichlorophenol	0.12	-	< 0.003	< 0.003	< 0.003	-
2,4,6-Trichlorophenol	0.003	-	< 0.01	< 0.01	< 0.01	-
2,3,4,6-Tetrachlorophenol	0.010	-	< 0.03	< 0.03	< 0.03	-
Pentachorophenol	0.0036	0.011	< 0.01	< 0.01	< 0.01	-
2,4-Dinitrophenol	0.045	-	< 0.03	< 0.03	< 0.03	-
Total Recoverable Hydrocarbons						
TRH C10-36 (Total)	-	-	< 0.1	< 0.1	< 0.1	40.1
TRH C10-C14	-	-	< 0.05	< 0.05	< 0.05	2.5
TRH C15-C28	-	-	< 0.1	< 0.1	< 0.1	35
TRH C29-C36	-	-	< 0.1	< 0.1	< 0.1	2.6
TRH C6-C9	-	-	< 0.02	< 0.02	< 0.02	< 0.02
Naphthalene	0.016	0.05	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C10-C16	-	-	< 0.05	< 0.05	< 0.05	6.3
TRH >C10-C16 less Naphthalene (F2)	-	-	< 0.05	< 0.05	< 0.05	6.3
TRH >C10-C40 (total)*	-	-	< 0.1	< 0.1	< 0.1	44.2
TRH >C16-C34	-	-	< 0.1	< 0.1	< 0.1	37
TRH >C34-C40	-	-	< 0.1	< 0.1	< 0.1	0.9
TRH C6-C10	-	-	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)	-	-	< 0.02	< 0.02	< 0.02	< 0.02
Volatile Organic Compounds						
1.1.1.2-Tetrachloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	6.5	1.9	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	-	-	< 0.001	< 0.001	< 0.001	0.007
2-Propanone (Acetone)	-	-	< 0.001	0.068	< 0.001	0.025
4-Chlorotoluene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	-	-	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	-	-	0.001	< 0.001	0.004	< 0.001
cis-1.3-Dichloropropene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001

Table LAR2
Pyrmont Bridge Road (PBR) Site
Groundwater Results
8272-ER-1-3

		Sample ID	GW02	GW04	GW06	WATER PIT
		Reference	S19-Ma19580	S19-Ma19581	S19-Ma19582	S19-Fe10202
		Date Sampled	14/3/2019	14/3/2019	14/3/2019	8/02/2019
		Sample Matrix	Water	Water	Water	WATER
	ANZECC & ARMCANZ (2000)					
	Fresh Waters (mg/L)	Marine Waters (mg/L)				
Isopropyl benzene (Cumene)	-	-	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	-	-	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	-	-	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	-	-	< 0.001	0.001	< 0.001	< 0.001
Toluene	-	-	< 0.001	0.001	< 0.001	< 0.001
Total MAH*	-	-	< 0.003	< 0.003	< 0.003	< 0.003
trans-1.2-Dichloroethene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	-	-	< 0.001	0.001	0.006	< 0.001
Trichlorofluoromethane	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 CHC (Total)*	-	-	< 0.005	< 0.005	0.01	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	-	-	< 0.005	< 0.005	0.01	< 0.005
Vinyl chloride	-	-	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	-		< 0.003	< 0.003	< 0.003	< 0.003
Chlorinated Hydrocarbons						
1.2.3.4-Tetrachlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
1.2.3.5-Tetrachlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
1.2.3-Trichlorobenzene	**0.003**	-	< 0.001	< 0.001	< 0.001	-
1.2.4.5-Tetrachlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
1.2.4-Trichlorobenzene	**0.085**	**0.02**	< 0.001	< 0.001	< 0.001	-
1.2-Dichlorobenzene	**0.16**	-	< 0.001	< 0.001	< 0.001	-
1.3.5-Trichlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
1.3-Dichlorobenzene	**0.26**	-	< 0.001	< 0.001	< 0.001	-
1.4-Dichlorobenzene	**0.06**	-	< 0.001	< 0.001	< 0.001	-
Benzal chloride	-	-	< 0.0001	< 0.0001	< 0.0001	-
Benzotrichloride	-	-	< 0.0001	< 0.0001	< 0.0001	-
Benzyl chloride	-	-	< 0.001	< 0.001	< 0.001	-
Hexachlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
Hexachlorobutadiene	-	-	< 0.0001	< 0.0001	< 0.0001	-
Hexachlorocyclopentadiene	-	-	< 0.0001	< 0.0001	< 0.0001	-
Hexachloroethane	-	-	< 0.0001	< 0.0001	< 0.0001	-
Pentachlorobenzene	-	-	< 0.0001	< 0.0001	< 0.0001	-
TSS & TDS						
Total Dissolved Solids Dried at 180Â°C	-	-	430	380	300	-
Total Suspended Solids Dried at 103â€“105Â°C	-	-	30	6.4	25	-

(-) no available criteria or sample not analysed

TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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Table #	LAR3
Address	PBR Site, Annandale NSW
RPD Table	
Job Number	8272

			Sample ID	TP9.1.3	DUP1	Result	TP9.1.3	DUP1A
			Reference	S19-Ja10469	S19-Ja10476		S19-Ja10469	SE188273.001
			Date Sampled	16/1/2019	16/1/2019		16/1/2019	16/1/2019
			Sample Matrix	Soil	Soil		Soil	Soil
Group	**Analyte**	**Units**	**LOR**			RPD (%)		
Metals	**Arsenic**	**mg/kg**	**2**	13	16	21	13	6
	Cadmium	**mg/kg**	**0.4**	< 0.4	< 0.4	NA	< 0.4	<0.3
	Chromium	**mg/kg**	**5.0**	27	29	7	27	15
	Copper	**mg/kg**	**5.0**	6	8	29	6	5.1
	Lead	**mg/kg**	**5**	23	21	9	23	44
	Mercury	**mg/kg**	**0.1**	< 0.1	0.1	NA	< 0.1	0.10
	Nickel	**mg/kg**	**5**	< 5	< 5	NA	< 5	<0.5
	Zinc	**mg/kg**	**5**	10	7.5	29	10	9.6
TRH	**TRH C10-C36 Total**	**mg/kg**	**50**	< 50	<110	NA	< 50	< 50
	TRH C10-C14	**mg/kg**	**20**	< 20	<20	NA	< 20	< 20
	TRH C15-C28	**mg/kg**	**50**	< 50	<45	NA	< 50	< 50
	TRH C29-C36	**mg/kg**	**50**	< 50	<45	NA	< 50	< 50
	TRH C6-C9	**mg/kg**	**20**	< 20	<20	NA	< 20	< 20
	Naphthalene	**mg/kg**	**0.5**	< 0.5	<0.1	NA	< 0.5	< 0.5
	TRH >C10-C16 (F2)	**mg/kg**	**50**	< 50	<25	NA	< 50	< 50
	TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	< 50	<25	NA	< 50	< 50
	TRH C10-C40 Total (F bands)	**mg/kg**	**100**	< 100	<210	NA	< 100	< 100
	TRH >C16-C34 (F3)	**mg/kg**	**100**	< 100	<90	NA	< 100	< 100
	TRH >C34-C40 (F4)	**mg/kg**	**100**	< 100	<120	NA	< 100	< 100
	TRH C6-C10	**mg/kg**	**20**	< 20	<25	NA	< 20	< 20
	TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	< 20	<25	NA	< 20	< 20

	RPD exceeding criteria
NA	**Primary, Duplicate or Triplicate less than LOR and/or not analysed**

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TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

LAR3
PBR Site, Annandale NSW

8272

		Sample ID	Result	TP7.0.3	DUP2	Result	TP7.0.3	DUP2A	Result
		Reference		S19-Ja10460	S19-Ja10478		S19-Ja10460	SE188273.002	
		Date Sampled		16/1/2019	16/1/2019		16/1/2019	16/1/2019	
		Sample Matrix		Soil	Soil		Soil	Soil	
Analyte	**Units**	**LOR**	RPD (%)			RPD (%)			RPD (%)
Arsenic	**mg/kg**	**2**	74	7.4	8.1	9	7.4	5	39
Cadmium	**mg/kg**	**0.4**	NA	< 0.4	< 0.4	NA	< 0.4	<0.3	NA
Chromium	**mg/kg**	**5.0**	57	25	21	17	25	8.9	95
Copper	**mg/kg**	**5.0**	16	45	12	116	45	4.7	162
Lead	**mg/kg**	**5**	63	87	65	29	87	25	111
Mercury	**mg/kg**	**0.1**	NA	0.3	< 0.1	NA	0.3	0.49	48
Nickel	**mg/kg**	**5**	NA	< 5	< 5	NA	< 5	0.6	NA
Zinc	**mg/kg**	**5**	4	100	39	88	100	19	136
TRH C10-C36 Total	**mg/kg**	**50**	NA	114	< 50	NA	114	<110	NA
TRH C10-C14	**mg/kg**	**20**	NA	< 20	< 20	NA	< 20	<20	NA
TRH C15-C28	**mg/kg**	**50**	NA	64	< 50	NA	64	<45	NA
TRH C29-C36	**mg/kg**	**50**	NA	50	< 50	NA	50	<45	NA
TRH C6-C9	**mg/kg**	**20**	NA	< 20	< 20	NA	< 20	<20	NA
Naphthalene	**mg/kg**	**0.5**	NA	< 0.5	< 0.5	NA	< 0.5	<0.1	NA
TRH >C10-C16 (F2)	**mg/kg**	**50**	NA	< 50	< 50	NA	< 50	<25	NA
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	NA	< 50	< 50	NA	< 50	<25	NA
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	NA	110	< 100	NA	110	<210	NA
TRH >C16-C34 (F3)	**mg/kg**	**100**	NA	110	< 100	NA	110	<90	NA
TRH >C34-C40 (F4)	**mg/kg**	**100**	NA	< 100	< 100	NA	< 100	<120	NA
TRH C6-C10	**mg/kg**	**20**	NA	< 20	< 20	NA	< 20	<25	NA
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	NA	< 20	< 20	NA	< 20	<25	NA

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

LAR3
PBR Site, Annandale NSW

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		Sample ID	TP05-0.1-0.3	DUP-03	Result	TP05-0.1-0.3	DUP-03A	Result	TP02-0.0-0.2
		Reference	S19-Ja12032	S19-Ja12038		S19-Ja12032	S19-Ja12039		S19-Ja26566
		Date Sampled	17/1/2019	17/1/2019		17/1/2019	17/1/2019		30/01/2019
		Sample Matrix	Soil	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**			RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	6.9	6.3	9	6.9	13	61	3
Cadmium	**mg/kg**	**0.4**	< 0.4	< 0.4	NA	< 0.4	< 0.4	NA	< 0.4
Chromium	**mg/kg**	**5.0**	20	14	35	20	18	11	53
Copper	**mg/kg**	**5.0**	17	39	79	17	53	103	24
Lead	**mg/kg**	**5**	120	230	63	120	280	80	27
Mercury	**mg/kg**	**0.1**	0.2	0.3	40	0.2	0.2	0	< 0.1
Nickel	**mg/kg**	**5**	< 5	6.2	NA	< 5	7.5	NA	54
Zinc	**mg/kg**	**5**	110	200	58	110	430	119	79
TRH C10-C36 Total	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	-	NA	-	-	NA	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

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TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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PBR Site, Annandale NSW

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		Sample ID	DUP-04		TP02-0.0-0.2	DUP-4A	Result	BH05-0.0-0.2	DUP-05
		Reference	S19-Ja26577		S19-Ja26566	S19-Ja26578		S19-Fe02484	S19-Ja28097
		Date Sampled	30/01/2019		30/01/2019	30/01/2019		31/1/2019	31/1/2019
		Sample Matrix	Soil		Soil	Soil		Soil	Soil
Analyte	**Units**	**LOR**		RPD (%)			RPD (%)		
Arsenic	**mg/kg**	**2**	3.8	24	3	3.2	6	7.5	8.3
Cadmium	**mg/kg**	**0.4**	< 0.4	NA	< 0.4	< 0.4	NA	< 0.4	< 0.4
Chromium	**mg/kg**	**5.0**	67	23	53	71	29	14	16
Copper	**mg/kg**	**5.0**	25	4	24	27	12	200	87
Lead	**mg/kg**	**5**	35	26	27	33	20	380	270
Mercury	**mg/kg**	**0.1**	< 0.1	NA	< 0.1	< 0.1	NA	0.4	0.3
Nickel	**mg/kg**	**5**	52	4	54	71	27	6.7	6.3
Zinc	**mg/kg**	**5**	95	18	79	97	20	340	180
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

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LAR3
PBR Site, Annandale NSW

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		Sample ID	Result	BH05-0.0-0.2	DUP-5A	Result	BH15-0.2-0.4	DUP-06	Result
		Reference		S19-Fe02484	SE188741.001		S19-Ja28083	S19-Ja28098	
		Date Sampled		31/1/2019	31/1/2019		31/1/2019	31/1/2019	
		Sample Matrix		Soil	Soil		Soil	Soil	
Analyte	**Units**	**LOR**	RPD (%)			RPD (%)			RPD (%)
Arsenic	**mg/kg**	**2**	10	7.5	6	22	< 2	< 2	NA
Cadmium	**mg/kg**	**0.4**	NA	< 0.4	0.3	NA	< 0.4	< 0.4	NA
Chromium	**mg/kg**	**5.0**	13	14	6.3	76	< 5	< 5	NA
Copper	**mg/kg**	**5.0**	79	200	130	42	< 5	< 5	NA
Lead	**mg/kg**	**5**	34	380	310	20	6.1	< 5	NA
Mercury	**mg/kg**	**0.1**	29	0.4	0.42	5	< 0.1	< 0.1	NA
Nickel	**mg/kg**	**5**	6	6.7	4.4	41	< 5	< 5	NA
Zinc	**mg/kg**	**5**	62	340	420	21	< 5	< 5	NA
TRH C10-C36 Total	**mg/kg**	**50**	NA	-	-	NA	-	-	NA
TRH C10-C14	**mg/kg**	**20**	NA	-	-	NA	-	-	NA
TRH C15-C28	**mg/kg**	**50**	NA	-	-	NA	-	-	NA
TRH C29-C36	**mg/kg**	**50**	NA	-	-	NA	-	-	NA
TRH C6-C9	**mg/kg**	**20**	NA	-	-	NA	-	-	NA
Naphthalene	**mg/kg**	**0.5**	NA	-	-	NA	-	-	NA
TRH >C10-C16 (F2)	**mg/kg**	**50**	NA	-	-	NA	-	-	NA
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	NA	-	-	NA	-	-	NA
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	NA	-	-	NA	-	-	NA
TRH >C16-C34 (F3)	**mg/kg**	**100**	NA	-	-	NA	-	-	NA
TRH >C34-C40 (F4)	**mg/kg**	**100**	NA	-	-	NA	-	-	NA
TRH C6-C10	**mg/kg**	**20**	NA	-	-	NA	-	-	NA
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	NA	-	-	NA	-	-	NA

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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PBR Site, Annandale NSW

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		Sample ID	BH15-0.2-0.4	DUP-6A	Result	BH20-0.0-0.2	DUP-07	Result	BH20-0.0-0.2
		Reference	S19-Ja28083	SE188741.002		S19-Ja28085	S19-Ja28099		S19-Ja28085
		Date Sampled	31/1/2019	31/1/2019		31/1/2019	31/1/2019		31/1/2019
		Sample Matrix	Soil	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**			RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	< 2	2	NA	4	6.9	53	4
Cadmium	**mg/kg**	**0.4**	< 0.4	<0.3	NA	< 0.4	0.6	NA	< 0.4
Chromium	**mg/kg**	**5.0**	< 5	0.8	NA	12	13	8	12
Copper	**mg/kg**	**5.0**	< 5	1.1	NA	280	510	58	280
Lead	**mg/kg**	**5**	6.1	18	99	270	300	11	270
Mercury	**mg/kg**	**0.1**	< 0.1	<0.05	NA	0.4	0.4	0	0.4
Nickel	**mg/kg**	**5**	< 5	2.3	NA	5.5	7	24	5.5
Zinc	**mg/kg**	**5**	< 5	5	NA	520	670	25	520
TRH C10-C36 Total	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	-	NA	-	-	NA	-

RPD exceeding criteria

Primary, Duplicate or Triplicate less than LOR and/or not analysed

TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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PBR Site, Annandale NSW

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		Sample ID	DUP-7A	Result	BH21B-0.05-0.2	DUP-12	Result	BH21B-0.05-0.2
		Reference	SE188741.003		S19-Ma01947	S19-Ma01934		S19-Ma01947
		Date Sampled	31/1/2019		28/02/2019	28/02/2019		28/02/2019
		Sample Matrix	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**		RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	5	22	9.3	10	7	9.3
Cadmium	**mg/kg**	**0.4**	0.4	NA	1.6	1.5	6	1.6
Chromium	**mg/kg**	**5.0**	8.6	33	24	26	8	24
Copper	**mg/kg**	**5.0**	290	4	160	140	13	160
Lead	**mg/kg**	**5**	370	31	900	1200	29	900
Mercury	**mg/kg**	**0.1**	0.26	42	1.6	1.4	13	1.6
Nickel	**mg/kg**	**5**	4.7	16	25	24	4	25
Zinc	**mg/kg**	**5**	480	8	1000	1000	0	1000
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

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TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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PBR Site, Annandale NSW

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		Sample ID	DUP-12A	Result	BH13 0.0-0.2	DUP-13	Result	BH13 0.0-0.2
		Reference	SE189893.001		S19-Ma01938	S19-Ma01935		S19-Ma01938
		Date Sampled	28/02/2019		28/02/2019	28/02/2019		28/02/2019
		Sample Matrix	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**		RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	11	17	5.6	4.3	26	5.6
Cadmium	**mg/kg**	**0.4**	1.3	21	< 0.4	< 0.4	NA	< 0.4
Chromium	**mg/kg**	**5.0**	15	46	18	13	32	18
Copper	**mg/kg**	**5.0**	130	21	23	33	36	23
Lead	**mg/kg**	**5**	860	5	160	300	61	160
Mercury	**mg/kg**	**0.1**	0.69	79	0.5	0.4	22	0.5
Nickel	**mg/kg**	**5**	21	17	10	6.5	42	10
Zinc	**mg/kg**	**5**	770	26	120	120	0	120
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

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PBR Site, Annandale NSW

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		Sample ID	DUP-13A	Result	BH19-0.0-0.2	DUP-14	Result	BH19-0.0-0.2
		Reference	SE189893.002		S19-Ma01952	S19-Ma01936		S19-Ma01952
		Date Sampled	28/02/2019		28/02/2019	28/02/2019		28/02/2019
		Sample Matrix	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**		RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	6	7	20	6.2	105	20
Cadmium	**mg/kg**	**0.4**	<0.3	NA	< 0.4	< 0.4	NA	< 0.4
Chromium	**mg/kg**	**5.0**	8.4	73	88	16	138	88
Copper	**mg/kg**	**5.0**	29	23	7.8	75	162	7.8
Lead	**mg/kg**	**5**	230	36	58	1200	182	58
Mercury	**mg/kg**	**0.1**	0.47	6	0.1	1	164	0.1
Nickel	**mg/kg**	**5**	4.4	78	< 5	7.6	NA	< 5
Zinc	**mg/kg**	**5**	120	0	15	280	180	15
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

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TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

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PBR Site, Annandale NSW

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		Sample ID	DUP-14A	Result	BH02-0.2-0.4	DUP-15	Result	BH02-0.2-0.4
		Reference	SE189893.003		S19-Ma03542	S19-Ma03550		S19-Ma03542
		Date Sampled	28/02/2019		1/3/2019	1/3/2019		1/3/2019
		Sample Matrix	Soil		Soil	Soil		Soil
Analyte	**Units**	**LOR**		RPD (%)			RPD (%)	
Arsenic	**mg/kg**	**2**	4	133	9.4	11	16	9.4
Cadmium	**mg/kg**	**0.4**	<0.3	NA	< 0.4	< 0.4	NA	< 0.4
Chromium	**mg/kg**	**5.0**	10	159	32	37	14	32
Copper	**mg/kg**	**5.0**	9.2	16	96	18	137	96
Lead	**mg/kg**	**5**	170	98	240	94	87	240
Mercury	**mg/kg**	**0.1**	0.32	105	0.3	< 0.1	NA	0.3
Nickel	**mg/kg**	**5**	1.5	NA	18	24	29	18
Zinc	**mg/kg**	**5**	41	93	440	110	120	440
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

TABLE LAR3
RPD Results

8272-ER-1-3
PBR Site, Annandale NSW

LAR3
PBR Site, Annandale NSW

8272

		Sample ID	DUP-15A	Result	GW06	DUP-01	Result	GW06	DUP-01A
		Reference	SE189892.001		S19-Ma19582	S19-Ma19583		S19-Ma19582	SE190641.001
		Date Sampled	1/3/2019		14/3/2019	14/3/2019		14/3/2019	14/3/2019
		Sample Matrix	Soil		Water	Water		Water	Water
Analyte	**Units**	**LOR**		RPD (%)					
Arsenic	**mg/kg**	**2**	5	61	< 0.001	< 0.001	NA	< 0.001	<0.001
Cadmium	**mg/kg**	**0.4**	<0.3	NA	0.05	0.051	2	0.05	0.061
Chromium	**mg/kg**	**5.0**	29	10	0.096	0.094	2	0.096	0.12
Copper	**mg/kg**	**5.0**	22	125	0.022	0.022	0	0.022	0.025
Lead	**mg/kg**	**5**	680	96	< 0.001	< 0.001	NA	< 0.001	<0.001
Mercury	**mg/kg**	**0.1**	0.24	22	< 0.0001	< 0.0001	NA	< 0.0001	<0.001
Nickel	**mg/kg**	**5**	8.0	77	0.058	0.059	2	0.058	0.064
Zinc	**mg/kg**	**5**	320	32	0.025	0.018	33	0.025	0.036
TRH C10-C36 Total	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C10-C14	**mg/kg**	**20**	-	NA	-	-	NA	-	-
TRH C15-C28	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C29-C36	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C6-C9	**mg/kg**	**20**	-	NA	-	-	NA	-	-
Naphthalene	**mg/kg**	**0.5**	-	NA	-	-	NA	-	-
TRH >C10-C16 (F2)	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH >C10-C16 (F2) - Naphthalene	**mg/kg**	**50**	-	NA	-	-	NA	-	-
TRH C10-C40 Total (F bands)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH >C16-C34 (F3)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH >C34-C40 (F4)	**mg/kg**	**100**	-	NA	-	-	NA	-	-
TRH C6-C10	**mg/kg**	**20**	-	NA	-	-	NA	-	-
TRH C6-C10 minus BTEX (F1)	**mg/kg**	**20**	-	NA	-	-	NA	-	-

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

Alliance Geotechnical
ENGINEERING | ENVIRONMENTAL | TESTING
Your On-Site Geotechnical & Environmental Specialists

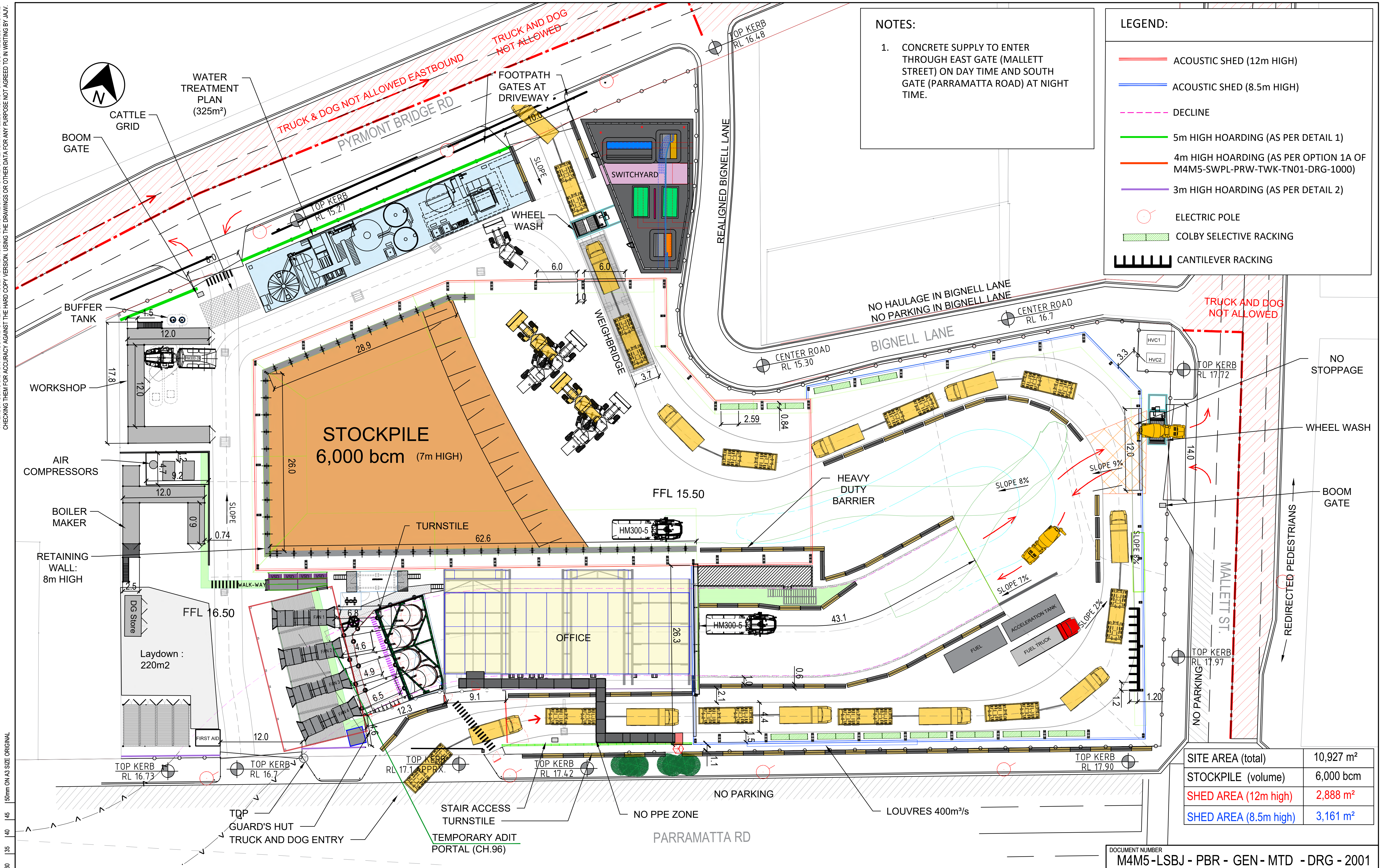
LAR3
PBR Site, Annandale NSW

8272

		Sample ID	Result
		Reference	
		Date Sampled	
		Sample Matrix	
Analyte	**Units**	**LOR**	
Arsenic	mg/kg	2	NA
Cadmium	mg/kg	0.4	20
Chromium	mg/kg	5.0	22
Copper	mg/kg	5.0	13
Lead	mg/kg	5	NA
Mercury	mg/kg	0.1	NA
Nickel	mg/kg	5	10
Zinc	mg/kg	5	36
TRH C10-C36 Total	mg/kg	50	NA
TRH C10-C14	mg/kg	20	NA
TRH C15-C28	mg/kg	50	NA
TRH C29-C36	mg/kg	50	NA
TRH C6-C9	mg/kg	20	NA
Naphthalene	mg/kg	0.5	NA
TRH >C10-C16 (F2)	mg/kg	50	NA
TRH >C10-C16 (F2) - Naphthalene	mg/kg	50	NA
TRH C10-C40 Total (F bands)	mg/kg	100	NA
TRH >C16-C34 (F3)	mg/kg	100	NA
TRH >C34-C40 (F4)	mg/kg	100	NA
TRH C6-C10	mg/kg	20	NA
TRH C6-C10 minus BTEX (F1)	mg/kg	20	NA

RPD exceeding criteria
Primary, Duplicate or Triplicate less than LOR and/or not analysed

Appendix B. Figures and Tables from ASBJV Site Work



NOTES:

1. CONCRETE SUPPLY TO ENTER THROUGH EAST GATE (MALLETT STREET) ON DAY TIME AND SOUTH GATE (PARRAMATTA ROAD) AT NIGHT TIME.

LEGEND:

- ACOUSTIC SHED (12m HIGH)
- ACOUSTIC SHED (8.5m HIGH)
- DECLINE
- 5m HIGH HOARDING (AS PER DETAIL 1)
- 4m HIGH HOARDING (AS PER OPTION 1A OF M4M5-SWPL-PRW-TWK-TN01-DRG-1000)
- 3m HIGH HOARDING (AS PER DETAIL 2)
- ELECTRIC POLE
- COLBY SELECTIVE RACKING
- CANTILEVER RACKING

SITE AREA (total)	10,927 m²
STOCKPILE (volume)	6,000 bcm
SHED AREA (12m high)	2,888 m²
SHED AREA (8.5m high)	3,161 m²

DOCUMENT NUMBER: M4M5-LSBJ-PBR-GEN-MTD-DRG-2001

M4-M5 LINK MAIN TUNNEL WORKS

A3

CONSTRUCTION SITE ESTABLISHMENT
PYRMONT BRIDGE ROAD
GENERAL ARRANGEMENT

DRAWING FILE LOCATION \ NAME: \\ausyd250nf7001p.lljvs.com\data$\WCX3a\Methods\2.PBR\M4M5-LSBJ-PBR-GEN-MTD-DRG-2001-A32 GENERAL ARRANGEMENT.dwg
PLOT DATE \ TIME: 13/02/2020 5:28:32 PM
PLOT BY: jusc392

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING

REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
A27	31-10-2019	REVISED AS PER UPDATED REFERENCES	
A28	25-11-2019	REVISED AS PER INSTRUCTION	
A29	03-12-2019	REVISED AS PER UPDATED WORKSHOP ARRANGEMENT	
A30	09-12-2019	REVISED AS PER UPDATED VSD LAYOUT AND ADDED PALLET RACKING	
A31	20-01-2020	REVISED AS PER UPDATED REFERENCE	
A32	13-02-2020	REVISED AS PER INSTRUCTIONS	

DESIGN LOT CODE: M4M5-LSBJ-PBR-GEN-MTD-DRG-2001

SCALES ON A3 SIZE DRAWING: 1:500 FULL SIZE A3

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

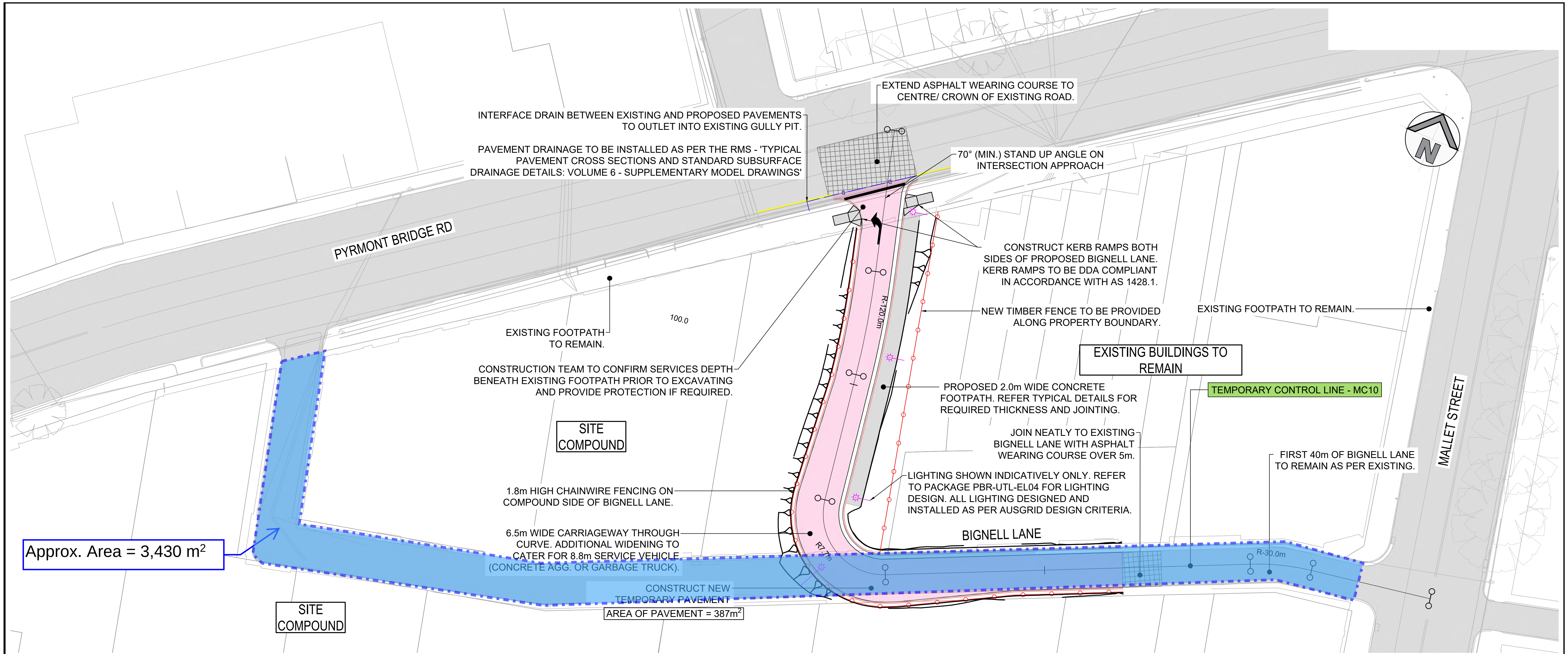
DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels — Lendlease, Samsung C&T, Bouygues Australia

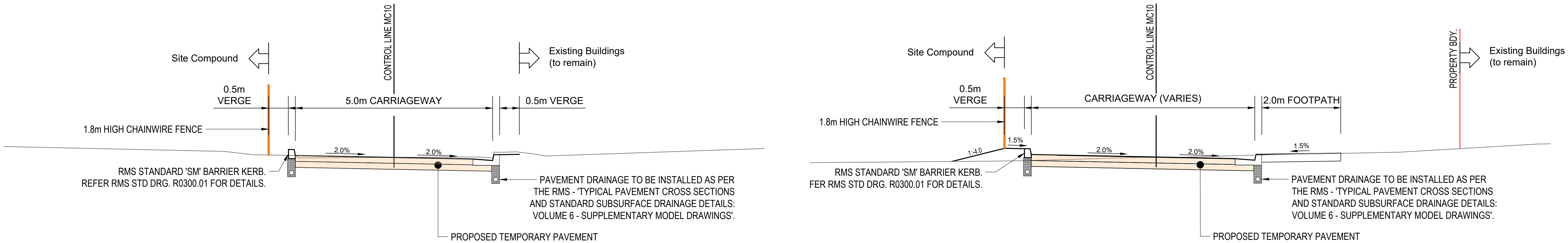
TITLE	NAME	DATE
DRAWN	C.LEMON	18-10-2018
DRG CHECK	S.ORDONNEAU	18-10-2018
DESIGN	-	-
PKG OWNER	-	-
DESIGN CHECK	-	-
DESIGN MNGR	-	-
PROJECT MNGR	-	-

CLIENT: Sydney Motorway Corporation, WestConnex

RMS REGISTRATION No.

ISSUE STATUS	EDMS No.	SHEET No.	REV
-	-	1 of 1	A32





TYPICAL SECTION
BIGNELL LANE

TYPICAL SECTION
BIGNELL LANE (CH. 90)

DIAL 1100 BEFORE YOU DIG

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALING 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

NOTES:

1. REFER DRAWING TT02-DRG-1001 FOR LEGEND AND GENERAL NOTES.

ORIGINAL DRAWING IN COLOUR

ACCEPTED FOR CONSTRUCTION

No.	Revision Description	Initials	Approved	Date
00	ACCEPTED FOR CONSTRUCTION	C.C.	A. GOSPER	18.04.19

Prepared by D & C CIVIL

Client WestConnex M4-M5 Link Tunnels · lendlease · SAMSUNG C&T · BOUYGUES AUSTRALIA

0 5 10 15 20m

Dimensions in metres unless otherwise noted

Drawn C.C. · Designer C.C.
Check D.H. · Check D.H.
Approved
Date 18/04/2019
Scale 1:500 (A1) · DO NOT SCALE

Client LSBJV (LENDLEASE SAMSUNG BOUYGUES JOINT VENTURE)
Project WESTCONNEX M4-M5 LINK TUNNELS
Title BIGNELL LANE REALIGNMENT DETAIL PLAN (1 OF 1)
Sheet A1 · Drawing No: M4M5-DCCI-PBR-TWK-TT02-DRG-1101 · Rev:00

Plotted By: chris Plot Date: 18/04/19 - 12:47 Cad File: X:\LL18020 - WCX\info in\20190411 - bignell IFC etransmit\DG-1000.dwg

PBR Site Boundary Map

8/3/2021, 2:35:31 PM

Ancilliary Facilities

1:1,128

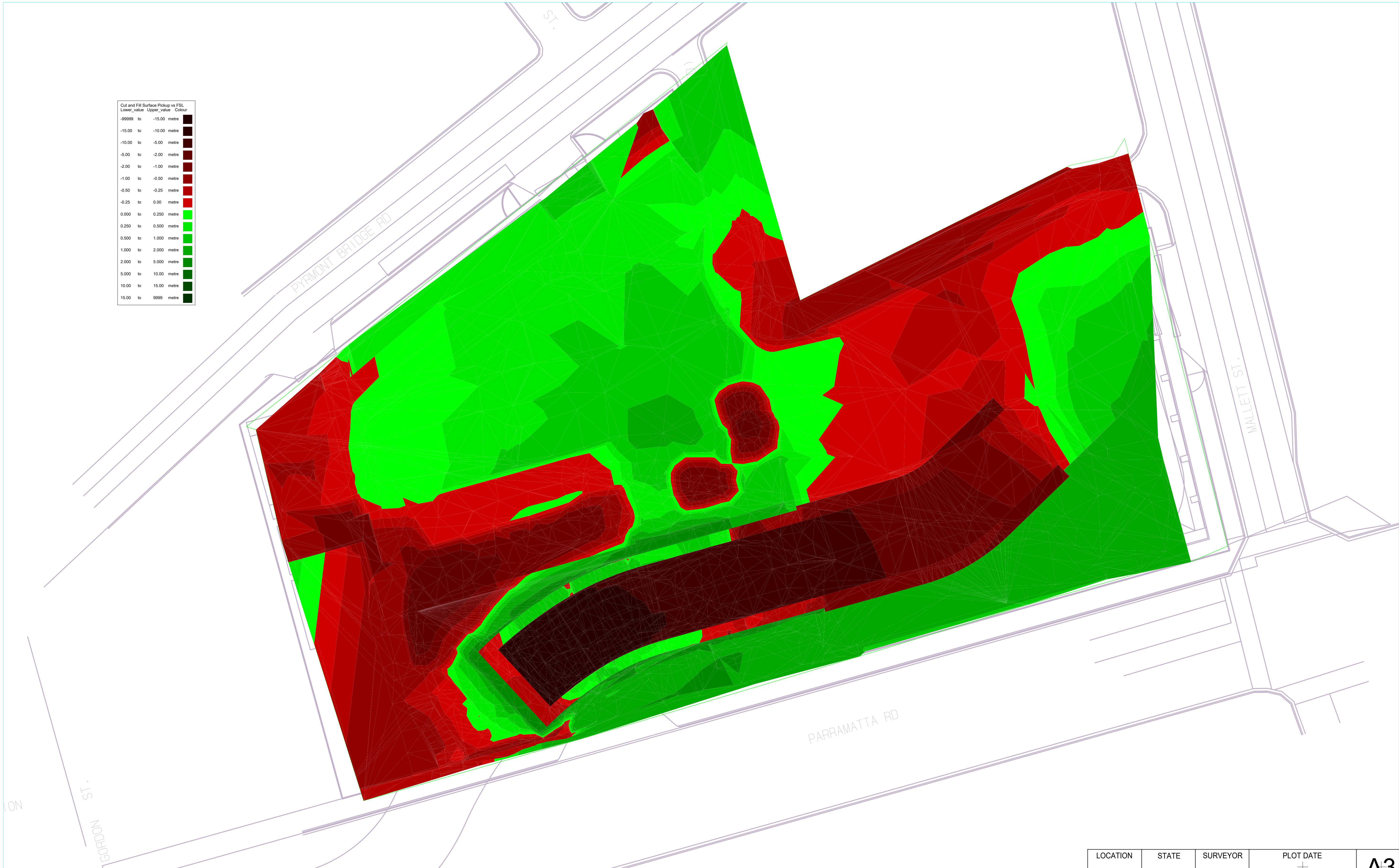
0 0.01 0.02 0.04 mi

0 0.02 0.04 0.07 km

Esri Community Maps Contributors, Spatial Services, Esri, HERE, Garmin, METI/NASA, USGS, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, ASBJV, ASBJV GIS

WestConnex M4-M5 Link Tunnels
Acciona Samsung Bouygues Joint Venture

Plot File: C:\PBR\Outgoing\To Matt\CAF UPTO 0213\CAF 190213 PICKUP VS 250 LOWER DESIGN FSL1



LOCATION	STATE	SURVEYOR	PLOT DATE	A3
PBR	NSW	BL	Wed Feb 13 17:26:50 2019	

REV	ZONE	AMENDMENTS	APP'D	DATE

GENERAL NOTES / REFERENCES

Suite 1/Level 5
8 Australia Avenue
Sydney Olympic Park NSW

1300 764 160

SURVEYED / DRAWN BY

COORDINATE SYSTEM: MGA Zone 56

HEIGHT DATUM: A.H.D

SCALE 1:600

CUT AND FILL 190213 PICKUP VS 250 LOWER FSL

SHEET 1 of

REVISION A

Project:

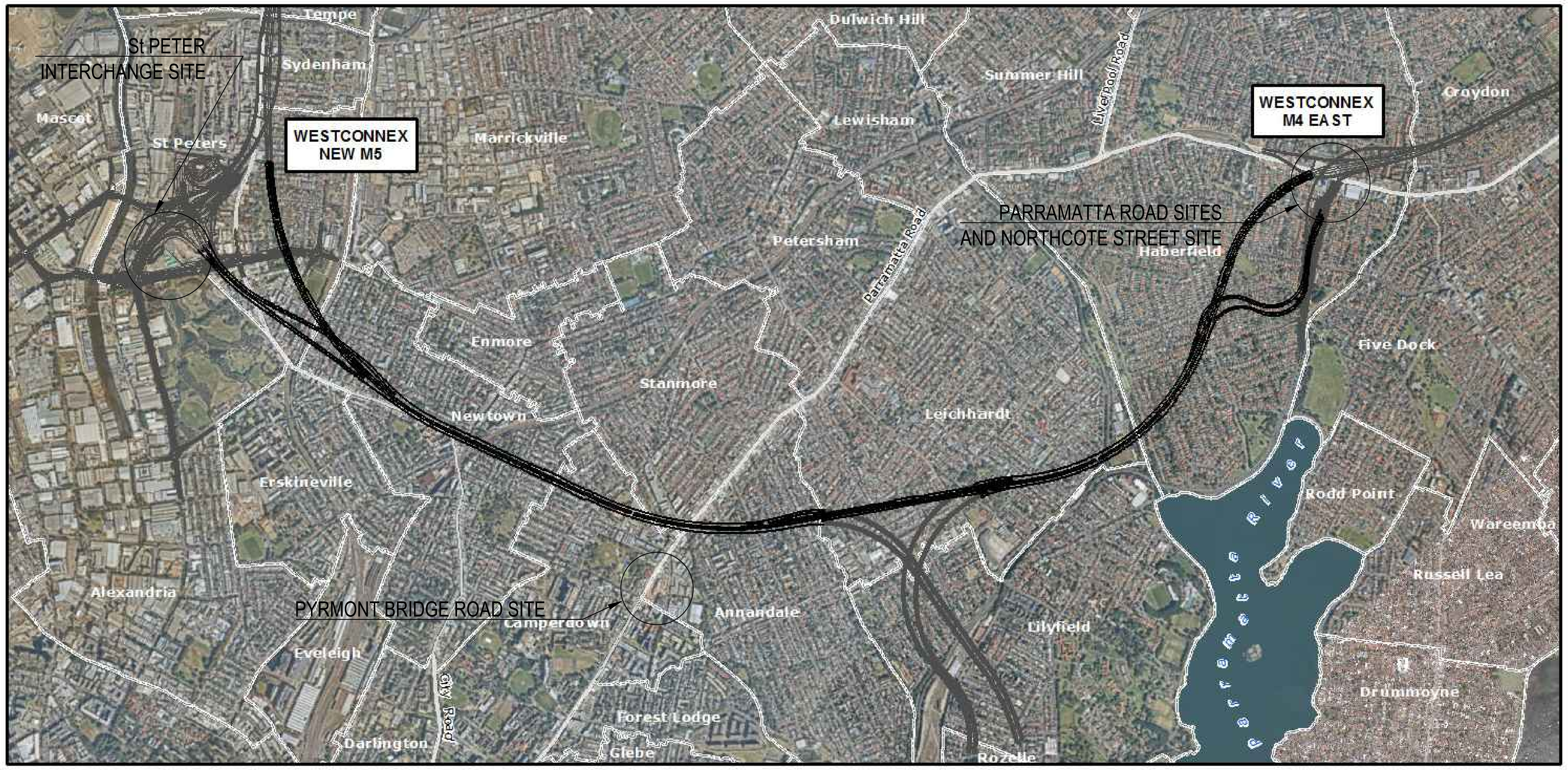
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

M4M5 LINK MAIN TUNNEL WORKS

PROJECT WIDE

PACKAGE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

CONSTRUCTION SITE REINSTATEMENT



LOCALITY PLAN
NTS

ACCEPTED FOR CONSTRUCTION

DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY				
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE
M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona
SAMSUNG C&T
BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5 - RBGP - PRW - CIV - CW02 - DRG - 1000

M4-M5 LINK MAIN TUNNEL WORKS — A3
PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT

COVER SHEET

RMS REGISTRATION No.
PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
ISSUED FOR CONSTRUCTION	-	CW02-DRG-1000	00

NOTES:
1. ALL PORTABLE STRUCTURES AND ELECTRICAL EQUIPMENTS ARE TO REMOVED AS PART OF THE FINAL REINSTATEMENT PACKAGE.
2. ALL STOCKPILE TO BE REMOVED FROM SITE WEIGHBRIDGE AND WEIGH WASH TO BE REMOVED AND BACKFILLED AS PER PAVEMENT DETAIL SHOWN IN M4M5-RBGP-PRW-CIV-CW02-DRG-3041
4. ALL STORMWATER NETWROK TO BE RETAINED UNLESS NOTED OTHERWISE
5. REFER TO M4M5-RBGP-PRW-CIV-CW02-DRG-2032 FOR FENCE AND GATE DETAILS
6. ALL THE ABANDONED PITS / TANKS (NOT HAVE BEEN USED FOR FLAMMABLE/COMBUSTIBLE CHEMICALS) TO BE FILLED WITH SAND AND SEALED.
7. FILTER BASKET TO BE INSTALLED IN ALL PROPOSED NEW STORMWATER PITS
8. CLASS D GRATE TO BE PROVIDED OR TO BE INSTALLED FOR ALL PROPOSED STORMWATER PITS
9. ANY EXISTING DRAINS, PITS, DRAINAGE LINES PROPOSED TO BE LEFT IN PLACE ARE REQUIRED TO BE FLUSHED AND CLEARED OF BLOCKAGES AND EVIDENCED AS FIT FOR PURPOSE WITH MEASURES SUCH AS CCTV PRIOR TO HANDOVER

LEGEND

	TO BE REMOVED
	EXISTING
00.00	MAJOR CONTOUR
	MINOR CONTOUR
00.00	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	ADD PROPOSED 1.8m CHAIN LINK FENCE WITH RMS BRANDING
	EXISTING CHAIN LINK SECURITY FENCE
	PROPOSED SECURITY GATE
	PROPOSED PAVEMENT REFER TO PAVEMENT PLAN
	EXISTING TEMPORARY PAVEMENT TO BE REPAVED
	PROPOSED STORMWATER PIT
	EXISTING STORMWATER PIT
	PROPOSED DIVERSION DRAIN
S	SEWER
W	WATER

ACCEPTED FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

A PERSON USING LLEN DRAWINGS AND OTHER DATA ACCEPTS THE RISK OF: USING THE DRAWING AND OTHER DATA IN ELECTRONIC FORM WITHOUT REQUESTING AND CHECKING THEM FOR ACCURACY AGAINST THE HARD COPY VERSION. USING THE DRAWINGS OR OTHER DATA FOR ANY PURPOSE NOT AGREED TO IN WRITING BY LLEN.

DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels, acciona, SAMSUNG C&T, BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW- CIV -CW02-DRG- 3001

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
GENERAL ARRANGMENT PLAN

SHEET 1 OF 1

RMS REGISTRATION No.

PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION
EDMS No.: -
SHEET No.: CW02-DRG-3001
REV: 00

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DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY				
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-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels — acciona — SAMSUNG C&T — BOUYGUES CONSTRUCTION AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3002

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
ROAD GENERAL ARRANGEMENT

SHEET 1 OF 1

RMS REGISTRATION No. — PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION — EDMS No.: - — SHEET No.: CW02-DRG-3002 — REV: 00

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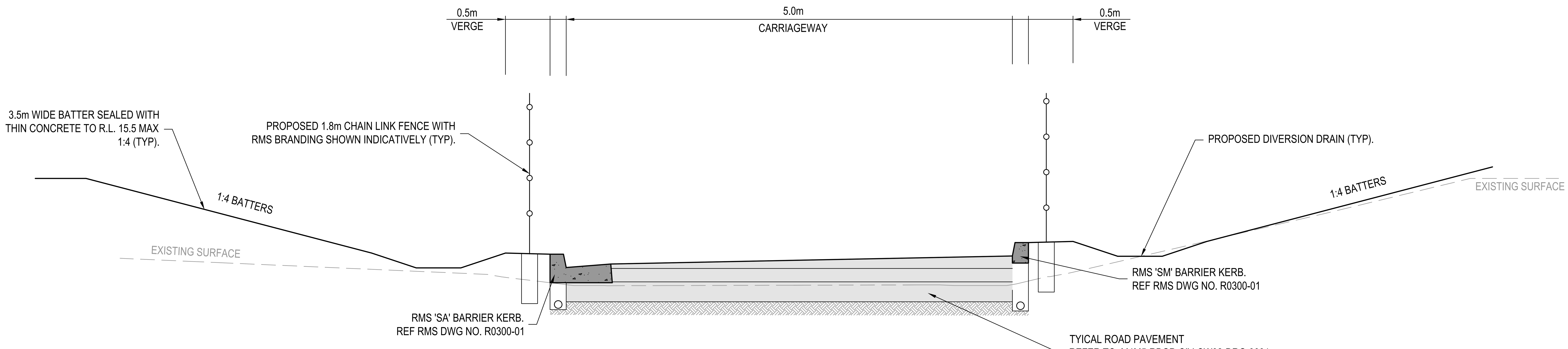

TYPICAL ROAD SECTION
BIGNELL LANE
NOT TO SCALE

ASBJV DM Remarks:
2022 06 27
Typo corrected from
CW01 to CW02
from FD to IFC

ACCEPTED FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY
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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE
-				
-				
-				
-				
-				
-				
-				

DESIGN PACKAGE CODE
M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona SAMSUNG SAMSUNG C&T BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

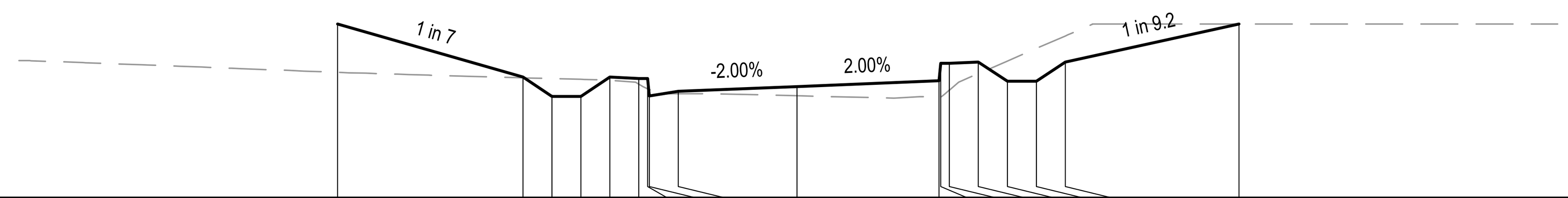
Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW- CIV -CW02-DRG- 3010

M4-M5 LINK MAIN TUNNEL WORKS — A3
PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGEROAD SITE
TYPICAL SECTIONS — SHEET 1 OF 1

RMS REGISTRATION No. — PART 1

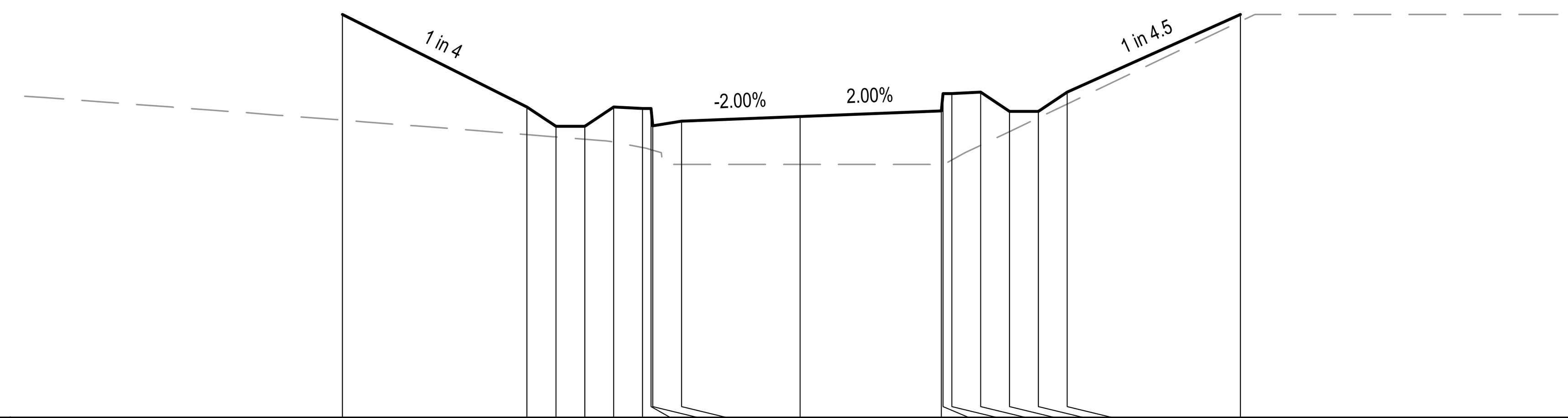
ISSUE STATUS: ISSUED FOR CONSTRUCTION
EDMS No.: -
SHEET No.: CW02-DRG-3010
REV: 00



DATUM R.L. 14.00

DESIGN HEIGHT	15.500	15.044	14.877	14.877	15.044	15.031	15.031	14.881	14.921	14.962	15.011	15.161	15.161	15.174	15.007	15.007	15.174	15.500
EXISTING SURFACE	15.084	15.037	15.030	15.024	15.015	14.983	14.941	14.937	14.900	14.882	14.874	14.874	14.931	15.073	15.181	15.289	15.397	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

CHAINAGE 40.000



DATUM R.L. 12.00

DESIGN HEIGHT	15.500	14.696	14.530	14.530	14.696	14.684	14.684	14.534	14.574	14.615	14.664	14.814	14.814	14.826	14.660	14.660	14.826	15.500
EXISTING SURFACE	14.583	14.457	14.438	14.417	14.393	14.345	14.326	14.322	14.200	14.200	14.200	14.200	14.237	14.365	14.484	14.603	14.723	15.439
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

CHAINAGE 70.000

CONTROL LINE XXXX
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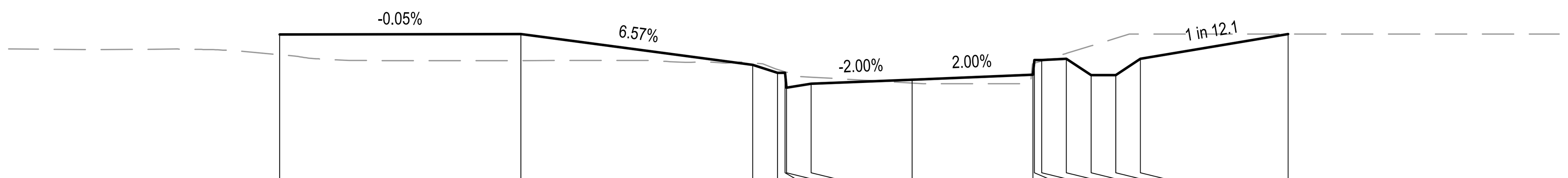
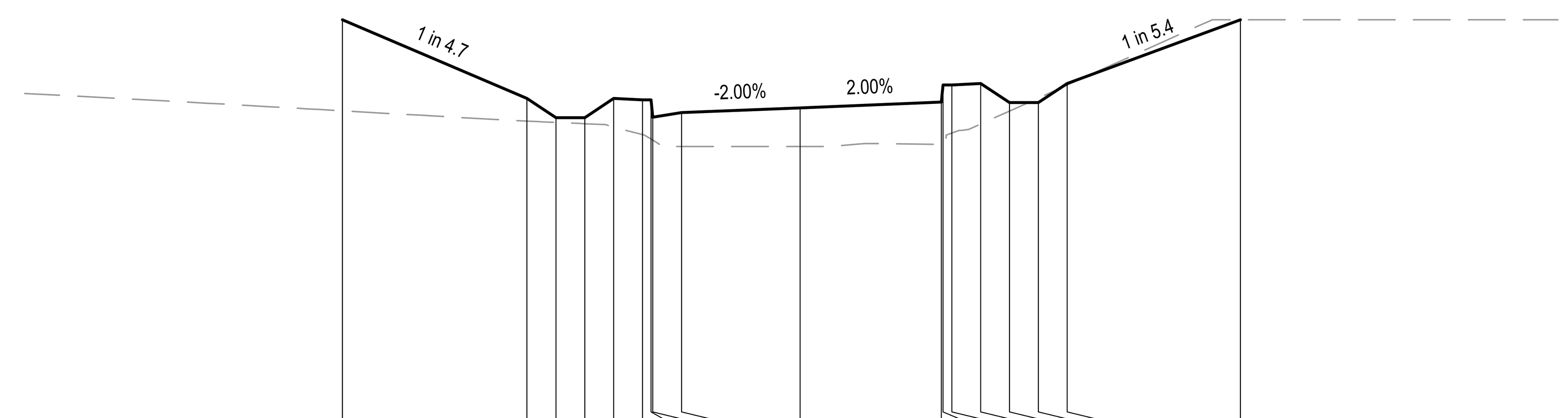
Y = 6248919.194
Z = 15.040



DATUM R.L. 14.00

DESIGN HEIGHT	15.497	15.500	15.191	15.109	15.109	14.959	14.999	15.040	15.089	15.239	15.239	15.252	15.085	15.085	15.252	15.501
EXISTING SURFACE	15.292	15.233	15.209	15.144	15.121	15.116	15.066	15.007	15.201	15.206	15.229	15.305	15.382	15.458	15.500	15.500
OFFSETS	-12.833	-7.939	-3.233	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

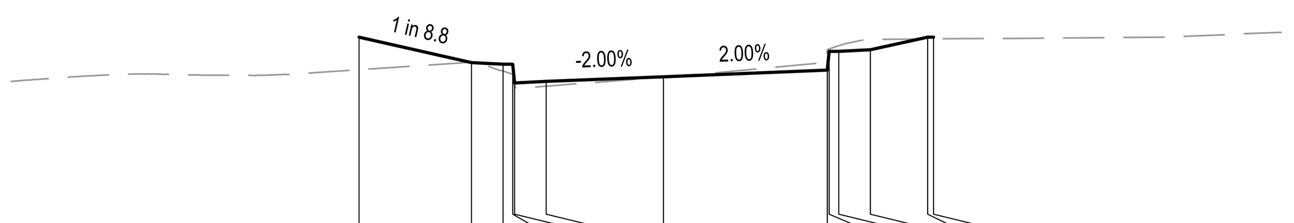
CHAINAGE 33.000



DATUM R.L. 12.00

DESIGN HEIGHT	15.500	14.818	14.651	14.651	14.818	14.805	14.805	14.655	14.695	14.736	14.785	14.935	14.935	14.948	14.781	14.781	14.948	15.500
EXISTING SURFACE	14.710	14.621	14.610	14.598	14.567	14.504	14.465	14.457	14.400	14.400	14.420	14.419	14.517	14.596	14.708	14.821	14.934	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

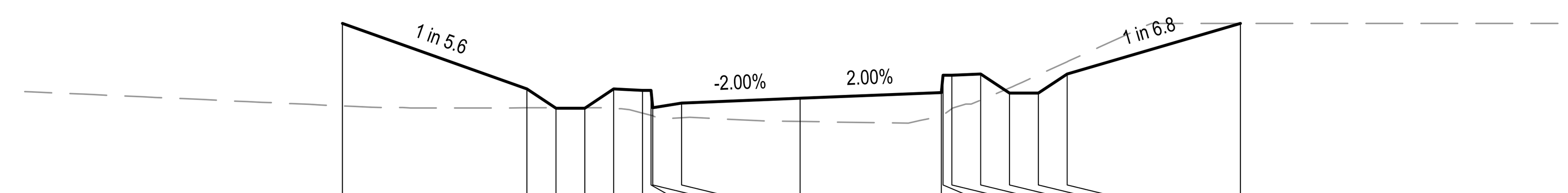
CHAINAGE 60.000



DATUM R.L. 14.00

DESIGN HEIGHT	15.500	15.299	15.286	15.286	15.136	15.149	15.186	15.238	15.388	15.388	15.400	15.500	15.500
EXISTING SURFACE	15.241	15.300	15.231	15.204	15.149	15.112	15.183	15.400	15.405	15.431	15.481	15.484	15.485
OFFSETS	-4.813	-3.035	-2.535	-2.385	-2.355	-1.855	0.000	2.591	2.621	2.771	3.271	4.180	4.271

CHAINAGE 20.000



DATUM R.L. 14.00

DESIGN HEIGHT	15.500	14.932	14.765	14.765	14.932	14.919	14.919	14.769	14.809	14.850	14.899	15.049	15.049	15.062	14.895	14.895	15.062	15.500
EXISTING SURFACE	14.785	14.768	14.768	14.769	14.764	14.723	14.703	14.699	14.682	14.650	14.699	14.706	14.760	14.835	14.940	15.053	15.167	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

CHAINAGE 50.000

SCALE
A1 (H) 1:100 (V) 1:50
A3 (H) 1:200 (V) 1:100

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DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY
C:\Users\chris.waite\Documents\WCX\Drawings\PYRMONT BRIDGE\M4M5-RBGP-PRW-CIV-CW02-DRG-3010.dwg-27/06/2022 7:06:37 AM-Chris.Waite

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE
M4M5-RBGP-PRW-CIV-CW02-DPK-0001
SCALES ON THIS A3 SIZE DRAWING
CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona · SAMSUNG C&T · BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5 - RBGP - PRW - CIV - CW02 - DRG - 3011

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGEROAD SITE
CROSS SECTIONS
SHEET 1 OF 2

RMS REGISTRATION No.
PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
ISSUED FOR CONSTRUCTION	-	CW02-DRG-3011	00

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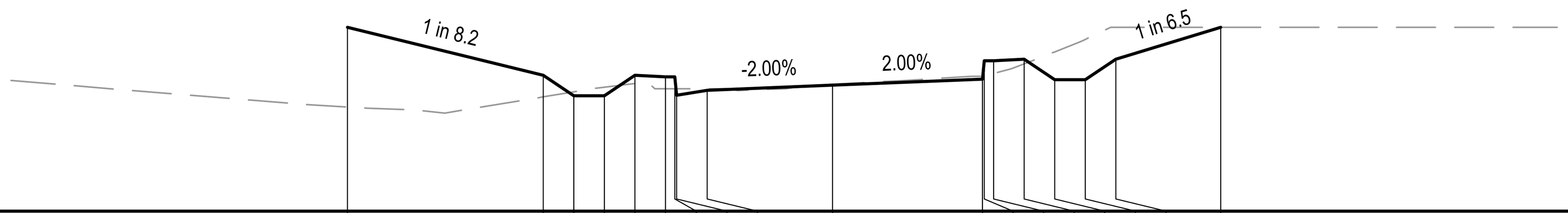
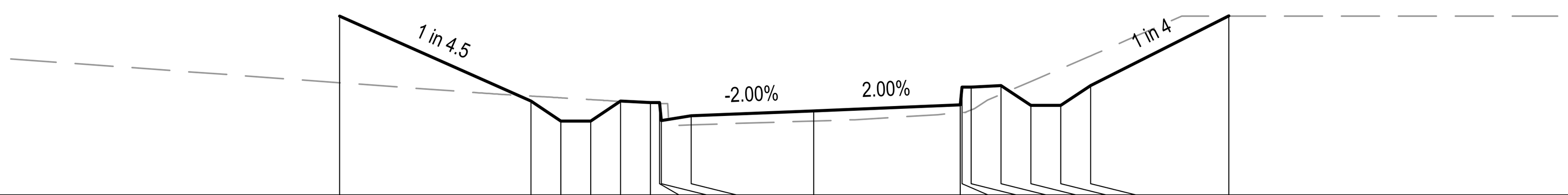


DATUM R.L. 14.00

DESIGN HEIGHT	15.500	15.109	14.943	14.943	15.109	15.097	15.097	14.947	14.987	15.028	15.077	15.227	15.227	15.239	15.073	15.073	15.239	15.502
EXISTING SURFACE	14.850	14.932	14.974	15.012	15.042	15.000	15.000	15.000	15.000	15.036	15.100	15.122	15.123	15.203	15.300	15.401	15.500	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	6.345

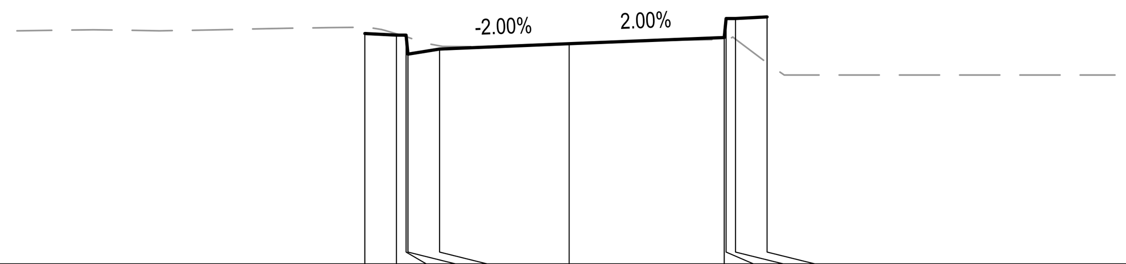
CHAINAGE 100.000



DATUM R.L. 14.00

DESIGN HEIGHT	15.500	14.791	14.624	14.624	14.791	14.778	14.778	14.628	14.668	14.709	14.758	14.908	14.908	14.921	14.754	14.754	14.921	15.501
EXISTING SURFACE	14.944	14.832	14.818	14.802	14.787	14.774	14.770	14.770	14.592	14.624	14.695	14.696	14.716	14.847	14.954	15.061	15.167	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	6.942

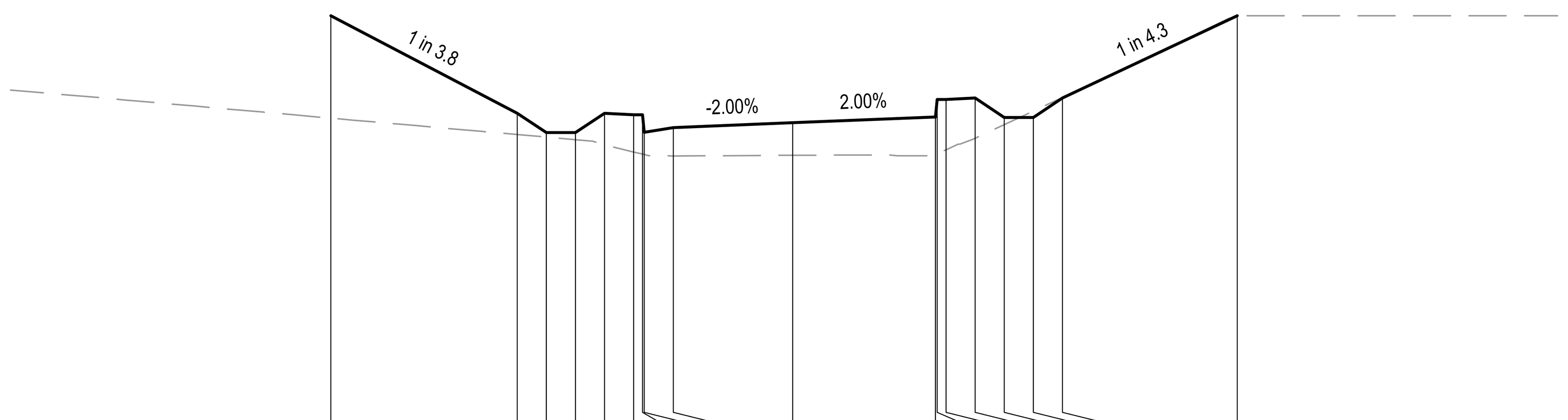
CHAINAGE 90.000



DATUM R.L. 14.00

DESIGN HEIGHT	15.828	15.816	15.816	15.666	15.706	15.747	15.796	15.946	15.946	15.958
EXISTING SURFACE	15.879	15.825	15.804	15.798	15.730	15.747	15.781	15.781	15.783	15.594
OFFSETS	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130

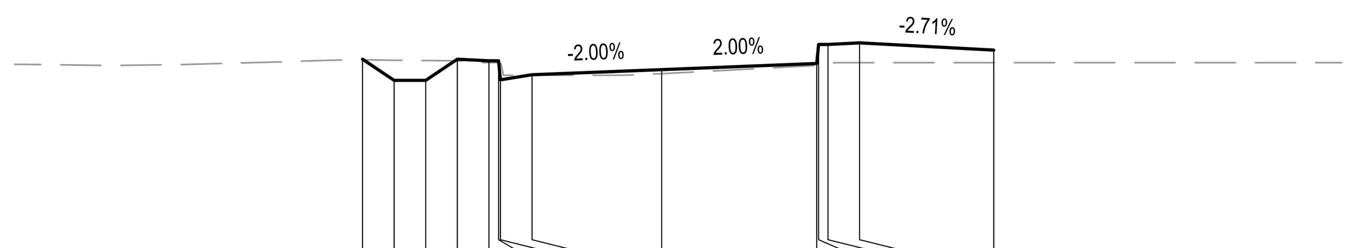
CHAINAGE 117.240



DATUM R.L. 12.00

DESIGN HEIGHT	15.500	14.665	14.498	14.498	14.665	14.652	14.652	14.502	14.542	14.583	14.632	14.782	14.782	14.795	14.628	14.628	14.795	15.500
EXISTING SURFACE	14.623	14.482	14.460	14.438	14.392	14.332	14.314	14.310	14.298	14.304	14.311	14.316	14.351	14.450	14.567	14.683	14.800	15.500
OFFSETS	-7.930	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	3.630	4.130	4.630	7.630

CHAINAGE 80.000



DATUM R.L. 14.00

DESIGN HEIGHT	15.527	15.361	15.361	15.527	15.514	15.514	15.364	15.404	15.445	15.494	15.644	15.644	15.657	15.599
EXISTING SURFACE	15.522	15.520	15.517	15.514	15.500	15.496	15.493	15.400	15.413	15.478	15.478	15.489	15.500	15.500
OFFSETS	-4.730	-4.230	-3.730	-3.230	-2.730	-2.580	-2.550	-2.050	0.000	2.450	2.480	2.630	3.130	5.248

CHAINAGE 110.000

SCALE

A1 (H) 1:100 (V) 1:50
A3 (H) 1:200 (V) 1:100

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50mm ON A3 SIZE ORIGINAL

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C:\Users\chris.waite\Documents\WCX\Drawings\PYRMONT BRIDGE\M4M5-RBGP-PRW-CIV-CW02-DRG-3010.dwg-27/06/2022 7:05:47 AM-Chris.Waite

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE
-				
-				
-				
-				
-				
-				
-				

DESIGN PACKAGE CODE
M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona
SAMSUNG C&T
BOUYGUES CONSTRUCTION AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5 - RBGP - PRW - CIV - CW02 - DRG - 3012

M4-M5 LINK MAIN TUNNEL WORKS

A3

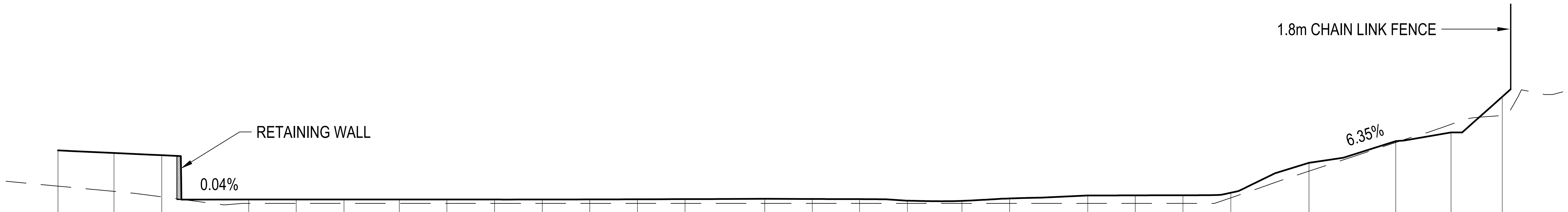
PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGEROAD SITE
CROSS SECTIONS

SHEET 2 OF 2

RMS REGISTRATION No.

PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION
EDMS No.: -
SHEET No.: CW02-DRG-3012
REV: 00



CONTROL LINE XXXX
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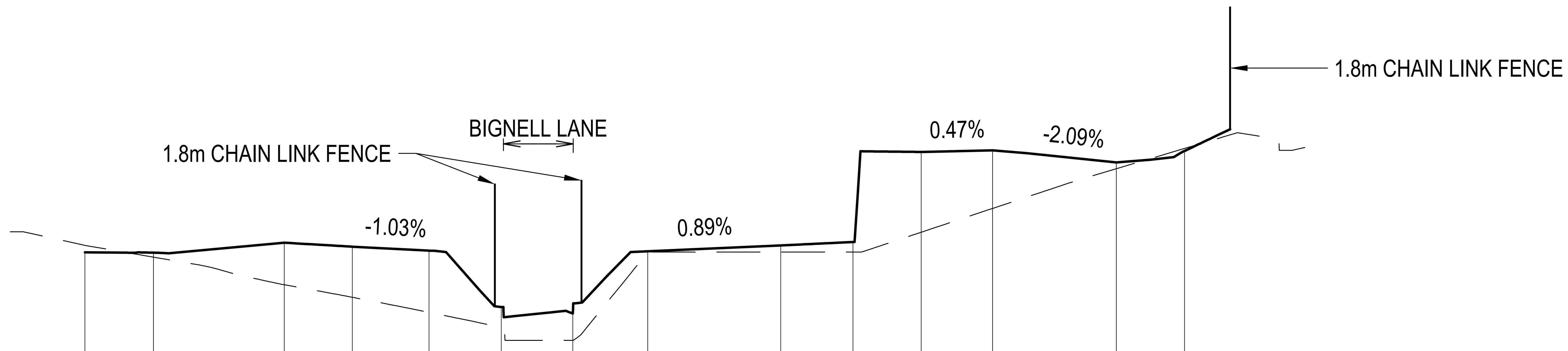
Y = 6248893.964
Z = null

DATUM R.L. 14.00

DESIGN HEIGHT		16.620	16.565	16.519	15.584	15.583	15.583	15.583	15.583	15.583	15.583	15.585	15.588	15.593	15.598	15.594	15.591	15.559	15.554	15.605	15.668	15.670	15.673	15.726	16.358	16.817	17.000	17.752	
EXISTING SURFACE	15.969	15.866	15.755	15.640	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.500	15.619	16.182	16.789	17.172	17.357	17.856

TYPICAL SECTION B/3001
SCALE 1:500(H); 1:100(V)



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DATUM R.L. 12.00

DESIGN HEIGHT		15.498	15.492	15.639	15.580	15.521	14.690	14.595	15.511	15.599	15.649	16.976	17.000	16.821	16.991	
EXISTING SURFACE	15.800	15.599	15.426	15.019	14.835	14.612	14.330	14.200	15.497	15.500	15.500	15.793	16.143	16.729	17.028	17.042

TYPICAL SECTION A/3001
SCALE 1:500(H); 1:100(V)

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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE
M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona | SAMSUNG C&T | BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW- CIV -CW02-DRG-3013

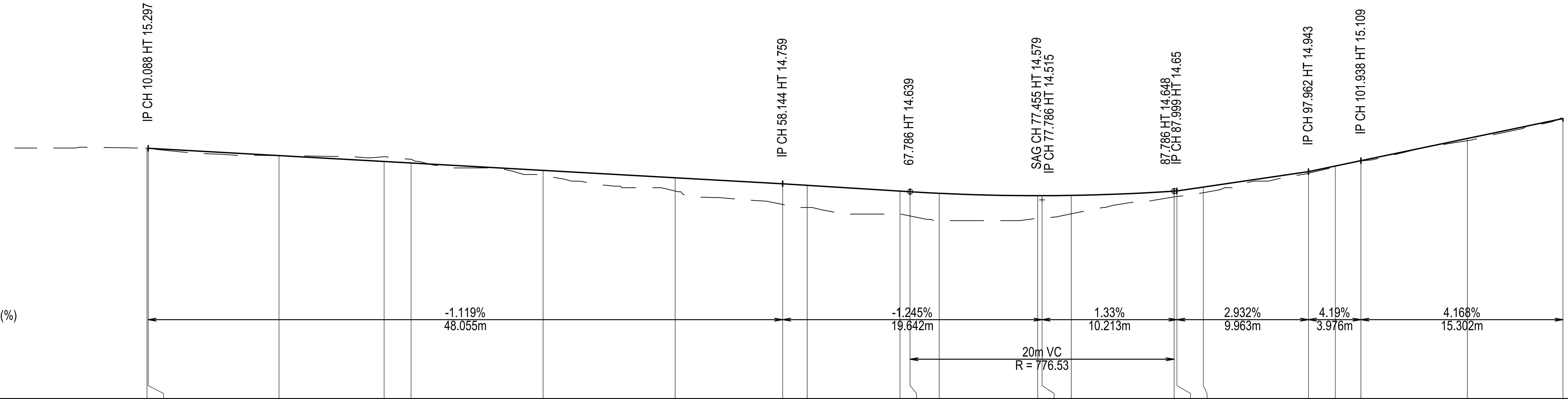
M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGEROAD SITE
CROSS SECTIONS
SHEET 2 OF 2

RMS REGISTRATION No.
PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION
EDMS No.: -
SHEET No.: CW02-DRG-3013
REV: 00



CHAINAGE	EXISTING SURFACE	DESIGN HEIGHT	DEPTH TO EXISTING SURFACE
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10.000	15.300	15.300	0.000
10.088	15.297	15.297	0.000
20.000	15.183	15.186	0.003
27.962	15.170	15.097	-0.073
30.000	15.132	15.074	-0.058
40.000	14.882	14.962	0.080
50.000	14.650	14.850	0.201
58.144	14.446	14.759	0.313
60.000	14.400	14.736	0.336
67.030	14.300	14.649	0.349
67.786	14.271	14.639	0.368
70.000	14.200	14.615	0.415
77.455	14.235	14.579	0.343
77.786	14.239	14.579	0.339
80.000	14.304	14.583	0.279
87.786	14.560	14.648	0.087
87.999	14.567	14.650	0.083
90.000	14.624	14.709	0.085
97.962	14.918	14.943	0.024
100.000	15.036	15.036	0.000
101.938	15.106	15.109	0.003
110.000	15.413	15.445	0.032
117.240	15.747	15.747	0.000

LONGITUDINAL SECTION BIGNELL LANE

HORIZONTAL SCALE 1:200
VERTICAL SCALE 1:40

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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels — acciona, SAMSUNG C&T, BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation

WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3015

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGEROAD SITE
LONGITUDINAL SECTION

SHEET 1 OF 1

RMS REGISTRATION No.

PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
ISSUED FOR CONSTRUCTION	-	CW02-DRG-3015	00

PAVEMENT 2 - PROPOSED BATTER WITH THIN CONCRETE COVER

PAVEMENT 3 - CONCRETE TOPPING ON TOP OF SLAB TO RETAINED

PAVEMENT 4 - ROAD PAVEMENT

PAVEMENT 5 - PROPOSED FLEXIBLE PAVEMENT HARDSTAND

NOTES:

1. REFER TO M4M5-RBGP-PRW-CIV-CW02-3031 FOR PAVEMENT DETAILS

ACCEPTED FOR CONSTRUCTION

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50mm ON A3 SIZE ORIGINAL

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DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
-	00	27.06.22	ISSUED FOR CONSTRUCTION	C.WAITE

DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY

WestConnex M4-M5 Link Tunnels

acciona SAMSUNG C&T BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation

WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3030

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
PAVEMENT PLAN

SHEET 1 OF 1

RMS REGISTRATION No.

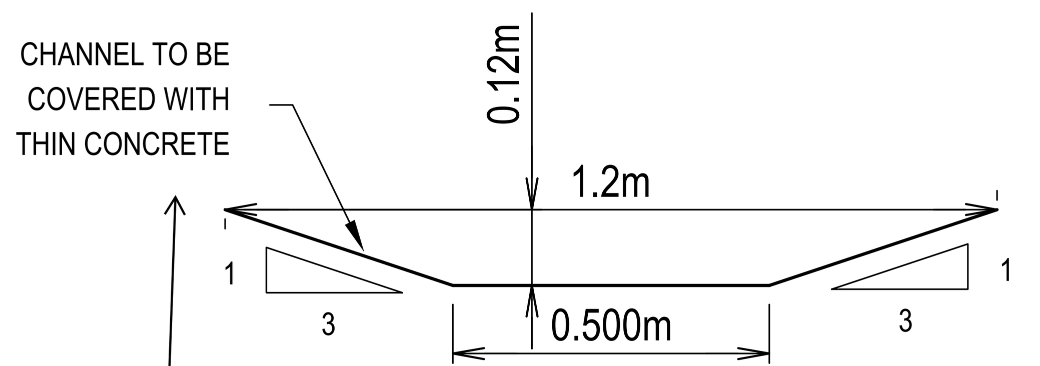
PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION

EDMS No.: -

SHEET No.: CW02-DRG-3030

REV: 00



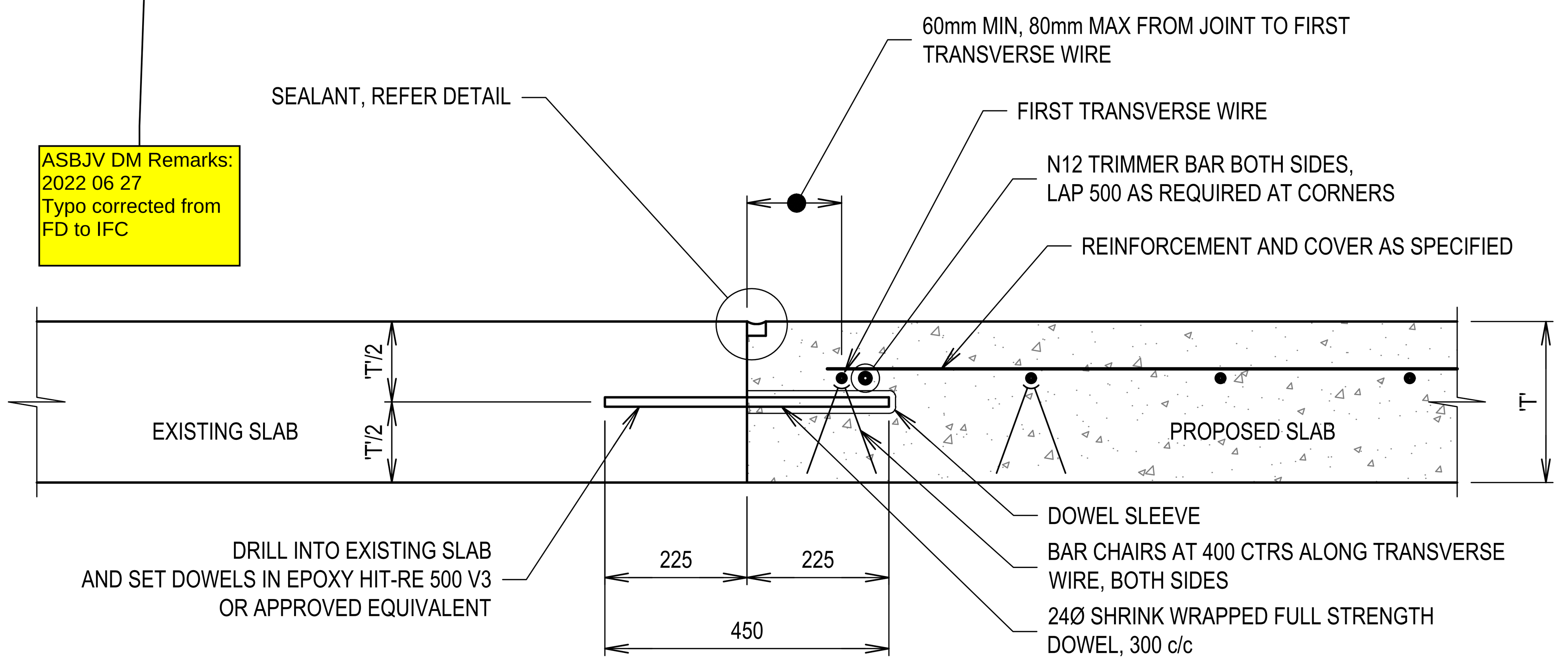
TYPICAL DIVERSION DRAIN DETAIL
SCALE 1:20

HARDSTAND DESIGN NOTE:

3% DESIGN SUBGRADE CBR HAS BEEN ASSUMED FOR DESIGN PURPOSES, THE ACTUAL SUBGRADE CBR IS RECOMMENDED TO BE VERIFIED ON SITE.

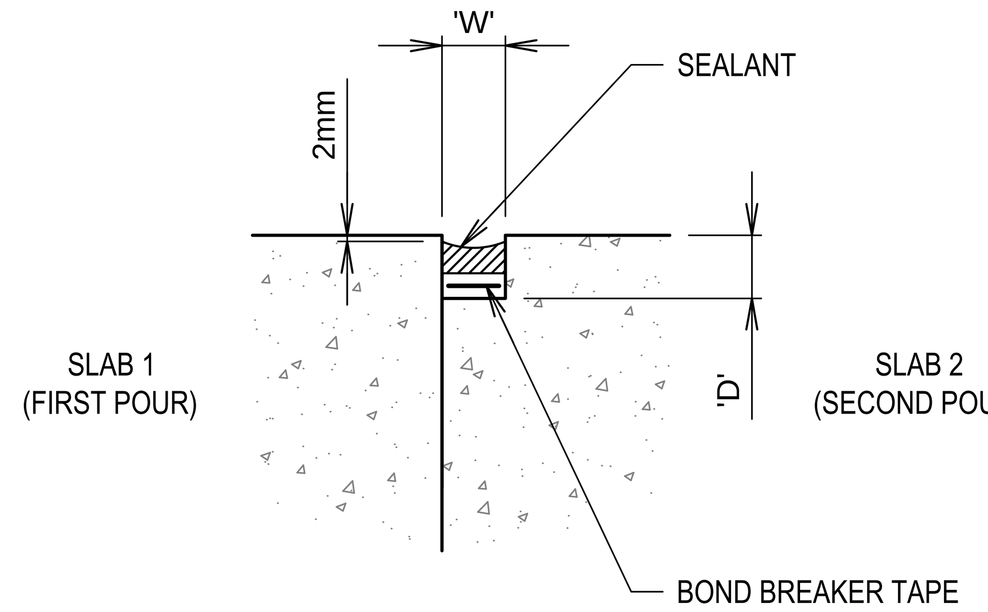
DESIGN TRAFFIC LOADING: 100000 ESA

ASBJV DM Remarks:
2022 06 27
Typo corrected from FD to IFC



CONCRETE REPAIR INTERFACE DETAIL
NOT TO SCALE

NOTES
1. WHERE EXISTING SLAB TOP EDGE IS BADLY CHIPPED SAW CUT PARALLEL TO EDGE AND REMOVE.



MOVEMENT JOINT SEALANT DETAILS
(FOR DCJ, EJ, DEJ, KJ & DDJ JOINTS)
SCALE 1:10

STEPS:
1. FORM REBATE IN SLAB 2 AGAINST FACE OF SLAB 1.
2. AFTER SLAB CURING PERIOD (MIN. 28 DAYS) WASH OUT REBATE USING HIGH PRESSURE WATER. DRY USING HIGH PRESSURE COMPRESSED AIR AND ALLOW ADDITIONAL 16HRS TO DRY THOROUGHLY.
3. INSTALL POLYETHYLENE BOND BREAKER TAPE FOR FULL WIDTH 'W'.
   FOR IJ, EJ AND DEJ JOINTS OMIT BOND BREAKER TAPE.
4. PRIME FACES OF SIDES OF REBATE (REFER SEALANT TABLE)
5. INSTALL SEALANT AS SPECIFIED (REFER SEALANT TABLE) IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SEALANT/PRIMER TYPES

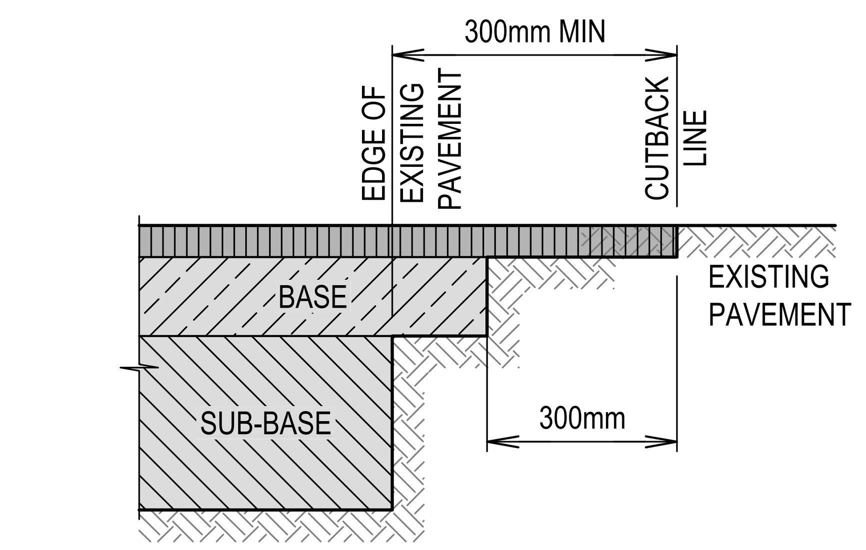
LOCATION	SEALANT	PRIMER
AREAS SUBJECT TO FUEL SPILLAGE	THIOFLEX 600	FOSROC PRIMER 14
OTHER EXTERNAL PAVEMENTS	EMER-ROAD SEAL SL	FOSROC PRIMER 10

NOTES
ALTERNATIVE SEALANTS MUST HAVE:
- MOVEMENT ACCOMMODATION FACTOR +/- 50%
- PRIMER TO MANUFACTURER'S SPECIFICATION
- INSTALLATION TO MANUFACTURER'S RECOMMENDATIONS
- PRIOR APPROVAL BY SUPERINTENDENT.

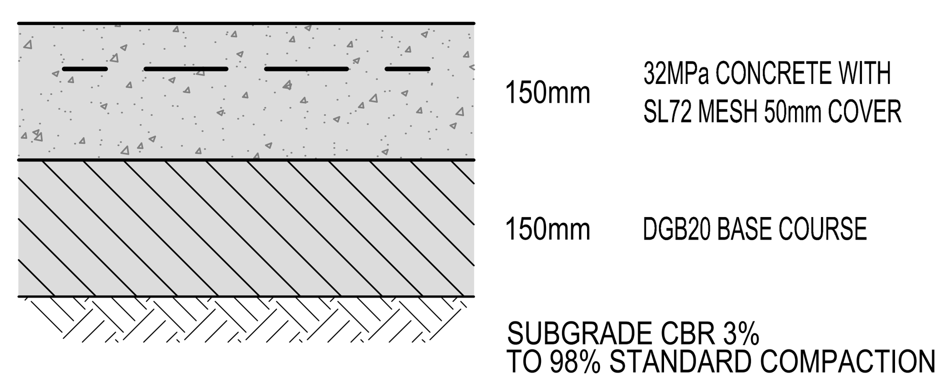
SEALANT DIMENSIONS

MEAN SLAB LENGTH (m)	SEALANT WIDTH 'W' (mm)	SEALANT DEPTH 'D' (mm)
≤ 4	7 ± 1	7 ± 1
5	9 ± 2	7 ± 1
6	9 ± 2	7 ± 1
7	10 ± 2	8 ± 1
8	11 ± 2	9 ± 2
9	12 ± 2	10 ± 2
10	13 ± 2	10 ± 2
11	14 ± 2	11 ± 2
12	15 ± 2	12 ± 2

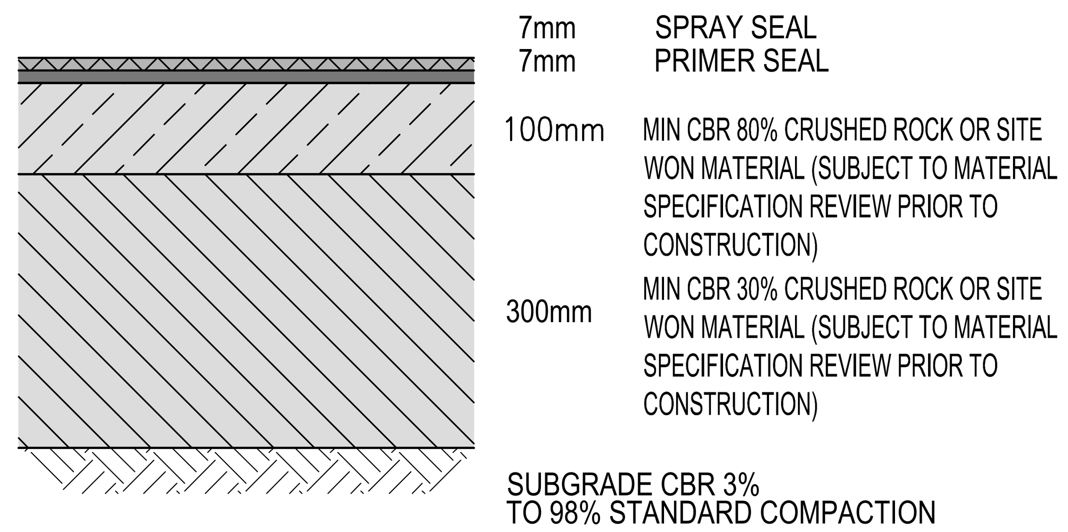
NOTE:
THIS TABLE APPLIES TO EXTERNAL PAVEMENTS. FOR JOINTS WITHIN BUILDINGS REFER TO STRUCTURAL DETAILS.



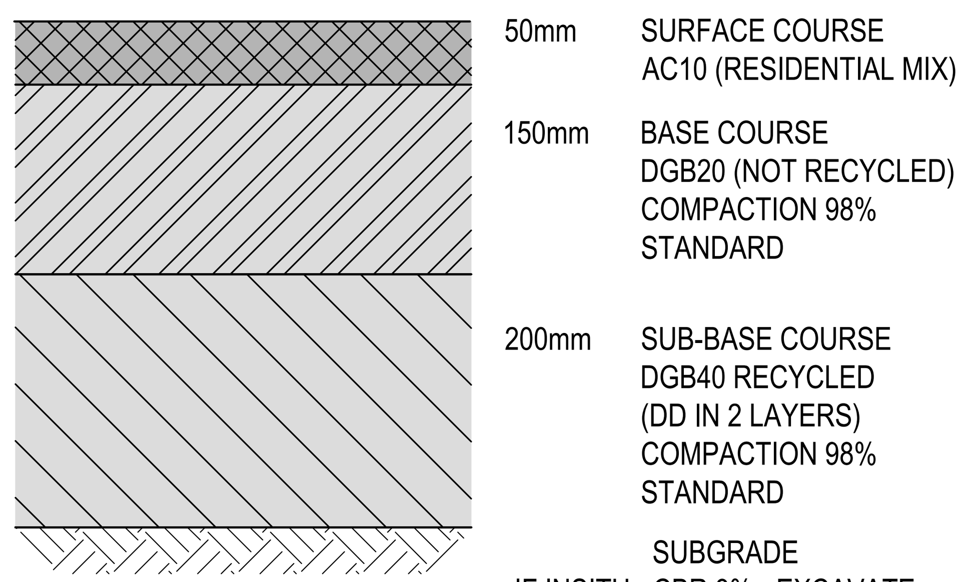
TYPICAL EXISTING PAVEMENT CUT-BACK DETAIL
SCALE 1:20



CONCRETE REPAIR DETAIL
NOT TO SCALE

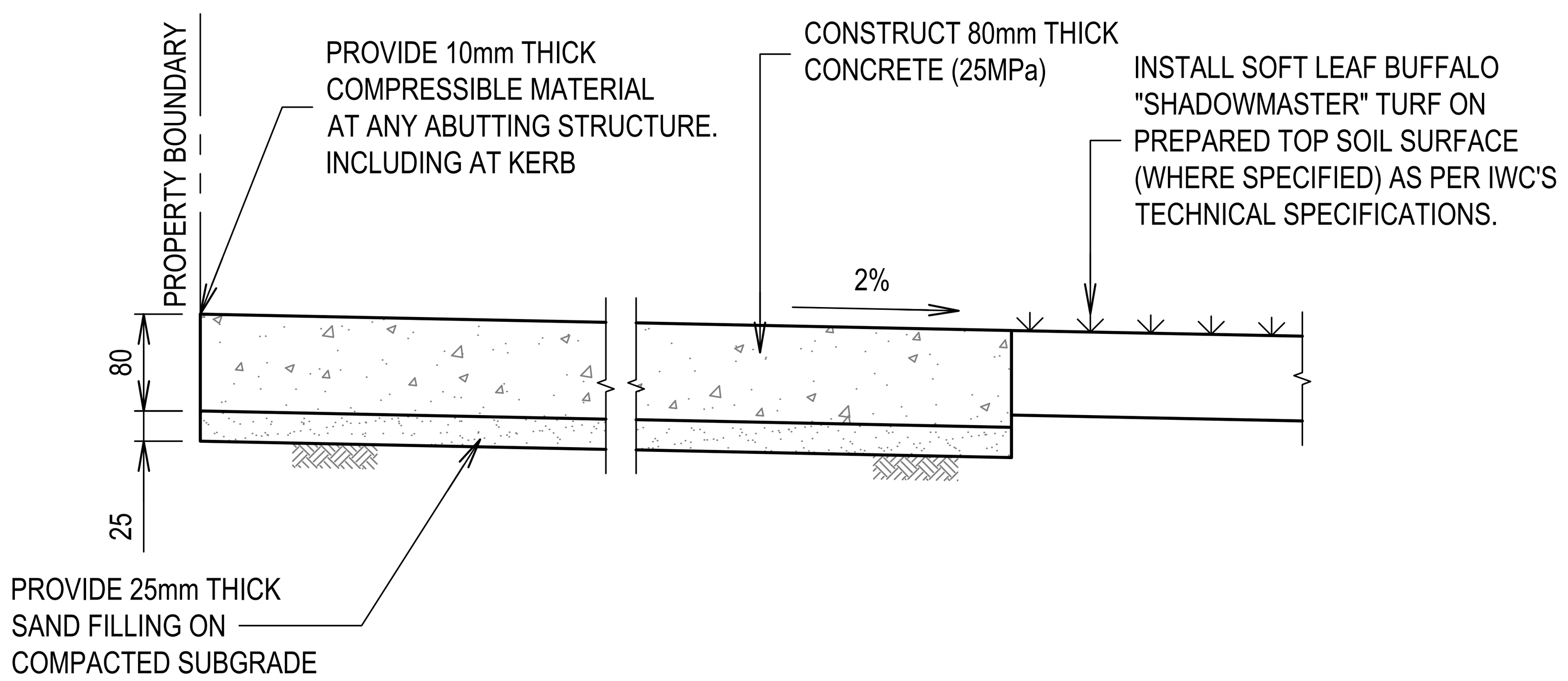


FLEXIBLE PAVEMENT HARDSTAND
NOT TO SCALE



ROAD PAVEMENT
NOT TO SCALE

SUBGRADE
IF INSITU <CBR 3% - EXCAVATE 150mm AND PLACE EITHER:
A. RECYCLED ROAD BASE (PREFEREABLY RECOVERED FROM JOB SITE) OR
B. CEMENT TREATED ROAD (2000MPa) IF VERY POOR SUBGRADE, LIGHTLY COMPACTED



FOOTPATH PAVEMENT DETAIL
SCALE 1:10

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C:\Users\chris.waite\Documents\WCX\Drawings\PYRMONT BRIDGE\M4M5-RBGP-PRW-CIV-CW02-DRG-3030.dwg-27/06/2022 7:18:27 AM-Michael.Arellano

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	REV	DATE	AMENDMENT / REVISION DESCRIPTION	APPROVAL
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DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56 — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels — acciona, SAMSUNG C&T, BOUYGUES AUSTRALIA

TITLE	NAME	DATE
DRAWN	M.ARELLANO	31.03.22
DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3031

M4-M5 LINK MAIN TUNNEL WORKS

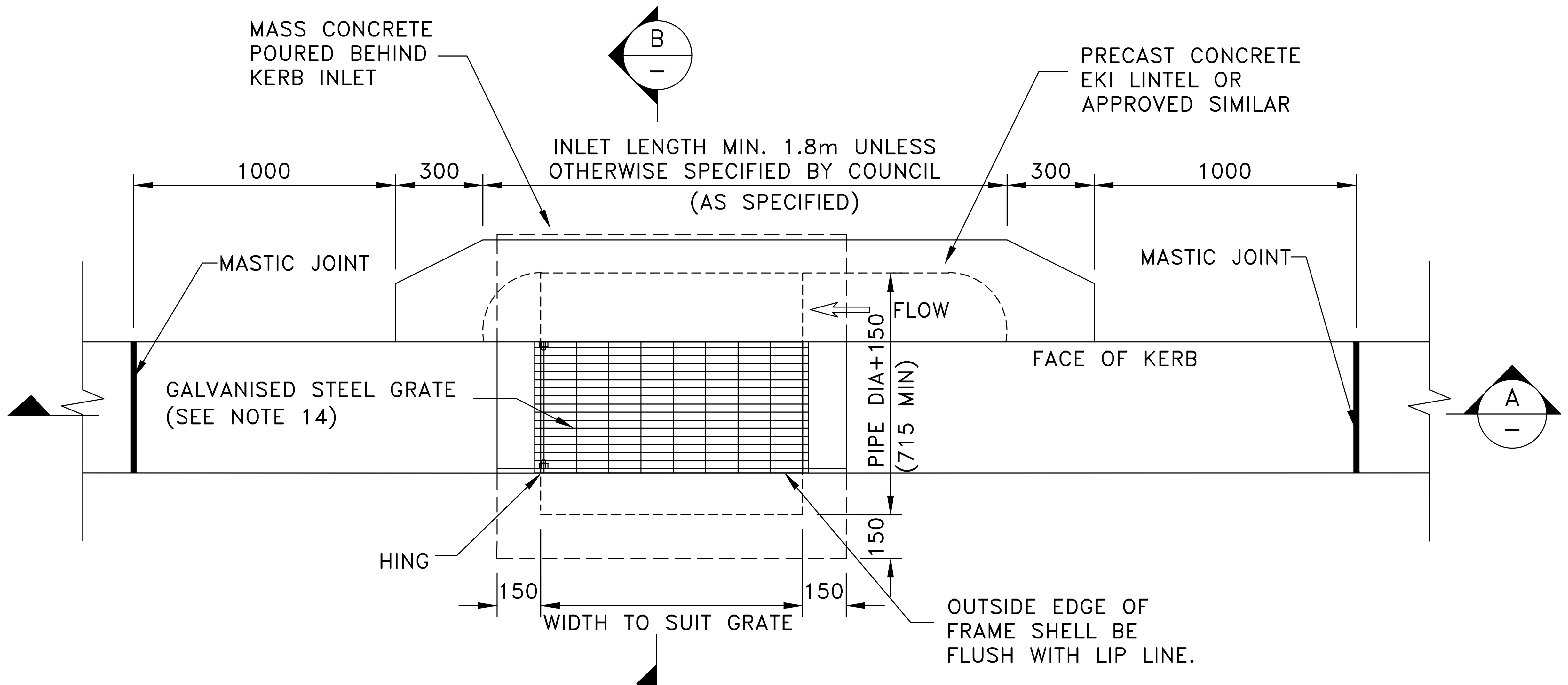
A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
PAVEMENT DETAILS

SHEET 1 OF 1

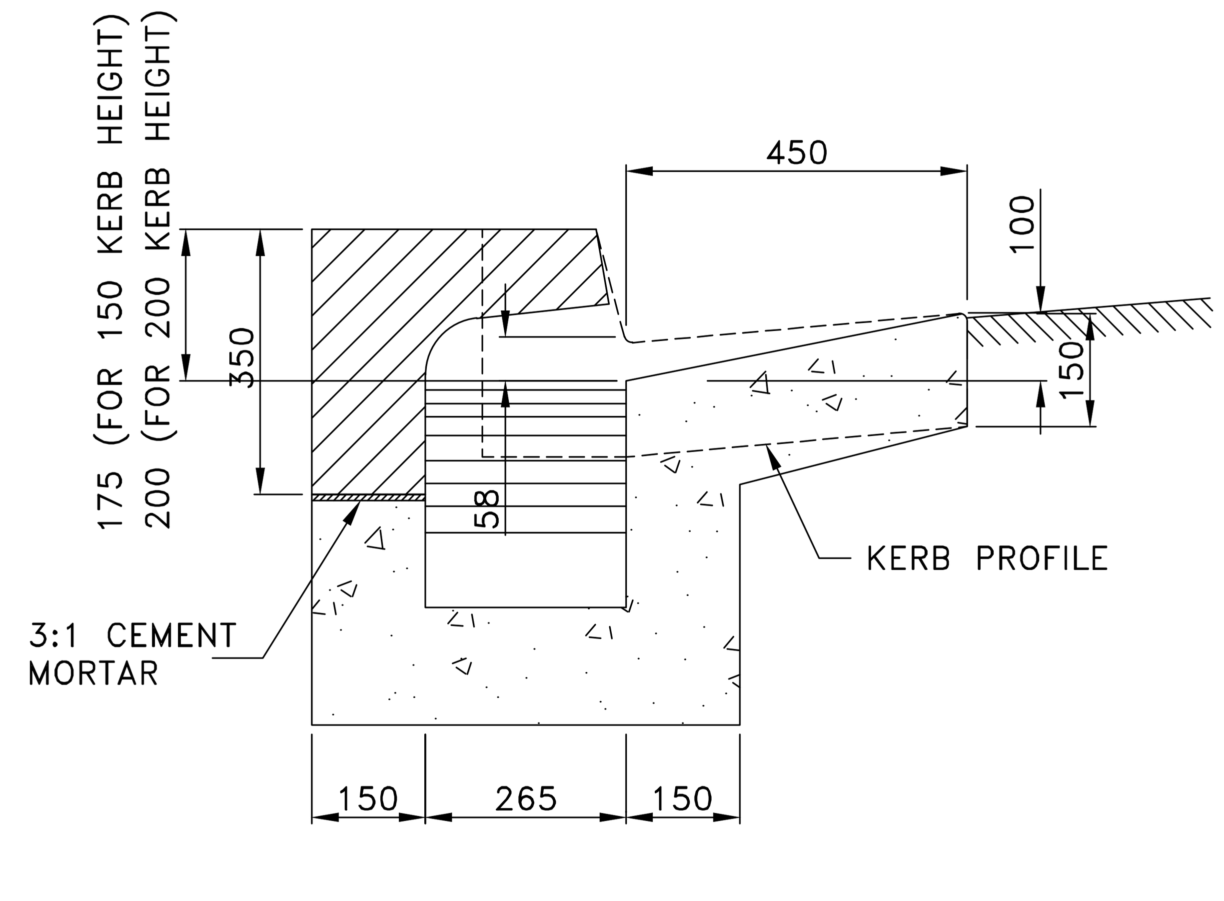
RMS REGISTRATION No. — PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION — EDMS No.: - — SHEET No.: CW02-DRG-3031 — REV: 00



PLAN

NOT TO SCALE

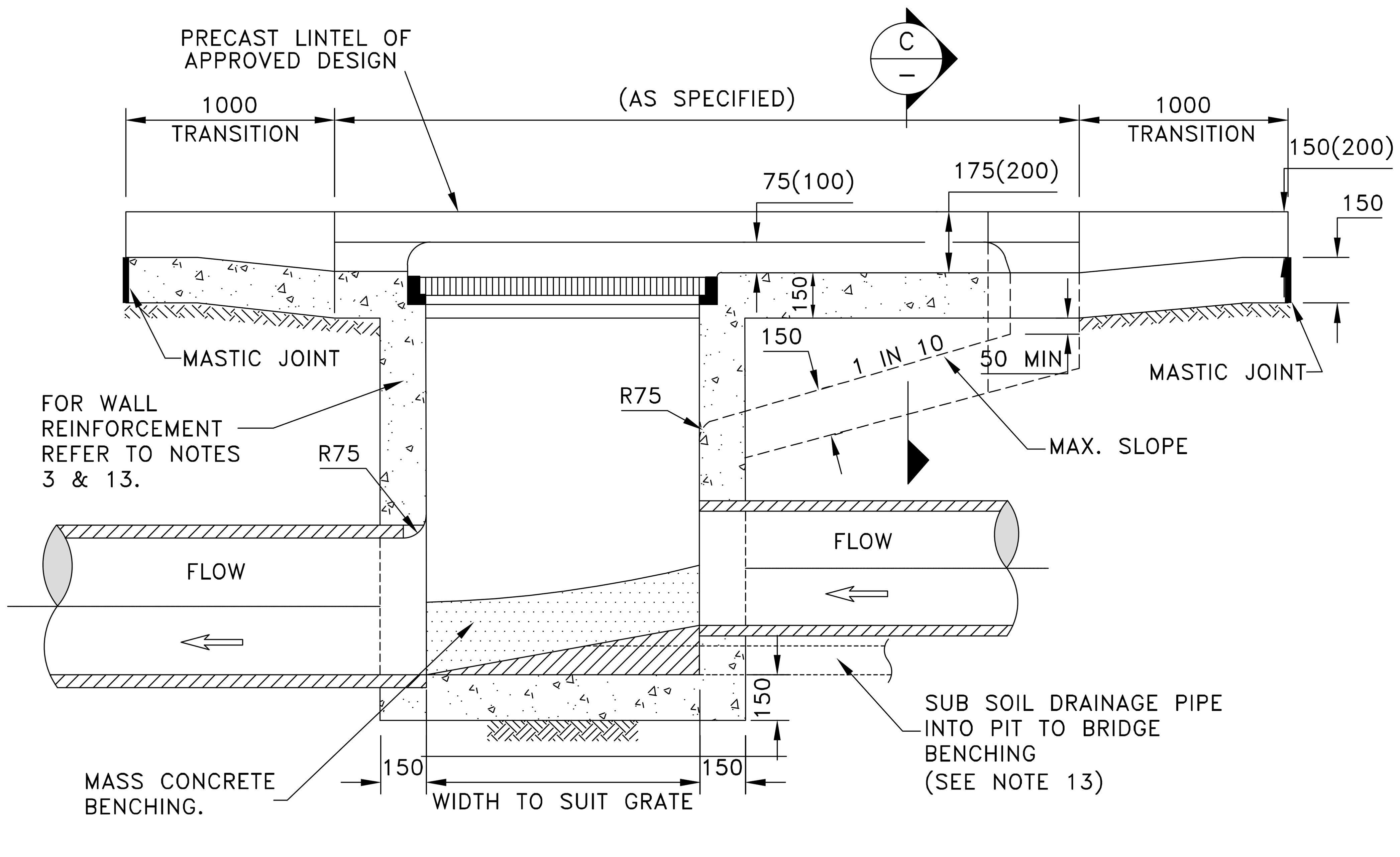


SECTION C

SCALE 1:20

NOTE:

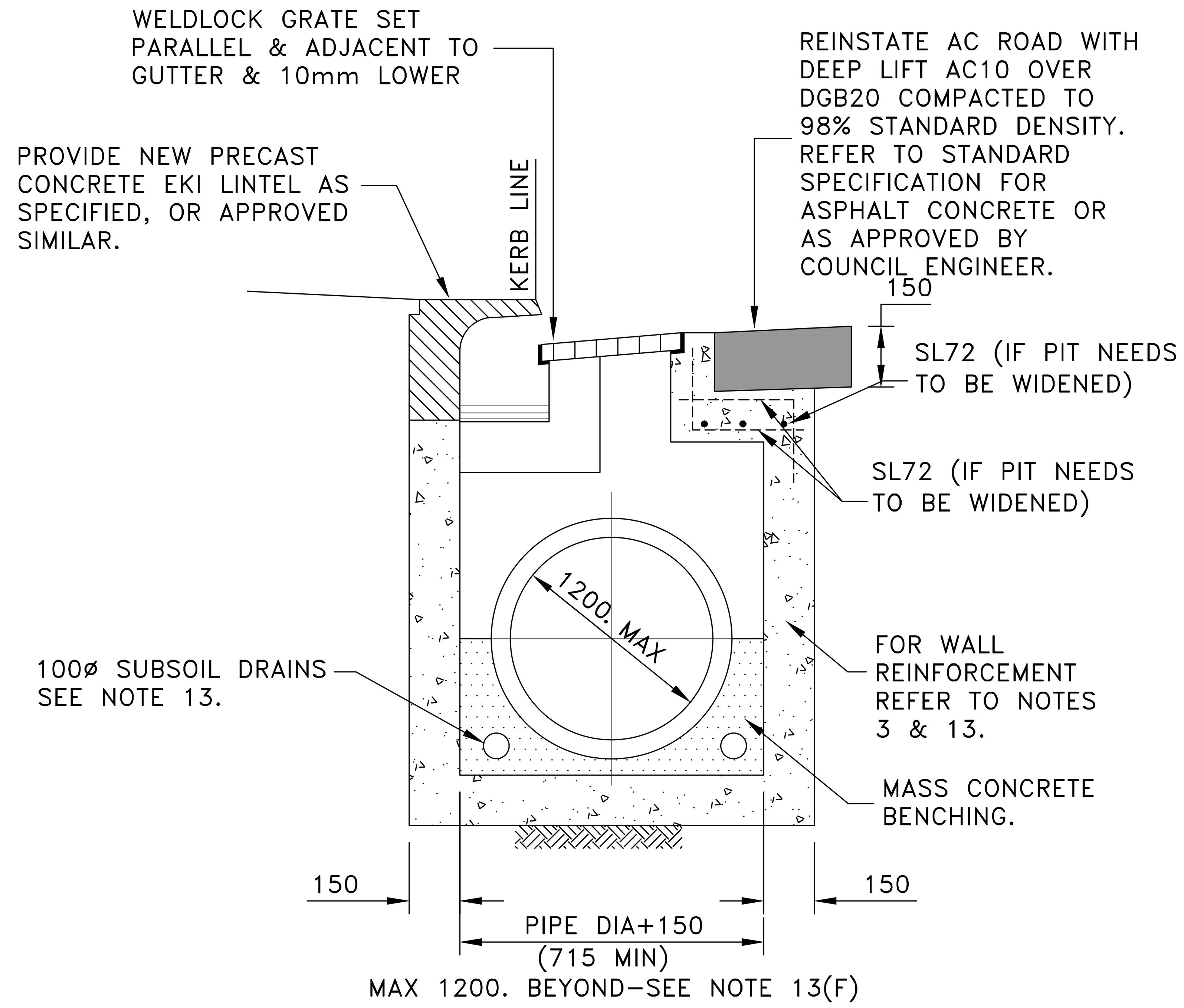
BONDEK SLAB (OR APPROVED SIMILAR) CAN BE USED IF APPROVED BY COUNCIL ENGINEER AND IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.



SECTION A

NOT TO SCALE

NOTE: PLAN BASED ON 150 KERB
(FIGURES IN BRACKETS – 200 KERB)



SECTION B

NOT TO SCALE

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50mm ON A3 SIZE ORIGINAL

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SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels — acciona, SAMSUNG C&T, BOUYGUES AUSTRALIA

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PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3032

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
GRATED GULLY PIT WITH EXTENDED EKI DETAIL

SHEET 1 OF 1

RMS REGISTRATION No.
PART 1

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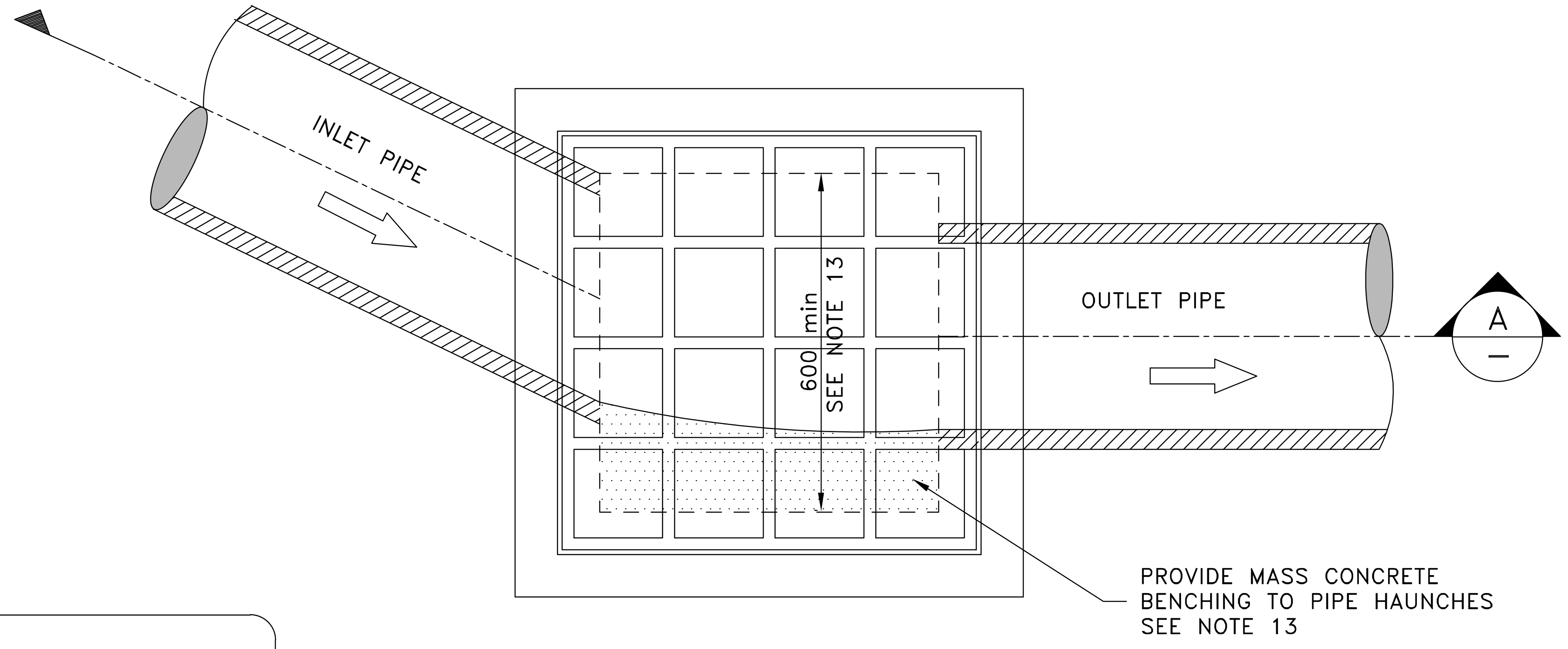
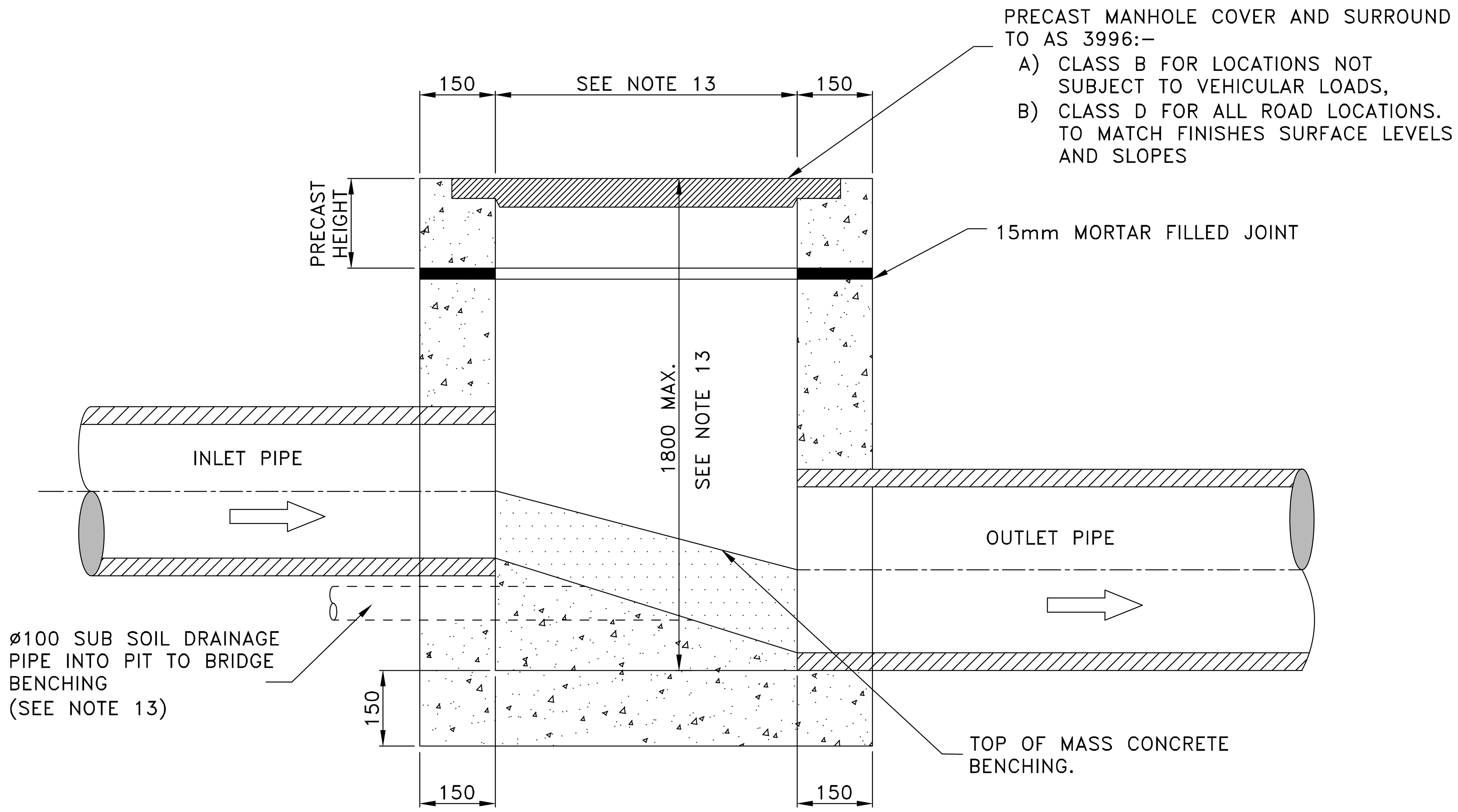


PLAN

NOTE:

PIT COVER LID WILL BE 600x900 UNLESS OTHERWISE APPROVED BY COUNCIL



SECTION A

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SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56
HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY
WestConnex M4-M5 Link Tunnels
acciona
SAMSUNG C&T
BOUYGUES AUSTRALIA

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Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW- CIV -CW02-DRG-3033

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
JUNCTION PIT DETAIL

SHEET 1 OF 1

RMS REGISTRATION No.

PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
ISSUED FOR CONSTRUCTION	-	CW02-DRG-3033	00

DRAINAGE NOTES 1:

1. CONCRETE STRENGTH

A) KERB, KERB & GUTTER, FOOTPATH, CYCLEWAY, VEHICLE CROSSING, PRAM RAMP, EDGE STRIP: 25MPA @ 28 DAYS
B) DISH CROSSING, ROAD PLATFORM/HUMP, ROAD SLAB: 40MPA @ 28 DAYS
C) PIT: 25MPA @ 28 DAYS
D) FOR TRAFFICKED AREAS WHERE FACILITY MUST BE OPEN TO TRAFFIC WITHIN 12 HOURS (EG VEHICLE CROSSING, ROAD SLAB, DISH CROSSING, ROAD PLATFORM/HUMP: 40 MPA WITH ACCELERATOR SUCH AS 2% CACL (REFER TO SP40HC).

2. CONCRETE FINISH

A) KERB, GUTTER, LAYBACK, DISH CROSSING, PIT (OUTER EXPOSED) - STEEL TROWEL
B) VEHICLE CROSSINGS, FOOTPATH, CYCLEWAY, ROAD SLABS, PRAM RAMP, ROAD HUMPS/RAMPS - BROOM/BRUSH.
C) PIT (INTERNAL): WOOD FLOAT.
D) ALL GAPS AND SPACES IN THE CONCRETE SHELL BE RENDERED SMOOTH. A.G. GAPS AROUND ALL PIPES, UNDER GRATES/LIDS AND LINTELS AND BETWEEN CONCRETE POURS.

3. REINFORCEMENT

A) TO AS 4671
B) MINIMUM COVER: 50MM

4. EXCAVATION

A) AT ALL JOINS TO EXISTING CONCRETE/ASPHALT – THE JOIN SHALL BE SAW CUT BEFORE EXCAVATION.
B) ALL EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A LICENSED WASTE DISPOSAL FACILITY.

5. ROAD BASE

A) COMPACTION: 95% STANDARD.
B) RECYCLED DGB SPECIFICATION: FOR SUPPLY OF RECYCLED MATERIAL FOR PAVEMENTS, EARTHWORKS, AND DRAINAGE REFER TO SPECIFICATION FOR SUPPLY OF RECYCLED MATERIAL FOR PAVEMENTS, EARTHWORKS AND DRAINAGE' BY IPWEA (NSW) (LATEST EDITION).

6. RESTORATION OF ADJOINING ROAD PAVEMENT AND EXCAVATION BACKFILL

A) SEE STANDARD PLAN D7.

7. UTILITIES, SERVICES & SURVEY MARKS

A) ALL UNDERGROUND UTILITY SERVICES SHALL BE CHECKED FOR LEVEL AND LOCATION PRIOR TO COMMENCEMENT OF WORKS, BY THE CONTRACTOR.
B) ALL SERVICE COVERS AFFECTED BY THE WORKS SHALL BE ADJUSTED AS REQUIRED AND TO SUIT THE LEVELS OF THE NEW WORK. NO SERVICE FITTINGS SHALL BE COVERED.
C) PROPERTY STORMWATER PIPES: WHERE AFFECTED, SHALL BE REPLACED WITH 90MM UPVC OR TO SUIT EXISTING AND INVERT SHALL MATCH THE GUTTER LEVEL.
D) STATE SURVEY MARKS (SSM'S) – SHALL NOT BE DISTURBED UNLESS APPROVED BY THE COUNCIL ENGINEER.
E) AT ALL LIGHT/POWER POLES, THE CONCRETE SHALL BE ENDED 150MM CLEAR OF THE POLE AND THE GAP FILLED WITH 30MM OF 10MM COLDMIX/ASPHALTIC CONCRETE.

8. NATURE STRIP RESTORATION

A) MATCH EXISTING TURF.
B) IF NEW TURF IS SPECIFIED – USE SOFT LEAF BUFFALO 'SHADEMASTER', LAID ON 100MM THICK PREPARED TOPSOIL, AS SPECIFIED BY THE COUNCIL ENGINEER.

9. EXISTING SIGNAGE

A) SUCH SIGNAGE SHALL BE REINSTATED UNLESS THE COUNCIL ENGINEER ADVISES OTHERWISE.
B) SIGNS REPLACED OR NEW, WITHIN THE NEW CONCRETE SHALL BE INSTALLED WITH A V-LOK.
C) HERITAGE STREET NAME SIGNS EMBEDDED IN FOOTPATH PAVING AND KERBS – CAUTION SHALL BE EXERCISED TO NOT DAMAGE THESE SIGNS AND THE CONTRACTOR SHALL LIAISE WITH THE COUNCIL ENGINEER TO DETERMINE WHAT ACTION TO IMPLEMENT WHERE DISTURBANCE OF THE SIGN IS ESSENTIAL.

10. ASPHALTIC CONCRETE

A) SHALL CONFORM TO RMS SPECIFICATION R116 – 'ASPHALT (DENSE AND OPEN GRADED)'.

11. RESIDENT NOTIFICATION

A) ALL RESIDENTS AFFECTED BY THE WORKS SHALL BE NOTIFIED AT LEAST 2 WORKING DAYS BEFORE THE RELEVANT WORK COMMENCES AND ANY REASONABLE REQUESTS ACCOMMODATED.

12. SAFETY/SIGNAGE/ACCESS

A) DURING CONSTRUCTION, ADEQUATE WARNING SIGNS AND BARRICADING SHALL BE PROVIDED TO ENSURE THAT THE WORK SITE MEETS THE REQUIREMENTS OF AS 1742.2 & 1743.3, AND TO PROVIDE ADEQUATE PROTECTION TO PEDESTRIANS & MOTORISTS.
B) ADEQUATE AND SAFE ACCESS FOR PEDESTRIANS SHALL BE PROVIDED AT ALL TIMES.
C) AT DRIVEWAYS - PREVENTION OF ACCESS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AND ARRANGEMENTS SHALL BE MADE WITH THE RESIDENT/BUSINESS, BY THE CONTRACTOR, FOR A SUITABLE DAY/TIME FOR THIS WORK. USE OF HIGHER STRENGTH CONCRETE, WITH SHORTER CURING TIME MAY BE NECESSARY.

13. PIT DETAILS

A) PROVIDE STEP IRONS WHERE PIT IS DEEPER THAN 1.0M – REFER TO STANDARD PLAN D6.
B) TOP OF BENCHING SHALL BE HALF OF OUTLET PIPE DIAMETER.
C) 100MM DIA CORRUGATED SUBSOIL PIPE, 3M LONG, WRAPPED IN FILTER FABRIC, SHALL BE PROVIDED AT THE INVERT LEVEL ON BOTH SIDES OF EVERY INLET PIPE.
D) WHERE POSSIBLE, LOCATE LINTELS CENTRALLY IN SAG POINTS.
E) APPROVED PRECAST CONCRETE PITS (PART OR TOTAL) MAY BE USED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
F) WHERE THE EXTENDED CHAMBER WIDTH EXCEEDS 1.2M, PIT REINFORCEMENT SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.
G) FOR PIT DEPTHS LESS THAN 1.5M, NO REINFORCEMENT IS REQUIRED. FOR PIT DEPTHS BETWEEN 1.5M AND 3.0M,PROVIDE SL72 AT 50MM COVER TO INSIDE FACE WALLS AND BASE. PROVIDE 400MM LAP AT CORNERS. FOR PIT DEPTHS GREATER THAN 3.0, DESIGN IS REQUIRED BY A PROFESSIONAL ENGINEER.
H) FOR JUNCTION AND SURCHARGE PITS, THE MINIMUM INTERNAL DIMENSIONS SHALL BE:
(I) DEPTH LESS THAN 1800MM – 900X900MM UNLESS OTHERWISE APPROVED BY COUNCIL.
(II) DEPTH GREATER THAN 1800MM – REFER TO STANDARD PLAN D3.

14. STORMWATER PIT GRATES

A) SHALL BE WELDLOK HINGED HOT DIPPED GALVANISED GG78-50 (OR APPROVED EQUIVALENT), SET PARALLEL TO GUTTER, AND WITH LOCKING CLIP. FOR INDUSTRIAL ROADS AND WHERE DIRECTED BY THE COUNCIL ENGINEER, USE WELDLOK HINGED HOT DIPPED GALVANISED GG78-42A (OR APPROVED EQUIVALENT).
B) THE GRATE WHEN OPEN SHALL CLEAR THE LINTEL/KERB.

15. DIMENSIONS

A) ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.

16. GENERAL

A) ALL WORKS SHALL BE CARRIED OUT TO COUNCIL'S SPECIFICATION, TO BEST PRACTICE STANDARDS, AND TO THE SATISFACTION OF COUNCIL'S SUPERVISING ENGINEER.
B) THE WORK SITE SHALL BE KEPT IN A CLEAN, TIDY, AND SAFE CONDITION AT ALL TIMES AND TO THE SATISFACTION OF COUNCIL'S ENGINEER.

17. DOCUMENT PRIORITY

A) THIS PLAN SUPERSEDES ANY STATEMENTS ON OTHER DOCUMENTS, EG SPECIFICATIONS, OTHER PLANS, ETC, UNLESS ADVISED BY THE COUNCIL ENGINEER.

18. INSPECTIONS

INSPECTIONS BY THE COUNCIL SUPERVISING ENGINEER SHALL BE REQUIRED AT THE FOLLOWING STAGES AND AS OTHERWISE DIRECTED BY THE COUNCIL ENGINEER:-
A) EXCAVATION COMPLETED.
B) PITS FORMED
C) BASE AND WALLS OF PITS POURED.
D) LINTELS AND GRATES PLACES AND FORMWORK IN PLACE.
E) TOTALLY COMPLETED.

ACCEPTED FOR CONSTRUCTION

DRAWING FILE LOCATION \ NAME - PLOT DATE \ TIME - PLOT BY
C:\Users\chris.waite\Documents\WCX\Drawings\PYRMONT BRIDGE\M4M5-RBGP-PRW-CIV-CW02-DRG-3030.dwg-27/06/2022 7:20:04 AM-Michael.Arellano

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DESIGN PACKAGE CODE: M4M5-RBGP-PRW-CIV-CW02-DPK-0001

SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56 | HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: WestConnex M4-M5 Link Tunnels

TITLE	NAME	DATE
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PROJECT MNGR	C.WAITE	31.03.22

DOCUMENT NUMBER: M4M5-RBGP-PRW-CIV-CW02-DRG-3034

M4-M5 LINK MAIN TUNNEL WORKS — A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
DRAINAGE NOTES — SHEET 1 OF 1

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CO-ORDINATE SYSTEM: MGA ZONE 56
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DRAWINGS / DESIGN PREPARED BY
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acciona
SAMSUNG C&T
BOUYGUES CONSTRUCTION AUSTRALIA

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Sydney Motorway Corporation
WestConnex

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
LEFT IN PLACE UNDERGROUND STRUCTURES PILES DRAWING SHEET 1 OF 1

RMS REGISTRATION No.
PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
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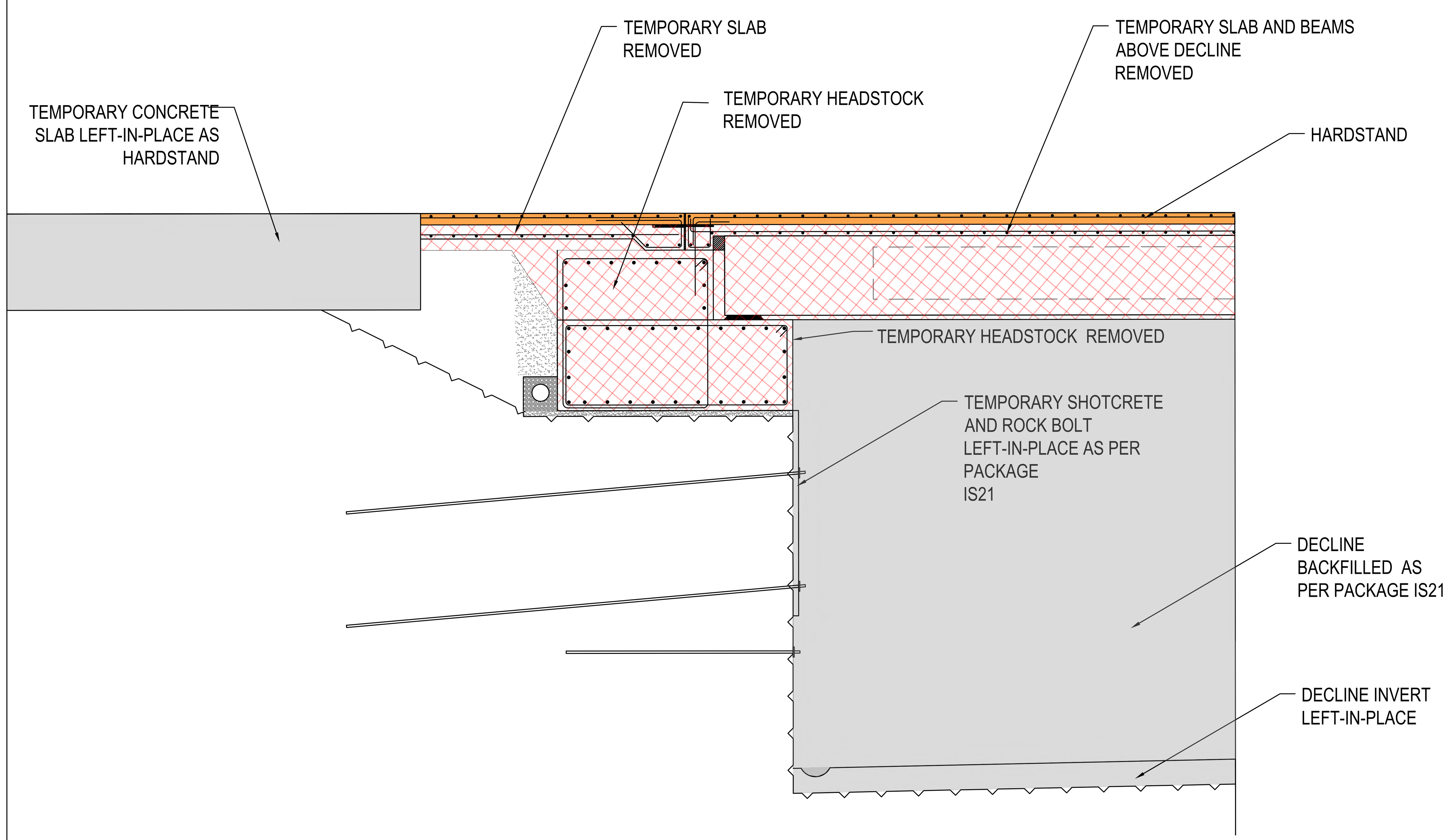
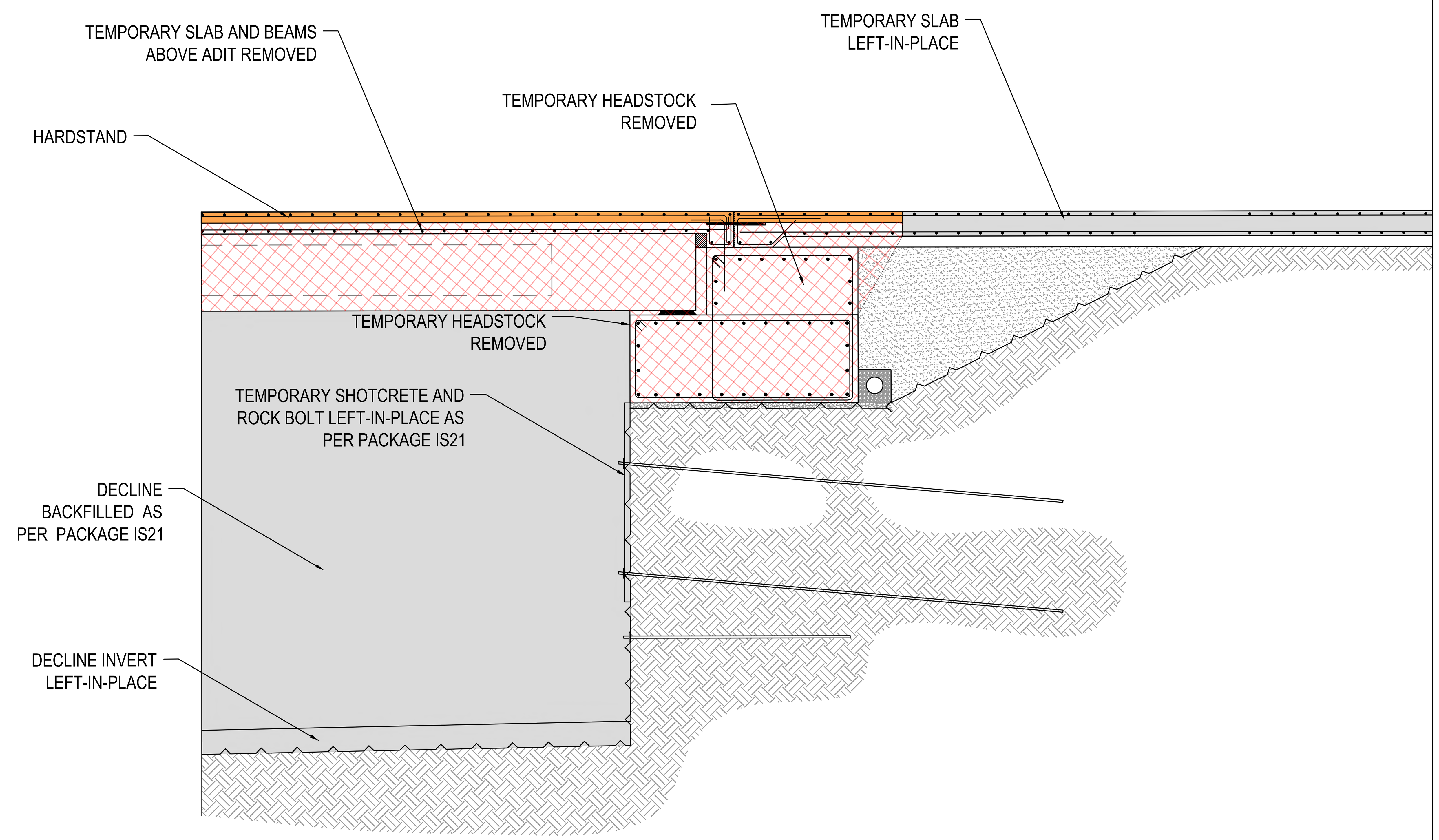
LEGEND

UNDER GROUND STRUCTURES TO BE REMOVED

PROPOSED NEW FLEXIBLE PAVEMENT HARDSTAND



SECTION A 3050



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TITLE	NAME	DATE
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DRG CHECK	J.SUN	31.03.22
DESIGN	J.SUN	31.03.22
DESIGN CHECK	J.SUN	31.03.22
DESIGN VERIFIER	C.WAITE	31.03.22
DESIGN MNGR	C.WAITE	31.03.22
PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW-CIV-CW02-DRG-3051

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES

SHEET 1 OF 6

RMS REGISTRATION No.
PART 1

ISSUE STATUS: ISSUED FOR CONSTRUCTION
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LEGEND

UNDER GROUND STRUCTURES TO BE REMOVED

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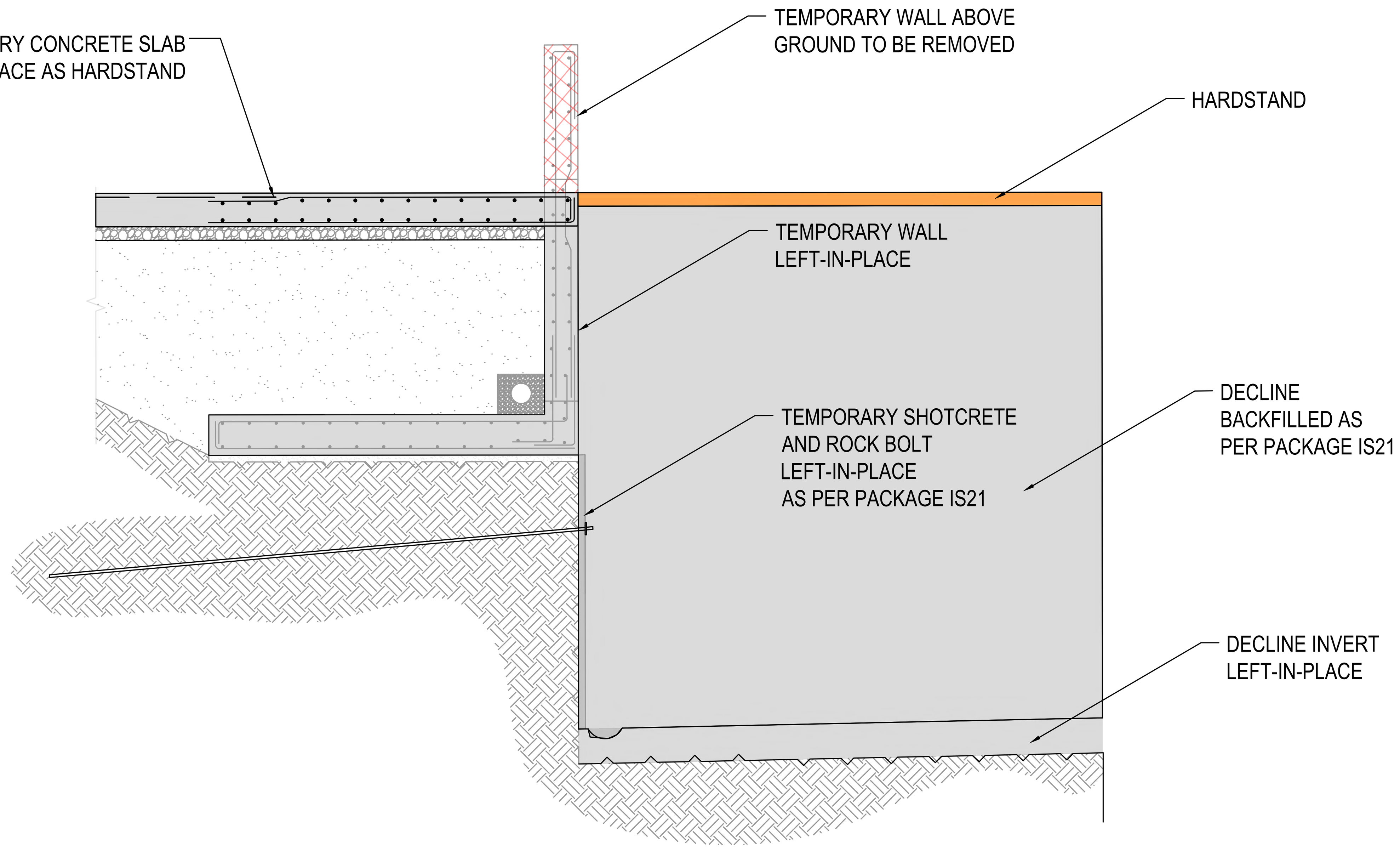

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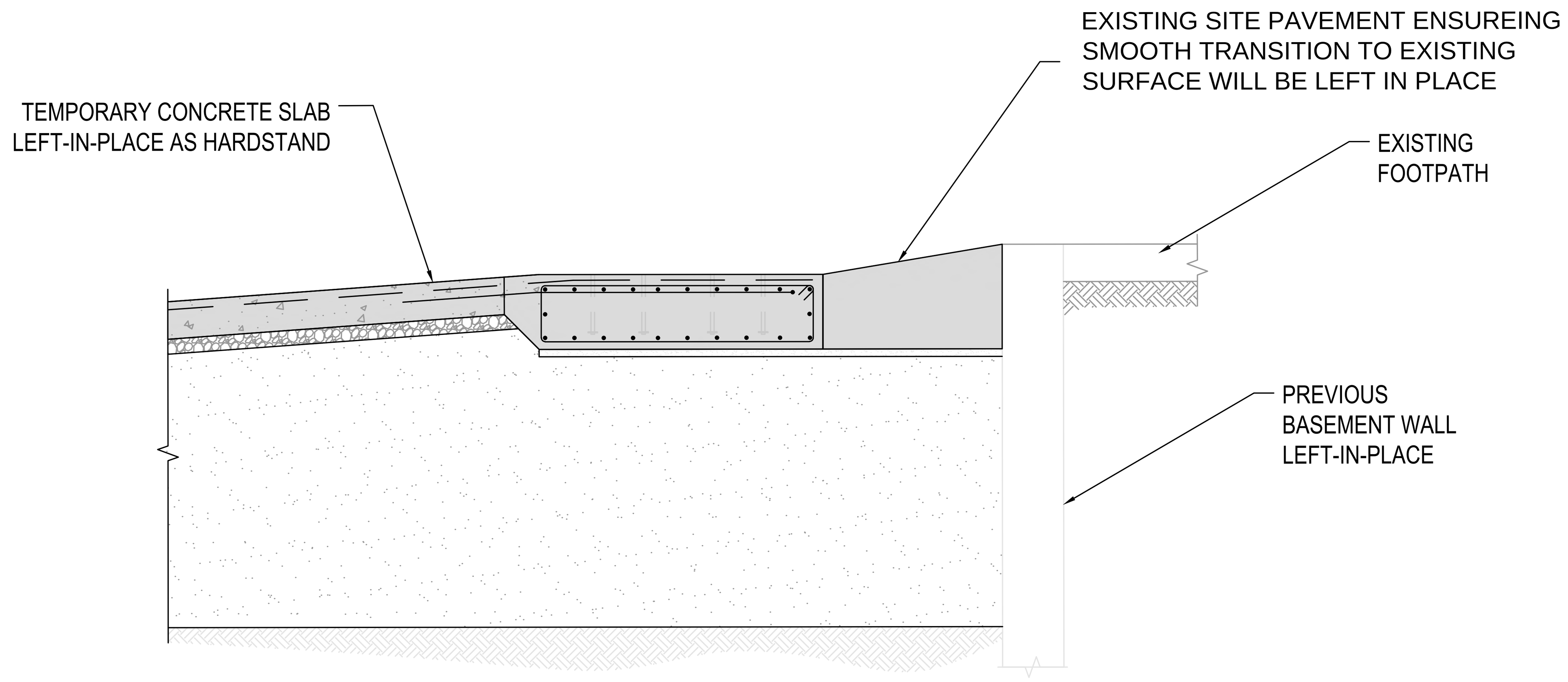

SECTION D/3050

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DESIGN MNGR	C.WAITE	31.03.22
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Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW- CIV -CW02-DRG- 3052

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES

SHEET 2 OF 6

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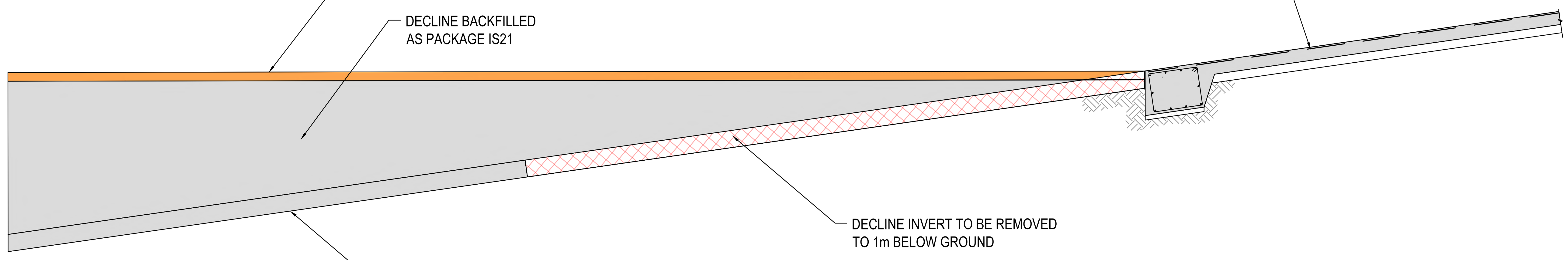
LEGEND

UNDER GROUND STRUCTURES TO BE REMOVED

PROPOSED NEW FLEXIBLE PAVEMENT HARDSTAND



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SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM	HEIGHT DATUM
MGA ZONE 56	AHD

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Sydney Motorway Corporation WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW- CIV -CW02-DRG-3053

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES

SHEET 3 OF 6

RMS REGISTRATION No.

PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
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LEGEND

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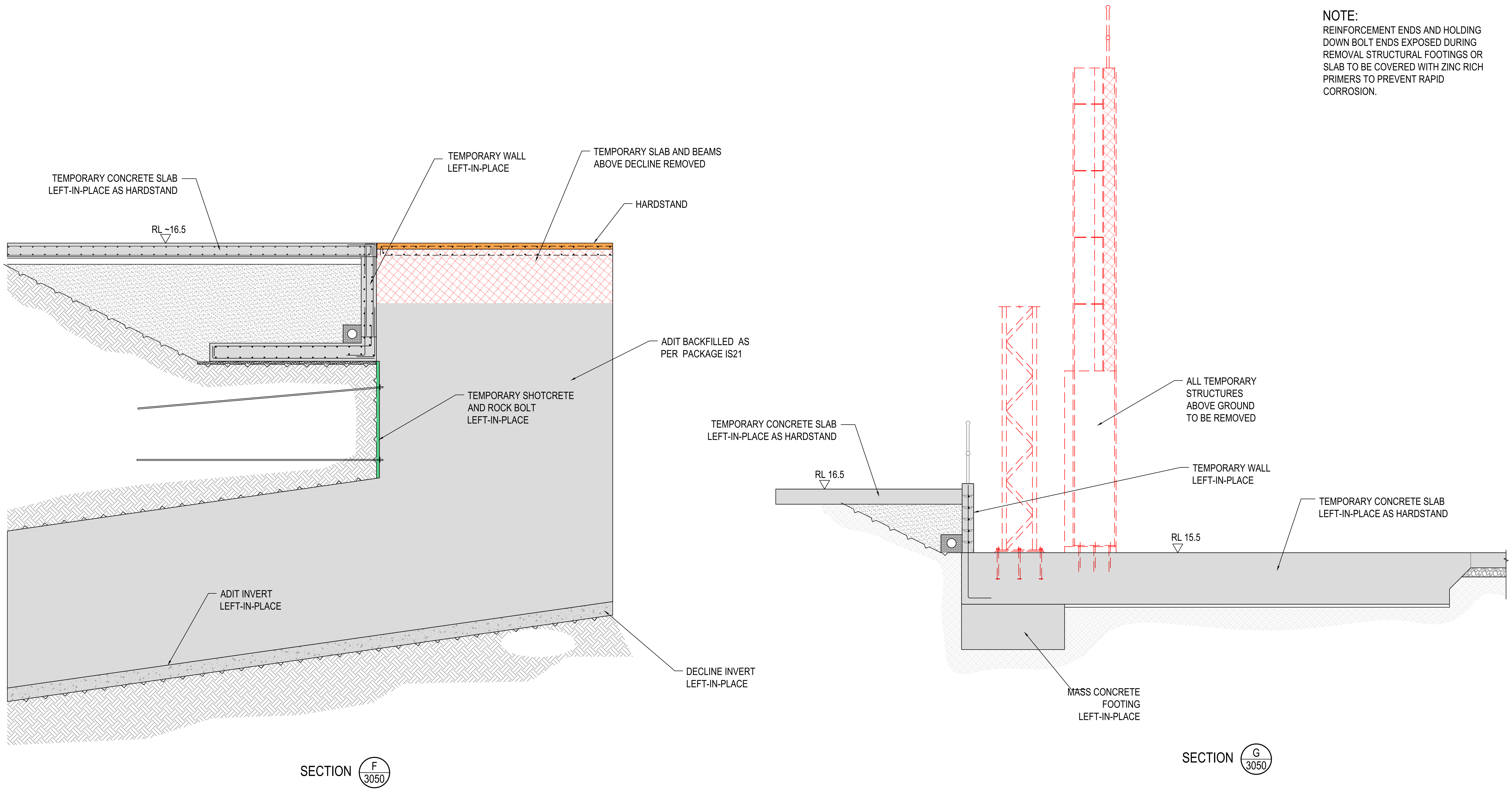

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PROJECT MNGR	C.WAITE	31.03.22

DOCUMENT NUMBER
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M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES

SHEET 4 OF 6

RMS REGISTRATION No.

PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
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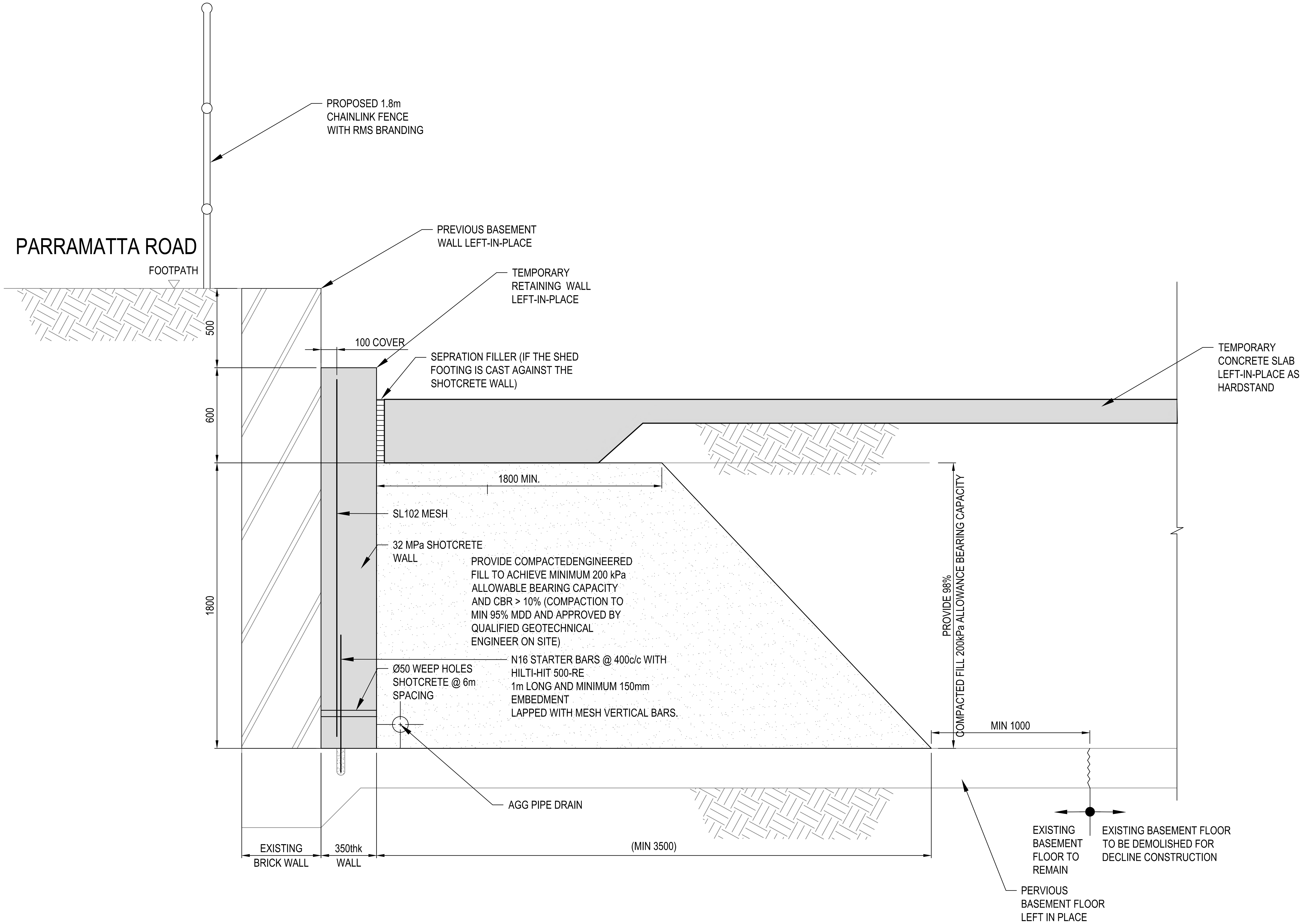
LEGEND

UNDER GROUND STRUCTURES TO BE REMOVED

PROPOSED NEW FLEXIBLE PAVEMENT HARDSTAND



RETAINING WALL TYPE 1

SECTION 1/3050

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PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW- CIV -CW02-DRG- 3055

M4-M5 LINK MAIN TUNNEL WORKS — A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES — SHEET 5 OF 6

RMS REGISTRATION No. — PART 1

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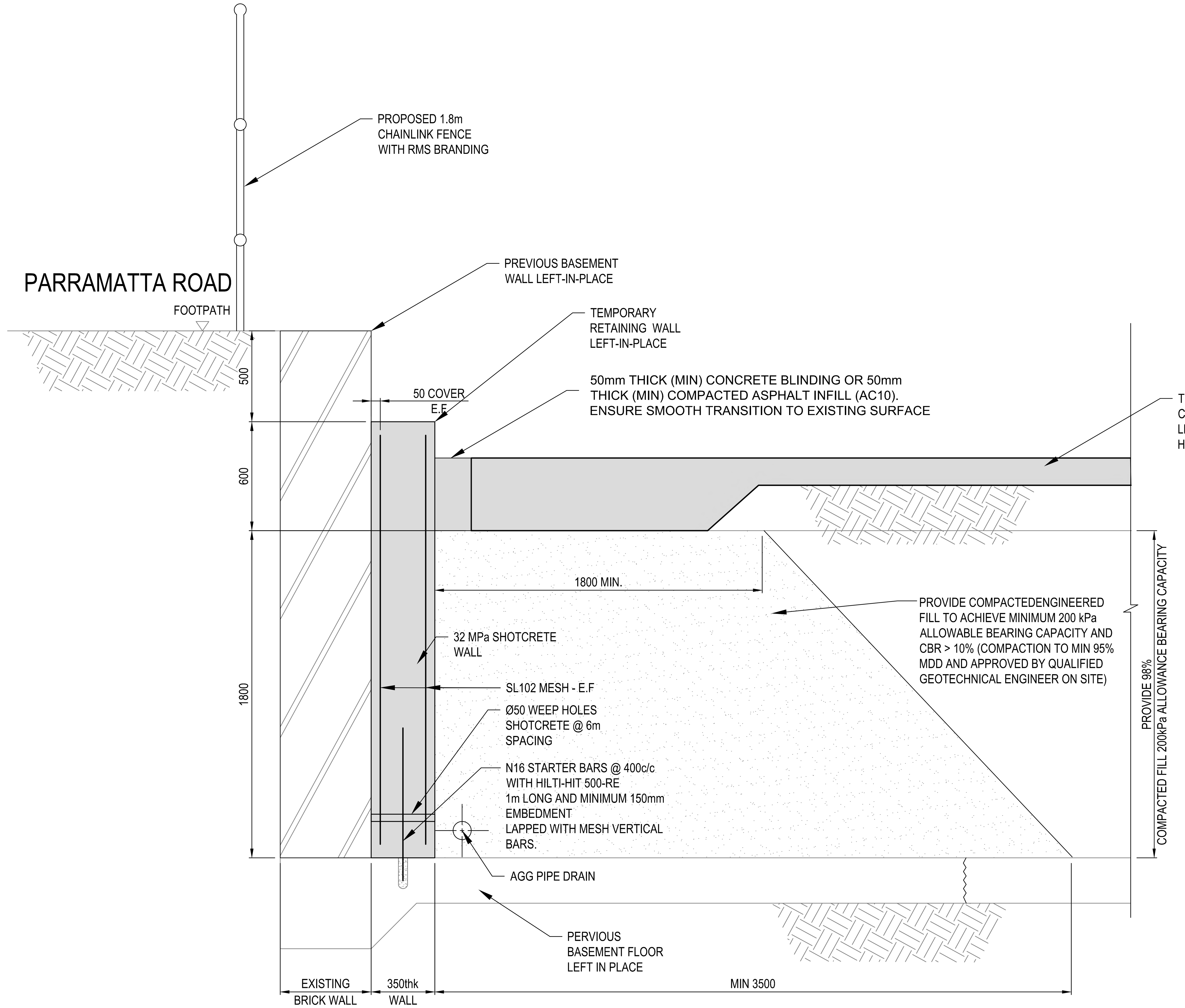
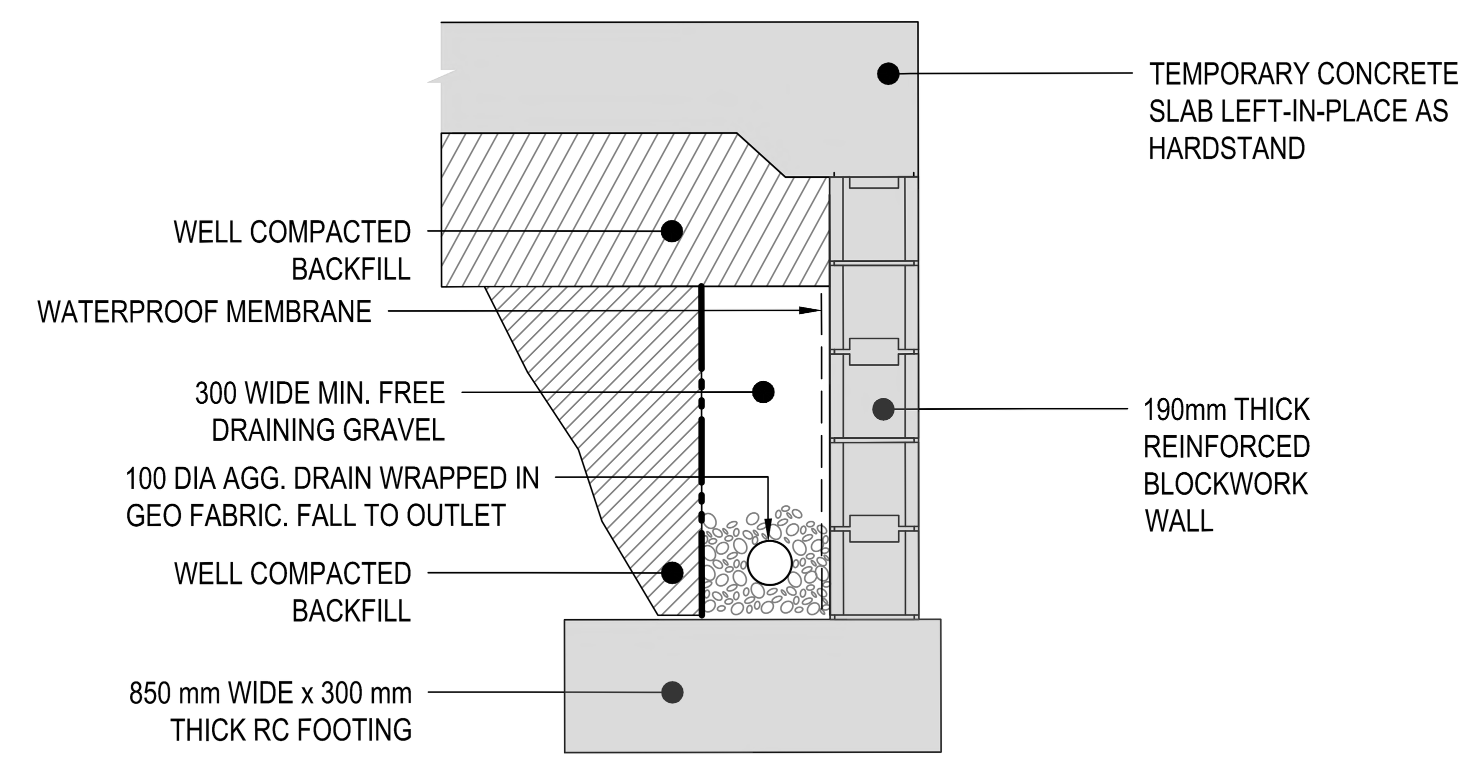


RETAINING WALL TYPE 2

SECTION 2/3050



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HEIGHT DATUM: AHD

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PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation
WestConnex

DOCUMENT NUMBER
M4M5-RBGP-PRW-CIV-CW02-DRG-3056

M4-M5 LINK MAIN TUNNEL WORKS

A3

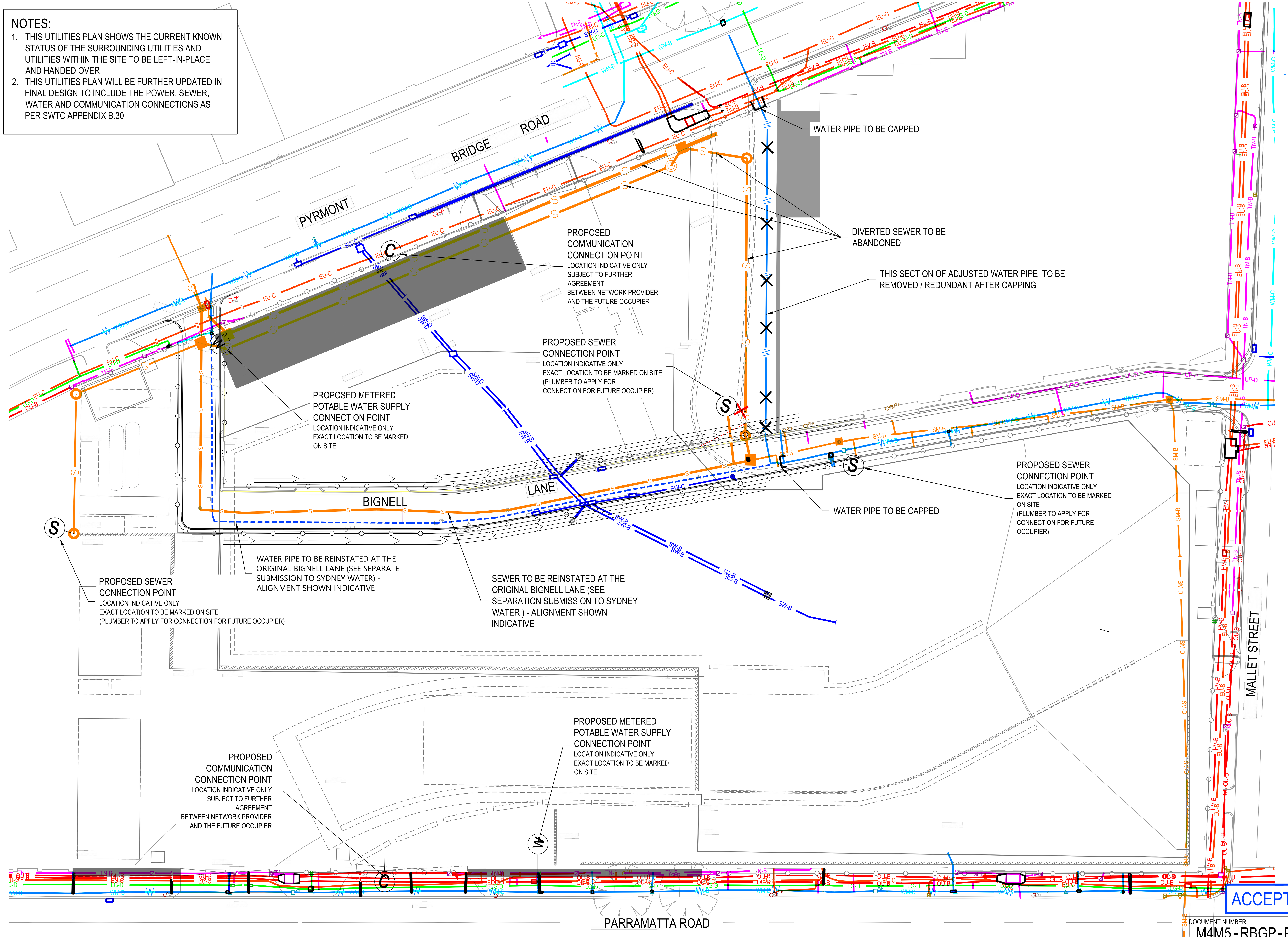
PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
TYPICAL SECTION - UNDERGROUND STRUCTURES
SHEET 6 OF 6

RMS REGISTRATION No.
PART 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
ISSUED FOR CONSTRUCTION	-	CW02-DRG-3056	00

NOTES:

1. THIS UTILITIES PLAN SHOWS THE CURRENT KNOWN STATUS OF THE SURROUNDING UTILITIES AND UTILITIES WITHIN THE SITE TO BE LEFT-IN-PLACE AND HANDED OVER.
2. THIS UTILITIES PLAN WILL BE FURTHER UPDATED IN FINAL DESIGN TO INCLUDE THE POWER, SEWER, WATER AND COMMUNICATION CONNECTIONS AS PER SWTC APPENDIX B.30.



LEGEND

UP—D	UNKNOWN
HV—B	AUSGRID
EU—B	ELECTRICAL
WM—B	WATER
LG—D	GAS
SW—B	STORMWATER
SM—B	SEWER
TN—B	TESLTRA
OU—B	OPTIC FIBRE
RMS—B	RMS ELECTRICAL
S	SEWER - DIVERTED
W	WATER - ADJUSTED

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SCALES ON THIS A3 SIZE DRAWING

CO-ORDINATE SYSTEM: MGA ZONE 56

HEIGHT DATUM: AHD

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PROJECT MNGR	C.WAITE	31.03.22

Sydney Motorway Corporation — WestConnex

DOCUMENT NUMBER: M4M5-RBGP-PRW- CIV -CW02-DRG-3060

M4-M5 LINK MAIN TUNNEL WORKS

A3

PROJECT WIDE
CONSTRUCTION SITE REINSTATEMENT
PYRMONT BRIDGE
UTILITIES PLAN

SHEET 1 OF 1

RMS REGISTRATION No.

PART: 1

ISSUE STATUS	EDMS No.	SHEET No.	REV
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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

Lendlease Samsung Bouygues Joint Venture
WestConnex M4-M5 Link Tunnels
Level 7, 189 O'Riordan Street
PO Box 63
MASCOT NSW 1460

Attention: [redacted] - Senior Environmental Coordinator
[redacted]

15/10/2018

IS&A_181015_Interim advice#10
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #10 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (4/10/18) PSI FOR 79 PYRMONT BRIDGE ROAD ANNANDALE, WESTCONNEX STAGE 3A PROJECT (5 pages)

1. Introduction

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a draft Preliminary site investigation (PSI) report prepared by SESL Australia ('SESL') for the site at 79 Pyrmont Bridge Road, Annandale (hereafter referred to as the 'Annandale site'). The SESL document was dated 4/10/18.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the Annandale site towards the end of the WestConnex Stage 3A Project.

2. Review Comments on SESL PSI

The Site Auditor considers that the SESL PSI for the Annandale site is capable of meeting NSW EPA guidance and requirements provided the following review comments are addressed by an up-dated version of the document:

1. Various editorial comments, as indicated in a marked-up version of the SESL PSI attached to this letter.
2. The font in the report varies between Helvetica 10.5 and 10. The report needs to use a consistent size font.
3. The report refers to the ANZECC & ARMCANZ (2000) fresh and marine water quality guidelines. These have recently been replaced by the ANZ Water Quality guidance for fresh and marine waters available online at http://waterquality.gov.au/anz-guidelines ;
4. Amend executive summary in light of review comments raised below.
5. The draft report at several places mentions that it was prepared 'in consideration' of or 'with reference to' NSW EPA-approved guidance. I would prefer the report state that it was prepared in accordance with NSW EPA-approved guidance or if it wasn't, to identify those aspects that deviated from NSW EPA-approved guidance and provide justification for any such deviation.
6. **Section 2.2 Objectives**: Include additional objectives for a PSI specified in NSW EPA (2011) and SEPP 55 guidelines. These objectives are:

a) Identify all past and present potentially contaminating activities;

b) Identify potential contamination types;

c) Discuss the site condition;

d) Provide a preliminary assessment of site contamination;

e) Assess the need for further investigations.

7. **Section 3.3 Site Layout and Infrastructure**:

   a) Make reference to the results of the Hazardous Chemicals search documented in Section 5.7, where further details on USTs at the site are provided; and

   b) Conduct a DBYD search for buried services at the site and include the results in the PSI.

8. **Section 4.1 Topography and Drainage**: Advise the waterway that receives stormwater discharged from the site.

9. **Section 4.2 Geology and Soil**:

   a) Review geotechnical investigation reports available for the site and provide summary information. List any such reports in the Section 10 References;

   b) This section should summarise the information provided in Appendix A (pdf page 149), that the site is located on Ashfield Shale within the Wianamatta Group, which is probably overlain by natural clayey soil then fill; and

   c) Include the information from Section 6.5 in this section of the report.

10. **Section 4.3 Hydrogeology**:

    a) What types of shallow aquifers are likely to be present at the site (e.g. perched in fill, then bedrock fracture-controlled)?

    b) What is the expected depth to groundwater and the direction of groundwater flow at the site? (maybe to the north-west towards the former alignment of Johnstons Creek and in the dip direction of surface topography?)

    c) What waterbody is likely to receive groundwater that flows from the site? (e.g. Rozelle Bay?)

11. **Section 5.1 Historical Aerial Photographs**:

    a) The 1930, 1943 and 1949 aerial photos show that practically the entire local area was industrial;

    b) Examine the aerial photos and advise when the service station was first established at 198 Parramatta Road, Annandale (between 1955 and 1961?).

12. **New Section 5.3 Council Records**: Examine available Council records on the site. These records may contain among other things historic layout plans for the site, development applications, purpose of the furnace and chimney, and whether the site has suffered from fire damage.

13. **New Section 5.4 Historic Manufacturing Processes**: Use all the available historic data to describe the likely manufacturing processes that were likely to have been undertaken over the entire industrial history of the site and nearby land.

14. **New Section 5.5 Interviews with Site Personnel**: Summarise the data provided from interviews with present or past workers at the site. If interviews were not possible, explain why this was the case and assess the significance of this data gap.

15. **Section 5.5.4 EPA PFAS Investigation Program**: Assess the risk of PFAS contamination at the site based on the available historical and site condition data.

16. **Section 5.7 Hazardous Chemicals Search**: The results of a Safework NSW hazardous chemicals search should be conducted and the results documented in the PSI.
17. **New Section 5.9 Pollution from Off-site Sources**: Include a new section that assesses the potential for the site to be contaminated from pollution that has migrated onto the site from nearby industrial properties. Examples include:
    a) Watson Crane, metal platers and Pearce Bros Motor Engineers located on the western side of the site;
    b) The service station at 198 Parramatta Road, Annandale; and
    c) Grace Bros Garage and Bedford Trucks Sales and Service that were located on the eastern side of the site.
18. **Section 6 Site Reconnaissance**:
    a) Describe the structures that remain at the site. How old are the structures?. What are the exterior walls, building frame and roof made from? Is the entire ground surface across the site covered by concrete ground slabs or other? Describe any unsealed areas; Describe the location, size and design of any retaining walls at the site; Provide details of any basement or below ground structures; Are there painted surfaces in the building? What is the condition of the paintwork?
    b) Does the site currently have an asbestos register?
    c) Given all these factors, assess the risk that the structure contains hazardous building materials?
    d) Provide a new figure that provides the current layout of the large industrial building that covers the site. The figure should also show the brick furnace and chimney, the UST identified by the site inspection, other USTs identified by the Safework NSW search, the fuel bowser, buried services, etc.
19. **Section 6.2 Chemical Use and Storage**: Advise if any waste materials, drums, etc were identified by the site inspection.
20. **Section 6.5 Cut and Fill**: Relocate the information to Section 4.2.
21. **Section 6.6 Potential Contamination**: Amend this section to address the following comments:
    a) Assess the potential for contamination from nearby properties to have migrated onto the site and impacted soils, groundwater and/or soil vapour;
    b) Assess the potential for shallow soil contamination at the site from the spraying of pesticides / herbicides; and
    c) Assess the potential for hazardous materials (e.g. asbestos, lead, PCBs, wastes) to be present in buried services and building materials that pose a contamination risk when construction work for WestConnex is undertaken at the site.
22. **Section 7 Relevant Guidelines for Contamination Assessment and Management**: Amend and update this section to reflect current NSW EPA guidance.
23. **Section 7.2 NEPM:**
    a) Include aesthetic considerations as specified in Section 3.6 of NEPM (2013) Schedule B1 and Section 4.2.6 of the NSW EPA (2017) site Auditor Guidelines;
    b) Mention that EIL D criteria may need to be considered if unsealed, landscaped areas are to be included in the final landscape plan for the site following the completion of construction activities;

c) Advise whether there is a possibility that part of the final land use for the site may include public open space, in which case Recreational C criteria would need to be considered; and

d) This section should also mention the use of the Null Hypothesis described in Section 18.3 of the NEPM (2013) Schedule B2 guidelines, which means that a site should be considered to be contaminated unless data shows that it isn't to a high level of confidence.

24. **New Section 7.3 NSW EPA (2017) Site Auditor Guidance:** Summarise the NSW EPA requirements for the assessment of site contamination given in Section 4.2 of the NSW EPA (2017) Site Auditor Guidelines.

25. **Section 7.4 Relevant Legislation**: This section is a repeat of Section 2.3 and should be removed and consolidated into the earlier section.

26. **Section 8.1 Sources of Impacts**: The CSM should include 3 additional AECs, these being:

    a) AEC 7: Potential soil, groundwater and/or soil vapour contamination from the 7-Eleven (former Mobil) Annandale Service Station at 198 Parramatta Road, Annandale, which was reported to the NSW EPA;

    b) AEC 8: Potential shallow soil contamination from the spraying of pesticides / herbicides; and

    c) AEC 9: Buried services and hazardous building materials.

27. **Section 8.2 Potential Contaminants of Concern**:

    a) Include additional analytes as recommended in the marked-up copy of the draft report; and

    b) Remove PFAS as a potential contaminant of concern based on the assessment to be provided in Section 5.5.4.

28. **Section 8.5 Data Gaps:**

    a) The report refers to the investigation having been based on a number of assumptions. Specify these assumptions and explain why they were made;

    b) Include the results of the SafeWork NSW Hazardous Chemicals search so that this data gap can be removed;

    c) An additional data gap is the type and extent of hazardous building materials at the site;

    d) An additional data gap is the presence of off-site sources of contamination impacting the site;

    e) An additional data gap is the depth and extent of fill material at the site;

    f) An additional data gap is the type and extent of soil, groundwater and soil vapour contamination at the site; and

    g) An additional data gap is the type and extent of contamination migrating from the site, if present.

29. **Section 9.1 Site Characterisation**: Amend this section to address earlier review comments.

30. **Figure1 Site Locality**: Show the site location more clearly.

31. **Figure 2 Site Layout**: Rename figure '*Recent aerial photo of site'*

32. **New Figure 3**: Provide a figure showing the location of the site relative to surface water bodies, environmental receptors and the 7-Eleven service station site.

33. **New Figure 4**: Provide a figure showing the detailed layout of the site, the brick furnace and chimney, the UST identified by the site inspection, other USTs identified by the Safework NSW search, the fuel bowser, buried services, etc.

IAN SWANE & ASSOCIATES P/L

O – O - O

I trust the review comments made herein are self-explanatory and agreeable to the LSB_JV and Epic. In the event that any of the review comments need to be discussed, please don't hesitate to contact me.

Please advise me when the revised SESL PSI for the Annandale site is likely to be issued so I can plan its review and approval.

Yours sincerely

Ian C Swane

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Attachments:

1. Marked-up copy of SESL (4/10/18) PSI (39 pages)

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Attention: [redacted] - Senior Environmental Coordinator

[redacted]

16/10/2018

IS&A_181016_Interim advice#11
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #11 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (28/09/18) SAQP FOR 79 PYRMONT BRIDGE ROAD ANNANDALE, WESTCONNEX STAGE 3A PROJECT (3 pages)

1. Introduction

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a draft Sampling Analysis and Quality Plan (SAQP) prepared by SESL Australia ('SESL') for the site at 79 Pyrmont Bridge Road, Annandale (hereafter referred to as the 'Annandale site'). The SESL document was dated 28/09/18.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the Annandale site towards the end of the WestConnex Stage 3A Project.

2. Review Comments on SESL SAQP

The Site Auditor considers that the SESL SAQP for the Annandale site is capable of meeting NSW EPA guidance and requirements provided the following review comments are addressed by an up-dated version of the document:

1. Various editorial comments, as indicated in a marked-up version of the SESL PSI attached to this letter.
2. The font in the report varies between Helvetica 10.5 and 10. The report needs to use a consistent size font.
3. **Section 1 Introduction and Background**:
   a) Three additional AECs should be included, these being:
      - AEC 7: Potential soil, groundwater and/or soil vapour contamination from the 7-Eleven (former Mobil) Annandale Service Station at 198 Parramatta Road, Annandale, which was reported to the NSW EPA;
      - AEC 8: Potential shallow soil contamination from the spraying of pesticides / herbicides; and
      - AEC 9: Buried services and hazardous building materials.

b) Expand the objectives of the SAQP to include those specified in Section 5.2 of the NEPM (2013) Schedule B2 guidelines.

c) Any variation to the SAQP should be discussed with the Site Auditor as they may arise.

d) Include the results of the SafeWork NSW Hazardous Chemicals search in the PSI and adjust the SAQP accordingly.

4. **Section 2 Investigation Objective**: The purpose of the DSI needs to reflect the objectives of a DSI given in the NSW EPA (2011) guidelines. Suggested amendments made in marked-up document.

5. **Section 3 Scope of Work**: Expand the scope of work to include all the main tasks required by the DSI.

6. **Section 4.2 Step 2 – Identify the Decision / Goal of the Study**: Add additional decisions such as those included in the marked-up version.

7. **Section 4.3 Step 3 – Identify Information Inputs**: Add additional inputs such as those included in the marked-up version.

8. **Section 4.4 Step 4 – Define the Study Boundaries**: Change the depth boundary to:

   a) At least the full depth of fill and soil at the site and the shallow groundwater aquifer, whichever is deeper, but not less than 4 m below ground surface for soil and groundwater; and

   b) The depth of the concrete slab for soil vapour unless groundwater is found to be deep and contaminated by VOCs, in which case soil vapour would need to be assessed down to the excavation depth required by the WestConnex project.

9. **Section 4.7 Step 7: Optimise the Design for Obtaining Data**: The SAQP should include additional approaches for optimisation of the investigation design. These include:

   a) The program has been developed to meet the objectives detailed in Section 2;

   b) The schedule of work will be optimised through parallel delivery of tasks, real-time decision making and good communication between SESL, LSBJV and the Site Auditor;

   c) Targeting potential sources and migration paths for contamination; and

   d) Adopting sample depths where soils have the highest likelihood of being impacted.

10. **Section 5.1 Sampling Locations**: For soil vapour, advise that:

    a) One of the sub-slab vapour pins should be located above the UST, with other pins located above fuel lines and bowsers; and

    b) Advise that additional deeper soil vapour probes may be required if groundwater is found to be deep and contaminated by VOCs.

11. **Section 5.2.3 Intrusive Investigation**:

    a) Deeper boreholes will need to be drilled where the depth to bedrock exceeds 4 mbgs in order that the entire fill and soil layers can be characterised; and

    b) If shallow groundwater is not encountered above bedrock, then the borehole for groundwater monitoring will need to be extended by a rock roller bit to a depth that will allow representative groundwater samples to be collected.

12. **Section 5.2.6 Groundwater Monitoring Well Installation**: The bentonite seal must have a thickness of not less than 1.0m , as recommended by Section 3.5.4.1 in EA (2006) and required by Section 8.2.3.3, NEPM (2013) Schedule B2.

13. **Section 6.1 Sample Analysis Schedule**:

a) The PSI needs to assess whether PFAS is a PCOC for the site. If there is a low risk of an on-site PFAS source, then consideration should be given to dripping PFAS for the suite of analytes;

b) Include chlorinated solvents in the VOC scan.

14. **Section 6.3 Environmental Assessment Criteria**:

a) The SAQP should advise that risks to aquatic receptors will be assessed using ANZG (August 2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality available online at http://waterquality.gov.au/anz-guidelines ;

b) The SAQP should advise that risks to human health will be assessed using the ADWG (August 2018) Australian Drinking Water Guidelines;

c) The SAQP should advise that human health risks posed by soil vapours will be assessed using the vapour criteria given in the NEPM (2013) guidelines and for analytes not available other criteria will be used such as the WHO Ambient Air Guidelines, WHO Environmental Health Criteria, USEPA Regional Screening Levels; USEPA IRIS Database and Ontario Air Criteria.

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I trust the review comments made herein are self-explanatory and agreeable to the LSB_JV and SESL. In the event that any of the review comments need to be discussed, please don't hesitate to contact me.

Please advise me when the revised SESL SAQP for the Annandale site is likely to be issued so I can plan its review and approval.

Yours sincerely

Ian C Swane

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Attachments:

1. Marked-up copy of SESL (28/09/18) SAQP (23 pages)

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Attention: [redacted] - Senior Environmental Coordinator
[redacted]

26/11/2018

IS&A_181126_Interim advice#19
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #19 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
BASIS FOR SITE AUDIT WORK ON WESTCONNEX STAGE 3A PROJECT

1. Introduction

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project (the 'Project').

The purpose of this interim advice is to document the Site Auditor's understanding of the basis for site audit work to be undertaken for the LSB_JV on the Project and the outcomes that the site audit work will need to achieve. This advice should assist the identification of the site audit matters that the LSB_JV will need to meet under their contract with the NSW Government, and identify other site audit matters that may need to be met separately by the NSW Government.

The Site Auditor considers this interim advice is required at this early stage of the Project because statutory site audits can have different objectives, as indicated by the range of options given on the NSW EPA site audit statement proforma, with the objectives required by the LSB_JV being possibly different from those of the NSW Government. The advice provided herein is also limited to site contamination issues and does address any planning or legal matters, which are outside the expertise of the Site Auditor.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared towards the end of the Project for each part of the Project site where the ground surface is disturbed by construction work undertaken by the LSB_JV.

2. Assumptions

The following assumptions have been made for the purpose of this interim advice and site audit work to be undertaken for the LSB_JV:

1. The Department of Planning issued Planning Consent SSI 7485 for the Project on 17/04/18 ('Planning Consent'). The proponent for the Project is Roads and Maritime Services (RMS) from the NSW Government.
2. On or about June 2018, the LSB_JV was awarded a contract with the NSW Government to deliver most of the work required by the Project as described in the Planning Consent. Some work required by the Planning Consent may be outside the scope of work to be undertaken by the LSB_JV.

3. With regards to site contamination, the LSB_JV is understood to be responsible for:
   a) Complying with NSW Government environmental legislation regarding contaminated site and waste management;
   b) Managing contamination it interferes or disturbs during the course of carrying out its work;
   c) Not generating contamination at the Project site or generating contamination that may cause an increase in contamination migrating from the Project site; and
   d) Complying with Environmental Protection Licence 21149.
4. With regards to site contamination, the LSB_JV is understood NOT to be responsible for engaging the Site Auditor to determine whether:
   a) Any part of the Project site has been remediated and is suitable for a specified use other than as a road construction worksite; and
   b) Contamination that existed at the Project site prior to the commencement of the Project continues to migrate off-site.
5. The Site Auditor engaged by the LSB_JV is understood to be responsible for:
   a) Reviewing site environmental management plans that deal with contamination at the Project site and whether these plans meet Condition C22 of the Planning Consent.
   b) Reviewing contamination assessments for the Project site and whether they meet Condition E181 of the Planning Consent.
   c) Reviewing waste classifications and documentation on the management of waste removed from the Project site[1].
   d) Reviewing reports on the management of contamination at the Project site throughout the period construction activities are undertaken by the LSB_JV and to determine whether:
      i. No additional contamination was generated by the construction work;
      ii. The land was maintained in a condition suitable for a road construction worksite and compliance was achieved with Conditions E182 to E185 of the Planning Consent;
      iii. Waste generated by construction activities at the Project site was managed in accordance with NSW EPA guidance and Conditions E202 to E204 of the Planning Consent; and
      iv. The requirements of Conditions O5.10 and O5.11 of EPL 21149 were met.
   e) Notifying the LSB_JV, RMS and the NSW EPA if the Site Auditor concludes that a part of the Project site should be notified to the EPA under the CLM Act[2].
   f) Issuing a Section A1 SAS for each part of the Project site where the ground surface is disturbed by construction work undertaken by the LSB_JV. Each SAS is to be issued at the completion of LSB_JV sitework and needs to determine whether the land is suitable for a road construction worksite at the end of construction period and prior to landscaping by RMS. Each SAS also needs to determine whether:
      i. The site auditor reviewed site environmental management plans that dealt with contamination at the site and considered the plans met Condition C22 of the Planning Consent;

[1] A requirement under Section 4.3.7, NSW EPA (October 2017) Site Auditor Guidelines
[2] A requirement under Sections 3.8.2, 4.3.11 & 4.3.12, NSW EPA (October 2017) Site Auditor Guidelines

ii. The site auditor reviewed contamination assessments for the site and considered they met Condition E181 of the Planning Consent;

iii. The site auditor reviewed reports on the management of contamination at the site throughout construction and considered that:

- No additional contamination was generated by the construction work,
- The land was maintained in a condition suitable for a road construction worksite and compliance was achieved with Conditions E182 to E185 of the Planning Consent;
- Waste generated by construction activities at the site was managed in accordance with NSW EPA guidance and Conditions E202 to E204 of the Planning Consent; and
- The requirements of Conditions O5.10 and O5.11 of EPL 21149 were met.

6. With regards to site contamination, the NSW Government is responsible for engaging the Site Auditor to:

   a) Determine whether land within the Project site is suitable for a specified use other than as a road construction worksite at the end of construction and prior to landscaping by RMS;

   b) Review documentation prepared by environmental consultants that determines whether contamination migrating from the Project site is posing an unacceptable risk to off-site receptors and needs to be remediated; and

   c) Review work undertaken at the Project site in addition to that required by the NSW EPA under Conditions O5.10 and O5.11 of EPL 21149.

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The Site Auditor requests that the LSB_JV confirms that the assumptions made in this interim advice letter are correct and that the assumptions form the basis for the site audit work to be undertaken for the LSB_JV and the outcomes that the site audit work need to achieve.

Yours sincerely

Dr Ian C Swane (CPEng & CEnvP)
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Attention: [redacted] - Senior Environmental Coordinator
[redacted]

20/12/2018

IS&A_181220_Interim advice#20
2018_WestConnexStage 3A

Dear [redacted]

**INTERIM ADVICE #20 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (26/11/18) SAQP FOR WESTCONNEX PYRMONT BRIDGE ROAD SITE, ANNANDALE, WESTCONNEX STAGE 3A PROJECT**

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a revised draft Sampling Analysis and Quality Plan (SAQP) prepared by SESL Australia ('SESL') for the WestConnex site at Pyrmont Bridge Road, Annandale (hereafter referred to as the 'PBR site'). The SESL document was dated 26/11/18 and supersedes an earlier version dated 28/09/18[1].

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the Annandale site towards the end of the WestConnex Stage 3A Project.

The Site Auditor considers that the revised draft SAQP for the PBR site dated 26/11/18 has addressed all review comments made by the Site Auditor in his 16/10/18 report, is consistent with NSW EPA guidance, and is suitable for use by the WestConnex Stage 3A Project. Two minor typographic errors were found that are not considered to be significant but SESL may wish to address them in the final version of the SAQP[2]. The Site Auditor requests that the LSB_JV provides the Site Auditor with a soft copy of the final version of the SAQP prior to the commencing the DSI.

Yours sincerely

Ian C Swane

Dr Ian C Swane (CPEng & CEnvP)
EPA Site Auditor NSW, WA & NT
Director, Ian Swane & Associates
Phone: 0418 867 112; Email: iswane@bigpond.com

[1] The earlier version of the SAQP was reviewed by the Site Auditor on 16/10/18, with the results of the review documented in Interim Advice Report #11

[2] On page 3 'Abbreviations', begin a new line for NATA; On page 7 'Section 3 Scope of Work', in the 10th dot point remove 'and' from the end of the line.

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Attention: [redacted] - Senior Environmental Coordinator
[redacted]

20/12/2018

IS&A_181220_Interim advice#21
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #21 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (16/11/18) PSI FOR WESTCONNEX PYRMONT BRIDGE ROAD SITE, ANNANDALE, WESTCONNEX STAGE 3A PROJECT

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a revised draft Preliminary Site Investigation (PSI) report prepared by SESL Australia ('SESL') for the WestConnex site at Pyrmont Bridge Road, Annandale (hereafter referred to as the 'PBR site'). The SESL document was dated 16/11/18 and supersedes an earlier version dated 4/10/18[1].

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the PBR site towards the end of the WestConnex Stage 3A Project.

The Site Auditor considers that the revised draft PSI for the PBR site dated 16/11/18 has addressed all review comments made by the Site Auditor in his 15/10/18 report, is consistent with NSW EPA guidance, and is suitable for use by the WestConnex Stage 3A Project. The Site Auditor requests that the LSB_JV provides the Site Auditor with a soft copy of the final version of the PSI prior to commencing the DSI.

Yours sincerely

Dr Ian C Swane (CPEng & CEnvP)
EPA Site Auditor NSW, WA & NT
Director, Ian Swane & Associates

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[1] The earlier version of the PSI was reviewed by the Site Auditor on 15/10/18, with the results of the review documented in Interim Advice Report #10

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Attention: [redacted] - Senior Environmental Coordinator
[redacted]

29/01/2019

SA278_190129_Interim advice#22
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #22 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE REVIEW OF LSB_JV (24/01/19) SAQP FOR WESTCONNEX PYRMONT BRIDGE ROAD SITE, ANNANDALE, WESTCONNEX STAGE 3A PROJECT

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a final version of a Sampling Analysis and Quality Plan (SAQP) prepared by the LSB_JV for the WestConnex Pyrmont Bridge Road (PBR) Annandale site (hereafter referred to as the 'PBR site'). The document was dated 24/01/19 and supersedes an earlier version prepared by SESL dated 26/11/18[1].

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the PBR site towards the end of the WestConnex Stage 3A Project.

The Site Auditor considers the final version of the SAQP for the PBR site dated 24/01/19 has addressed all review comments made by the Site Auditor in earlier interim advice reports, is consistent with NSW EPA guidance, and is suitable for use by the WestConnex Stage 3A Project.

Yours sincerely

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[1] The previous version of the SAQP was reviewed by the Site Auditor on 20/12/18, with the results of the review documented in Interim Advice Report #20

Ian Swane

From: Ian Swane <iswane@bigpond.com>
Sent: Friday, 22 February 2019 3:47 PM
To: [redacted]
Cc: [redacted]
Subject: Site Auditor Review of PSI for Stage 2 PBR Site - Site Audit 278
Attachments: SA278_190222_PBR PSI (SA review).doc

[redacted]

Please find attached a tracked change copy of the draft report. Only minor changes are considered necessary. The Table 3 edits are based on information provided by the Six Maps website.

Please arrange for SESL to finalise the report and then for LSBJV to send me a final copy for my approval.

Many thanks
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor NSW, WA, NT
Ian Swane & Associates (mob: 0418 867 112)

From: [redacted]
Sent: Monday, 18 February 2019 3:27 PM
To: Ian Swane <iswane@bigpond.com>
Subject: PBR PSI (for the majority of the site)

Hi Ian,

Hope the job that was impacting on your availability has passed and it went well. Just wondering if you would have an update of timing for completion of the review of the SESL PSI for Property 1-8 (all Other sites) – SESL Doc number: J001309; date: 30/10/18; File name: J001309 PSI Stage 2 PBR Site 0.6.doc?

Regards

[redacted]
Senior Environmental Coordinator

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Attention: [redacted] - Environmental Manager
[redacted]

14/03/2019

IS&A_190314_Interim advice#29
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #29 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (12/03/19) PSI STAGE 2 PYRMONT BRIDGE ROAD SITE, ANNANDALE, WESTCONNEX STAGE 3A PROJECT

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a final version of a Preliminary Site Investigation (PSI) report prepared by SESL Australia ('SESL') for the Stage 2 Pyrmont Bridge Road Site at Annandale (hereafter referred to as the 'Stage 2 PBR site'). The SESL document was dated 12/03/19 and supersedes earlier versions dated 30/10/18 and 18/02/19[1].

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the Stage 2 PBR site towards the end of the WestConnex Stage 3A Project.

The Site Auditor considers that the final version of the PSI for the Stage 2 PBR site dated 12/03/19 has addressed all review comments made by the Site Auditor, is consistent with NSW EPA guidance, and is suitable for use by the WestConnex Stage 3A Project.

Yours sincerely

Ian C Swane

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[1] The earlier version of the PSI was reviewed by the Site Auditor on 30/10/18, with the results of the review documented in Interim Advice Report #24. A few typos were then identified in a revised version sent to the Site Auditor on 18/02/19, which were identified in a tracked-change version issued by the Site Auditor on 22/02/19.

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Lendlease Samsung Bouygues Joint Venture
WestConnex M4-M5 Link Tunnels
Level 7, 189 O'Riordan Street
PO Box 63, MASCOT NSW 1460

Attention: [redacted] - Environmental Manager
[redacted]

4/04/2019

SA278_190404_Interim advice#30
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #30 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF SESL (25/03/19) DRAFT DSI FOR 79 PYRMONT BRIDGE ROAD, WESTCONNEX STAGE 3A PROJECT (4 pages)

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a draft version of the SESL (25/03/19) Detailed Site Investigation (DSI) report for 79 Pyrmont Bridge Road, which represents Property 9 in the suite of properties that make up the Pyrmont Bridge Road (PBR) construction site.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the SPI site towards the end of the WestConnex Stage 3A Project.

This review is based on compliance with an SAQP prepared by SESL for all nine PBR properties. A revised draft SAQP was issued by SESL dated 26/11/18. This document was then reviewed and approved by the Site Auditor in Interim Advice Report #20 dated 20/12/18 pending the release of a final version. An updated draft version was subsequently issued by SESL dated 8/01/19, which is the most recent SAQP that covers Property 9 and has been provided to the Site Auditor.

The Site Auditor has reviewed the draft report and attaches a tracked-change version that provides comments in the former of edits. Other review comments that need to be addressed in a revised DSI report are:

1. **Executive Summary**: Revise to accommodate changes / additional information as recommended in this review.
2. **Section 7.2.2 HSLs Petroleum Hydrocarbon Compounds**: Include the Management Limits for TPH fractions F1-F4 in soil for Commercial / Industrial land use specified in Table 1 B(7) in the NEPM (2013) Schedule B(1) guideline
3. **Section 8 SAQP:**
   a) I assume that the DSI was based on the SESL (8/01/19) SAQP, since it is a later version to the one that was reviewed by the Site Auditor and documented in Interim Advice Report #20 dated 20/12/18. It is also the most recent version that includes Property 9. If the DSI has been based on a different SAQP then please explain why this occurred.
   b) Ensure that a complete copy of the SAQP used by the DSI is included in Appendix B.

c) The SAQP[1] required boreholes for groundwater monitoring wells to be drilled into the sandstone bedrock by downhole hammer (or similar) to a depth that will allow representative groundwater samples to be collected. I note that the DSI advised that groundwater wells could not be drilled into the sandstone bedrock because of the low ceiling height. The field investigation was undertaken in mid-October 2018 almost 6 months ago. The groundwater wells should have been drilled, constructed and sampled by now. The DSI report should include the results of the groundwater investigation or explain why it has not been possible to undertake and advise when this work will be undertaken.

d) Show the location of the suspected third UST on Figure 4.

4. **Section 10 Field Investigation**:

   a) Specify the diameters of the push tube and solid flight augers used.

   b) Assess the ability of the adopted drilling techniques to provide representative samples of fill containing bonded asbestos fragments and coarse gravel-size material.

   c) Given the coarse-grain size of some of the fill, describe how soil samples were collected and whether the samples were representative of a particular size and type of material. Assess the representativeness of samples that were collected and sent for laboratory testing.

   d) Provide a new figure that shows the fill thickness measured at each location and contours of estimated fill thickness across the site.

5. **Section 11.2 Soil**:

   a) Tables A1 and A2 containing assessment criteria were missing from the draft report;

   b) Provide a new figure that shows the locations of the fill samples that exceeded the HIL/HSL D criteria together with their analyte concentrations.

6. **Section 12.1 Results:**

   a) Assess the potential for petroleum hydrocarbon and/or solvent contamination to be present in the vicinity of the USTs.

   b) Assess the potential for contamination in the natural soils and bedrock at the site

   c) The weight of evidence (or lack thereof) does not support the conclusion that '*No hotspot is therefore suspected'*. In my opinion, there remains a significant risk that presently unknown hot-spots are present at the site. This is because:

      - No investigations have been undertaken near and under the three USTs at the site;
      - The DSI provided no data on the condition of the USTs and associated infrastructure and contents of the tanks;
      - Soil samples were collected using push tubes and solid stem augers, which are drilling techniques not capable of retrieving representative samples of fill containing bonded asbestos fragments and coarse-size gravel;
      - Soil samples were collected 12 boreholes, which provide very limited data to characterise uncontrolled fill from unknown sources. The area covered by the boreholes represent 0.004% of the site area; and
      - No boreholes were drilled, sampled and tested from potential sources of contamination at the site such as the furnace / chimney, and in the vicinity of buried services.

[1] Sections 5.2.3 & 5.2.6, SESL (8/01/19) SAQP

In my opinion, the DSI report should advise there remains a significant risk that presently unknown hotspots at the site.

d) What is the likely source of the TCE soil vapour contamination?

7. **Section 12.2 Waste Classification**:

   a) Assess whether different waste classifications for the fill apply to specific areas of the site.

   b) Assess whether sufficient data was collected by the DSI to allow the in-situ classification of fill at the site.

   c) If the recommendation is for additional data to be collected for waste classification purposes, the data that was collected by the DSI would still need to be included in the waste assessments.

8. **Section 12.3.1 AEC 1:** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

9. **Section 12.3.2 AEC 2:** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

10. **Section 12.3.3 AEC 3 (new section):** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

11. **Section 12.3.4 AEC 4 (new section):** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

12. **Section 12.3.5 AEC 5 to 8 (new section):** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

13. **Section 13.1 Sources of Impact:** Poor quality assessment. Suggested changes are provided on the marked-up copy of the DSI.

14. **Section 14 Conclusions**: Suggested changes are provided on the marked-up copy of the DSI.

15. **Figures:**

   a) Show the location of the suspected third UST on Figure 4.

   b) Provide a new figure that shows the fill thickness measured at each location and contours of estimated fill thickness across the site.

   c) Provide a new figure that shows the locations of the fill samples that exceeded the HIL/HSL D criteria together with their analyte concentrations.

16. **Appendices:**

   a) Provide a complete copy of the appendices – all were missing from the draft report;

   b) Appendix A – Ensure the borelogs are prepared in accordance with NSW EPA guidance and Australian standards. Ensure each log is checked for correctness and accuracy and signed-off by a senior consultant.

   c) Provide a new appendix that includes summary tables for the laboratory test results. Make sure that the tables are legible when printed on A3 page and ensure that the data provided in the tables are complete and correct by SESL performing a checkprint with the laboratory test certificates.

IAN SWANE & ASSOCIATES P/L

Yours sincerely

Dr Ian C Swane (CPEng & CEnvP)
EPA Site Auditor NSW, WA & NT
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Attachment: Marked-up version of draft DSI

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Lendlease Samsung Bouygues Joint Venture
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Attention: [redacted] - Environmental Manager
[redacted]

11/06/2019

SA278_190611_Interim advice#38
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #38 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE
REVIEW OF ALLIANCE (17/05/19) DRAFT STAGE 2 DSI FOR PYRMONT BRIDGE ROAD CONSTRUCTION SITE, WESTCONNEX STAGE 3A PROJECT (13 pages)

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

The purpose of this interim advice is to provide a review of a draft version of the Alliance Geotechnical (Alliance) Stage 2 Detailed Site Investigation (DSI) report for the Pyrmont Bridge Road (PBR) construction site. The report was dated 17/05/19 and a copy was provided to the Site Auditor on 20/05/19.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the PBR construction site towards the end of the WestConnex Stage 3A Project.

This review is based on compliance with an SAQP prepared by the LSB_JV for all nine PBR properties dated 24/01/19. This document was reviewed and approved by the Site Auditor in Interim Advice Report #22 dated 29/01/19.

The Site Auditor has reviewed the draft report and consider the report is of a poor quality that does not meet LSBJV's project objectives and NSW EPA guidance. This interim advice has identified some of the main issues that need to be addressed in a revised DSI report. Other deficiencies in the report are likely to be present that have not been included in this report due to the number involved and need to be addressed by Alliance's own internal review processes. My main review comments are:

1. **Global changes**:
   a) Correct grammatical errors that occur in the report; and
   b) Throughout the report Alliance qualifies statements based on what was said in the SAQP (2019). The DSI report should not qualify such statements but make conclusions and recommendations based on their own assessment of all the available data. Otherwise, what is the point of doing the DSI?
2. **Executive Summary**: Revise to accommodate changes / additional information as recommended in this review.
3. **Section 1.2 Objectives**:
   a) The LSBJV (24/01/19) SAQP states that '*The primary objective of the DSI is to assess the potential for soil and groundwater impacts associated within the AEC's and identify further investigation or remedial actions required to render the site suitable for the WestConnex M4-M5 link tunnelling project. Other objectives are to:*

- *provide information on areas of concern identified in the PSI's;*
- *assess the potential for contaminants to impact on public health and the environment;*
- *assess (where applicable) the potential for off-site impacts from the migration of onsite impacted soils or groundwater; and*
- *assess the adequacy and completeness of all information available to be used in making decisions on remediation (if required).*

All work for the DSI is to be undertaken in general accordance with the NEPM (2013) guidelines and other NSW EPA-approved guidance'.

The objectives of the Alliance DSI report should at least cover these objectives. Where changes to the objectives have been made, these should be identified and explained.

b) The DSI objectives should address the responsibilities that the LSBJV has towards contamination management at the site. I understand these to be:

- Complying with NSW Government environmental legislation regarding contaminated site and waste management;
- Managing contamination it interferes or disturbs during the course of carrying out its work;
- Not generating contamination at the Project site or generating contamination that may cause an increase in contamination migrating from the Project site; and
- Complying with Environmental Protection Licence 21149.

The Alliance DSI should address these project objectives.

c) An additional objective of the DSI should be to incorporate the data provided by past contamination investigations undertaken at the site so that the report provides a single stand-alone assessment of contamination risks at the site.

4. **Section 1.3 Scope of Work**: The scope of work completed by the DSI should correspond to the scope described in Section 2.0 of the LSBJV (24/01/19) SAQP. Where changes to the scope of work have been made, these should be identified and explained.

5. **Section 2 Site Identification**:

a) The site identification information provided by the DSI needs to meet NSW EPA guidance and include, among other things, all relevant data provided in the SESL (March 2019) report; and

b) The site consists of Properties 1 – 9 and Bignell Lane. Provide site identification details for these 10 areas.

6. **Section 3 Geology, Acid Sulphate Soils, Topography and Hydrogeology**:

a) Rename this section '*Site Condition and Surrounding Environment*' as recommended in NEPM and NSW EPA guidance;

b) The site condition and surrounding environmental data provided by the DSI report needs to meet NSW EPA guidance and include, among other things, all relevant data provided in the SESL (March 2019) report. Provide summary information as recommended by NEPM and NSW EPA guidance covering at least the following topics:

- Topography, surface water drainage and flood potential
- Site infrastructure including buildings, roads, pavements, foundations, USTs and underground services;

- Conditions at site boundary such as type and condition of fencing, soil stability and erosion
- Presence of drums, wastes, fill
- Visible signs of contamination such as discolouration or staining of soil, bare soil patches – both on-site and off-site adjacent to site boundary
- Visible signs of plant stress
- Odours
- Geology and stratigraphic conditions
- Hydrogeology
- Background quality of surface water and groundwater
- Details of any relevant local sensitive environment – e.g. rivers, lakes, creeks, wetlands, local habitat areas, endangered flora and fauna

c) Explain why the UST locations shown in Figure 4 of the SESL (March 2019) report are different to those shown in the Alliance DSI report !!

7. **Section 3.4 Hydrogeology:** Provide a hydrogeological assessment for the PBR that meets NSW EPA guidance. This should include, among other things, the depth to groundwater, the types of groundwater systems at the site, qualitative assessment of groundwater gradients and flow velocities. In my opinion, it is likely that a transient perched aquifer occurs in the fill layer above the natural clay, a possible transient semi-confined aquifer is likely to occur near the natural soil / bedrock interface, with a semi-confined aquifer likely to occur in the bedrock fractures. If sufficient background information on hydrogeology was unavailable prior to the investigation, advise that a more detailed assessment that considers the DSI field data is provided in Section 10.4.

8. **Section 4 Previous Contamination Assessments**:

a) Rename this section '*Site History*' as recommended in NEPM and NSW EPA guidance;

b) Include summary site history information as recommended in NEPM and NSW EPA guidance;

c) Section 4.1 deals with the LSBV (January 2019) SAQP, which is not a contamination assessment. The DSI should remove this section but make reference to the document;

d) Section 4.4 deals with a SESL report dated 25/03/19 and titled '*Detailed Site Investigation, Stage 2 Pyrmont Bridge Road Site, Annandale, NSW 2038*'. I have not been provided with a copy of this report. However, I have been provided with a DRAFT SESL report of the same date titled *Detailed Site Investigation, 79 Pyrmont Bridge Road Site, Annandale, NSW 2038'.* If a Stage 2 report exists, then a copy needs to be provided to me for review. If the report referred to be Alliance is actually the draft 79 PBR report, then the correct reference needs to be provided in the Alliance DSI report;

e) I reviewed the SESL (25/03/19) draft DSI and issued an interim advice report #30 dated 4/04/19. Has the Alliance report addressed these review comments? A copy of my interim advice report #30 is attached;

f) A new subsection should be included in the Alliance report that identifies the data gaps that were not addressed by the SESL (March 2019) DSI.

9. **Section 5 Conceptual Site Model**: This section needs to be prepared in accordance with Section 4 of the NEPM (2013) Schedule B2 guideline. The essential elements of the CSM, as given by the NEPM, are:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air);
- Human and ecological receptors; and
- Potential and complete exposure pathways.

Section 5 should be subdivided into sections that reflect these four main elements.

10. **Section 5.1 Land Use Setting**: Alliance should explain that the land use setting adopted by the DSI only applies for the duration of the WestConnex construction work, after which the site is to be handled back to the Sydney Motorway Corporation when the land use setting may change to a more sensitive land use, which is not addressed by the DSI.
11. **Section 6 Data Quality Objectives**: The DQOs for the DSI should correspond to those described in Section 3 of the LSBJV (24/01/19) SAQP. Where changes to the DQOs have been made, these should be identified and explained.
12. **Section 6.1 Step 1: State the Problem**: The DSI correctly advises that Step 1 of the DQO process involves summarising the contamination problem that will require new environmental data and identifying the resources available to resolve the problem[1]. While the NEPM advises that this step will require consideration of the investigation objectives, among other things, the investigation objectives do not correspond to the problem that needs to be addressed, as proposed by the Alliance DSI. In my opinion, the Step 1 problem that needs to be addressed by the DSI is that there is a risk that contamination is present at the PBR construction site that could impact how construction activities associated with the WestConnex Project are designed and implemented so compliance is achieved with LSBJV's contractual requirements.
13. **Section 6.2 Step 2 Identify the decision / goal of the study**:

    a) The DSI correctly advises that Step 2 of the DQO process involves identifying the decisions that need to be made about the contamination problem and the new environmental data required to make them[2]. The Alliance DSI states that *'the primary goal of the study is to determine the presence and extent of potential soil, groundwater and soil vapour contamination associated with the AECs identified in the PSI (SAQP 2019)*'. In my opinion, the Step 2 goal of the study would more accurately described as being to determine the nature and extent of contamination at the PBR construction site sufficient to allow the LSBJV to manage contamination in accordance with their contractual requirements

    b) The Alliance DSI does not identify project-specific decisions that are most relevant to LSBJV's contractual requirements. In my opinion, the decisions that need to be made by the DSI are:

    - What data and contamination assessments need to be obtained that will allow the LSBJV to manage contamination it interferes or disturbs during the course of carrying out its work in accordance with NSW Government environmental legislation?
    - What data and contamination assessments need to be obtained that will allow the LSBJV not to generate contamination at the Project site or generate contamination that may cause an increase in contamination migrating from the Project site?

[1] Section 18.2.1, NEPM (2013) Schedule B2
[2] Section 18.2.2, NEPM (2013) Schedule B2

- What data and contamination assessments need to be obtained that will allow the LSBJV to comply with NSW Government environmental legislation regarding contaminated site and waste management?
- What data and contamination assessments need to be obtained that will allow the LSBJV to comply with Environmental Protection Licence 21149?

14. **Section 6.7.1 Sampling Point Density and Locations**:
    a) The DSI advises that the sample locations were selected in general accordance with NSW EPA guidelines for Property 9 (3,000m^2) and Properties 1 – and Bignell Lane (10,000m^2). Explain why the DSI subdivided the site into these two areas;
    b) The Alliance DSI should include the sample locations investigated by the SESL (March 2019) DSI. If not, explain why the SESL data should be ignored;
    c) Explain why the Alliance DSI only investigated 2 locations at Property 9 (BH05/GW05 & BH20), while the NSW EPA guidelines recommend a minimum of 9 locations;
    d) Explain why the Alliance DSI investigated 30 locations at the remainder of the site, while the NSW EPA guidelines recommend a minimum of 21 locations;
    e) Explain how sample locations and sample depths were selected;
    f) Explain what proportion of sample locations needed to collect and test natural soil samples underlying the fill layer;
    g) Determine whether the sample locations and depths used to investigate contamination at the 3 USTs met the minimum recommendations given in the NSW EPA (2014) Service Station Technical Note; and
    h) Explain the sampling rationale used to assess contamination at other point sources, such as the chimney, furnace, fuel dispenser.

15. **Section 7.1 Soil Sampling**:
    a) The DSI should confirm whether the soil sampling was undertaken in accordance with the proposed investigation methodology described in Section 6.7. Identify any non-compliances and assess their significance
    b) Explain why the fieldwork occurred over a 6 week period – was it because access to the PBR construction site was limited?
    c) One of the investigation requirements specified in Section 6.7.2 was for the investigations to penetrate at least 0.3 m into natural materials. Explain why:
        i. TP02 was terminated in the fill layer at a depth of 1.2m and was not dug into the natural soils in order to ensure the whole fill layer was properly characterised; and
        ii. BH03 was terminated in the fill layer at a depth of 0.8m and was not drilled into the natural soils in order to ensure the whole fill layer was properly characterised.
    d) Describe the procedures used to identify asbestos contamination in the field and whether these procedures met NEPM (2013) guidelines;
    e) Describe what the soil samples TANK01-01 to TANK01-05 (sample date 15/02/19) represented
    f) Describe what the sample labelled 'Water pit' (sample date 8/02/19) represented

16. **Section 7.2 Site Geology:** Provide an assessment of the site geology using all available data (including SESL data)relevant to the project objectives and DQOs.

17. **New Section 7.3 Physical Evidence of Contamination**:

    a) Provide a new section that combines the headspace screening, odour, soil staining, industrial waste (ash, slag, charcoal) and asbestos data presented in Sections 7.3 – 7.6;

    b) Provide a figure showing the location and likely extent of contamination that can be physically identified in the field; and

    c) Provide assessment of all available data (including SESL data) relevant to the project objectives and DQOs. Explain the likely sources of contamination that can be physically identified in the field. Describe the potential impacts on the LSBJV project.

18. **Section 7.7 Underground Storage Tanks:**

    a) Provide detailed information on the USTs observed at the site and associated contamination;

    b) Explain why the UST locations shown in Figure 4 of the SESL (March 2019) report are different to those shown in the Alliance DSI report !!

19. **Section 9 Data Quality Indicator Assessment:**

    a) Explain why asbestos lab tests were not undertaken on most of the fill samples where demolition was recorded as having been present and a risk of asbestos contamination was present (e.g. fill samples from TP01 – TP03, TP07 – TP10, TP12

    b) Explain why soil samples TP04 0.1-0.3 and TP05 0.1-0.3 were tested twice for OCPs

    c) Explain why soil sample TP07 0.3 was tested twice for OCPs and PCBs

    d) Explain why soil sample TP09 0.4 was tested twice for PCBs

    e) Explain why soil samples TP08 0.3, TP9 0.3, TP10 0.3, TP11 0.3 and TP12 0.3 were tested twice for OCPs and PCBs

    f) Explain why the soil sample from TP04 1.2-1.3 mbgl was not tested for VOC scans when the log records this soil as having a strong hydrocarbon odour

    g) One of the investigation requirements specified in Section 6.7.3 was for samples to be preserved. Explain why:

       i. The soil samples covered by Eurofins Report No: 638294-W advised that no attempt was evident to chill the samples (refer pdf page 235);

       ii. The soil samples covered by Eurofins Report No: 638294-S advised that no attempt was evident to chill the samples (refer pdf page 249);

       iii. The soil samples covered by Eurofins Report No: 638476-S advised that no attempt was evident to chill the samples (refer pdf page 268); and

       iv. The soil samples covered by Eurofins Report No: 639620-W advised that no attempt was evident to chill the samples (refer pdf page 304).

    h) Explain why a TCLP test for lead was not performed on the soil sample:

       i. TP02 0.7-0.9 given that it measured a total lead concentration of 2200 mg/kg;

       ii. TP04 0.1-0.3 given that it measured a total lead concentration of 2600 mg/kg;

       iii. BH03 0.6-0.8 given that it measured a total lead concentration of 2800 mg/kg;

       iv. BH04 0.15-0.3 given that it measured a total lead concentration of only 710 mg/kg; and

       v. BH21C 0.0-0.2 given that it measured a total lead concentration of 2600 mg/kg.

i) Assess the significance of the low Phenol-d6 surrogate recovery rates of 27 – 30% measured for samples GW02, GW04 and GW06 (pdf page 348).

20. **New Section 9.6 QA/QC Data Evaluation**: Provide a new section that addresses QA/QC data evaluation as required by NEPM and NSW EPA guidelines.

21. **New Section Basis for Assessment Criteria**: Provide a new section that defines appropriate Investigation Levels for all media of concern relevant to contamination risks at the site (e.g. soil, groundwater, ground vapour, aesthetics).

22. **Section 10 Discussion**:

    a) The current title of this section is meaningless and does not comply with NSW EPA reporting guidelines. Better to rename the section '*Contamination Risk Assessment*';

    b) This section is just a rehash of the data provided in the laboratory summary tables. This section needs to provide all contamination assessments required to meet the project objectives and DQOs, as previously described;

    c) The SESL (2019) investigation found elevated TCE soil vapour and high contaminant levels at some locations at the site. This data needs to be included in the assessment;

    d) A set of figures need to be provided that summarises all soil and groundwater data that exceed Investigation Levels and shows the likely extent of contamination across the site;

    e) Asses the lab results for soil samples TANK01-01 to TANK01-05;

    f) Why is the SESL (2019) data separately discussed in Section 10.6?

    g) In my opinion, the available data (or lack thereof) supports the conclusion that there remains an unacceptable risk of asbestos contamination being present in fill materials at the site. If Alliance disagrees with this statement, then the DSI needs to justify it based on the weight of evidence.

23. **Section 10.4 Groundwater Analysis**:

    a) Provide a more detailed assessment that considers the DSI field data, as recommended in **Comment 3**;

    b) Assess the significance of groundwater inflows at TP03A (0.7 mbgl), TP04 (1.2 mbgl), TP07 (1.3 mbgl) and the groundwater levels measured in the 14/03/19 GME (refer data in Table 7.8.1). Explain why groundwater inflows were not observed at other investigation locations that exceeded to a depth of at least 1.5 mbgl;

    c) Assess the significance of petroleum hydrocarbon sheen in groundwater at TP03A; and

    d) The 'Water pit' sample measured high TRH, Pb and Zn concentrations. Assess these results.

24. **Section 10.5 Aesthetics**:

    a) This section contains errors and data gaps and needs to be rewritten;

    b) Assess the nature, extent, depth and in-situ volume of fill across the site;

    c) Explain why no fill was recorded at TP06 and TP11;

    d) Explain why fill was recorded at a depth of greater than 1.5 m at TP12, BH02/GW02, BH05/GW05, BH13 and BH16. Assess the risk of unknown underground structures being present at these locations and elsewhere at the site;

    e) Provide a new figure that shows the extent of fill and thickness contours;

    f) Explain the likely source of the strong sulfur odour in natural soil recorded on the log for test pit TP01;

g) Explain the likely source of moderate hydrocarbon odour in fill at TP02;

h) Explain the likely source of strong hydrocarbon odour and groundwater sheen in natural soil at TP03A;

i) Explain the likely source of strong hydrocarbon odour in natural soil at TP04 from 1.2 m where groundwater inflow occurred;

j) Explain the likely cause of hydrocarbon staining in fill at BH16;

k) Provide a new figure that summarises the aesthetic data and estimates the extent of aesthetic impacts in subsurface conditions at the site.

25. **Section 11 Conclusions and Recommendations**: Provide conclusions and recommendations that address the project objectives and DQOs and are consistent with available data.

26. **Section 12 Statement of Limitations**: The Site Auditor should also be allowed to reply on the findings of the Alliance report.

27. **Section 13 References**:

a) Include the suffix a, b and c to the three SESL reports;

b) Change the reference to the NSW EPA site auditor guidelines to the 3rd edition dated October 2017;

c)

28. **Figures:**

a) Provide a new figure that shows the extent of fill and thickness contours;

b) Provide a new figure that summarises the aesthetic data and estimates the extent of aesthetic impacts in subsurface conditions at the site; and

c) A set of figures need to be provided that summarises all soil and groundwater data that exceed Investigation Levels and shows the likely extent of contamination across the site.

29. **Table LAR1:**

a) Include the soil asbestos, conductivity and pH test results in the summary table;

b) Correct errors in the OCP concentrations for soil sample TP10 0.3;

c) Include the PAH and VOC results for TP05 0.1-0.3 and correct the OCP concentrations;

d) Include the TANK01-01 to TANK01-05 results in the summary table.

30. **Table LAR2**:

a) Include the 'Water pit' sample results in the summary table.

31. **Appendix C Borehole Logs:**

a) Provide logs for TP02B and TP02C;

b) Show on the borelogs the groundwater levels measured at BH01/GW01, BH02/GW02, BH04/GW04 - BH06/GW06; and

c) On the logs for BH02/GW02 and BH06/GW06, show the upper soil layer as FILL.

32. **Appendix F Laboratory Documentation**:

a) Provide laboratory test certificates for samples BH2 0.2-0.4, BH02 1.0-1.2, BH02 1.9-2.1, BH02 2.7-2.9, BH06 0.2-0.4, BH13 0.0-0.2, BH13 0.8-1.0, BH13 0.8-1.0, BH13 1.5-1.7, BH13 1.9-2.1, BH16 0.1-0.3, BH16 0.6-0.8, BH16 1.3-1.5, BH16 1.8-2.0, BH17 0.2-0.4, BH17 0.9-1.1, BH17 1.5-1.7, BH19 0.0-0.2, BH19 0.6-0.8, BH21A 0.0-0.2, BH21A 0.7-

0.9, BH21B 0.05-0.2, BH21B 0.7-0.9, BH21C 0.0-0.2, BH21C 0.7-0.9, BH21C 1.3-1.5, TP02B, TP02C

Yours sincerely

Dr Ian C Swane (CPEng & CEnvP)
EPA Site Auditor NSW, WA & NT
Director, Ian Swane & Associates
Phone: 0418 867 112
Email: iswane@bigpond.com

Attachment: Interim Advice Report #30 (4 pages)

IAN SWANE & ASSOCIATES P/L
PO Box 359, MORTDALE NSW 2223

Mob: +61 0418 867 112
Email: iswane@bigpond.com

Lendlease Samsung Bouygues Joint Venture
WestConnex M4-M5 Link Tunnels
Level 7, 189 O'Riordan Street
PO Box 63, MASCOT NSW 1460

Attention: [redacted] - Environmental Manager
[redacted]

20/10/2019

SA278_191020_Interim advice#41
2018_WestConnexStage 3A

Dear [redacted]

INTERIM ADVICE #41 FOR STATUTORY SITE AUDIT No. 278 BY DR IAN SWANE REVIEW OF ALLIANCE (21/08/19) DRAFT STAGE 2 DSI FOR PYRMONT BRIDGE ROAD CONSTRUCTION SITE, WESTCONNEX STAGE 3A PROJECT

This letter provides the Lendlease Samsung Bouygues Joint Venture (LSB_JV) with interim advice as part of Statutory Site Audit No. 278 being undertaken by Dr Ian Swane, a NSW EPA Site Auditor accredited under the Contaminated Land Management (CLM) Act. The advice forms part of a statutory site audit for the WestConnex Stage 3A Project.

This interim advice concerns a revised draft version of the Alliance Geotechnical (Alliance) Stage 2 Detailed Site Investigation (DSI) report for the Pyrmont Bridge Road (PBR) construction site. The report was dated 21/08/19 and a copy provided to the Site Auditor on 26/08/19. The DSI report was revised in response to review comments provided by the Site Auditor in Interim Advice Report #38 issued on 11/06/19.

This interim 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 advice does not represent a site audit statement (SAS) or a site audit report (SAR). It is intended that a SAS / SAR will be prepared for the PBR construction site towards the end of the WestConnex Stage 3A Project.

The Site Auditor considers the data provided in the revised draft version of the Alliance Stage 2 DSI report for the PBR construction site is sufficient to allow the Site Auditor to prepare a Section B SAS concluding that:

- The nature and extent of the contamination has been appropriately determined;
- The investigation is appropriate for the stated purpose;
- The site can be made suitable for a road construction worksite at the end of construction period and prior to landscaping by RMS

The Site Audit plans to prepare the SAS / SAR in the next few weeks.

Yours sincerely

Ian C Swane

Dr Ian C Swane (CPEng & CEnvP)
EPA Site Auditor NSW, WA & NT
Director, Ian Swane & Associates
Phone: 0418 867 112 Email: iswane@bigpond.com

iswane@bigpond.com

From:	iswane@bigpond.com
Sent:	Monday, 26 July 2021 8:57 AM
To:	[redacted]
Cc:	[redacted]
Subject:	Information Request for Pyrmont Bridge Road Site, Annandale - WestConnex Stage 3A (SA278)
Attachments:	Muirs site layout.pdf

[redacted]

Please send me:

1. A concept layout plan showing the location of all the various activities that have occurred in the area. I attach a copy of the plan provided to me for the Muirs site as an example;
2. A description of the PBR worksite;
3. The area (in m sq) of Bignell Lane that forms part of the PBR worksite; and
4. A survey plan showing the boundary of the PBR worksite.

The description I require of the PBR site can be of the same form as provided for the Muirs site as recorded in my draft SAR. The description was:

'The works compound at the Muirs site was to be used by the M4-M5 Link Contractor as a works compound to facilitate the construction of the Stage 3 mainline tunnel. The site was not to be used for subsurface access or require the development of access drives or shafts. The expected layout is shown in Figure 1-4 and included:

- *Utility works including protection and/or adjustment of existing utilities, removal of redundant utilities and installation of new utilities;*
- *Establishment of site offices, amenities and temporary infrastructure;*
- *Laydown and storage of materials;*
- *Delivery of materials, plant and equipment;*
- *Construction of an acoustic shed;*
- *Construction of a temporary access tunnel;*
- *Tunnel excavation of the mainline tunnels and the Wattle Street entry and exit ramps, stockpiling of excavated material and spoil haulage;*
- *Mechanical installation and fit out of the tunnels;*
- *Finishing works including asphalting; and*
- *Demobilisation including works to prepare the site for a permissible future use.*

It was understood that the Muirs site would be demobilised and earthworks would be carried out to restore surface levels to generally pre-construction levels at the end of construction. The future use of the land was anticipated to be determined in accordance with the Residual Land Management Plan to be prepared for the project.'

I need this information for the draft SAR I am preparing for the PBR worksite.

Many thanks
Ian

Dr Ian C Swane (CPEng, CEnvP)
EPA Site Auditor
Ian Swane & Associates (mob: 0418 867 112)

Appendix D. Site Auditor Photographs

Site Inspection 2 June 2021

Photo 1: Inside workshed and tunnel entrance at PBR site

Photo 2: Truck loadout area

Photo 3: Truck loadout area

Photo 4: Outside view looking down road to be retained

Photo 5: Water Treatment Plant

Site Inspection 4 November 2022

Photo 6: Backfilling tunnel ramp and demobilisation of work area

Photo 7: Backfilling tunnel ramp

Photo 8: Demobilisation of work area

Photo 9: Demobilisation of outside area

Photo 10: Demobilisation of former water treatment plant area

Appendix E. Site Audit Statement and Interim Plan

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. **278_PBR**

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 **PBR worksite that was part of the WestConnex Stage 3A Project undertaken by the Acciona Samsung Bouygues Joint Venture (refer Figures 1 & 2). The compound consisted of three areas labelled 79 PBR, Bignell Lane and Stage 2 area:**

- **79 PBR: 79 Pyrmont Bridge Road, Annandale (northern side of Site)**
- **Bignell Lane (located between 79 PBR and the Stage 2 area)**
- **Stage 2 area: 95 Pyrmont Bridge Road, 160 – 186 Parramatta Road, Annandale** Postcode **2038**

Property description

(Attach a separate list if several properties are included in the site audit.) - **Refer Figure 3**

79 PBR: Lots 1 & 2 in DP 1108210 and Lot 250 in DP 701465

Bignell Lane: Public road corridor

Stage 2 area: Lot 1 in DP 567291, Lot 101 in DP 701466, Lot 1 in DP 510297, Lot 1 in DP80066, Lot 1 in DP 175656, Lot 1 in DP 776389, Lot 1 in DP 82718 and Lots A & B in DP 359751, and Lot 2 in DP 72951

Local government area **Inner West Council**

Area of site (include units, e.g. hectares) **Total area 14,300 m^2 (1.43 ha) comprising:**

- **79 PBR: 2,600 m^2 (0.26 ha);**
- **Bignell Lane: 3,430 m^2 (0.34 ha); and**
- **Stage 2 area: 8,300 m^2 (0.830 ha)**

Current zoning **IN1 – General Industrial**

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 [redacted] **Environment & Sustainability Manager**

Company **Acciona Samsung Bouygues Joint Venture (ASBJV) formerly Lendlease Samsung Bouygues Joint Venture**

Address **185 O'Riordan Street, Mascot NSW**

	Postcode **2020**
Phone	[redacted]
Email	[redacted]

Contact details for contact person (if different from above)

Name	[redacted]
Phone	[redacted]
Email	[redacted]

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)

Department of Planning and Environment (17 April 2018) "*Infrastructure Approval, Section 5.19 of the Environmental Planning & Assessment Act 1979, Application No: SSI 7485, Conditions of Approval for WestConnex M4-M5 Link SSI 7485*". 76 pages

☑ Requirements under other legislation (please specify, including date of issue)

NSW EPA (9 October 2018) "*Environmental Protection Licence Number 21149*". 30 pages (Ref [52])

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: Road construction worksite at the end of construction and prior to landscaping by Transport for NSW (TfNSW) – Figure 4

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

SESL and Alliance

Titles of reports reviewed:

1. Transport for NSW (August 2017) "*M4-M5 Link Environmental Impact Statement, WestConnex*"
2. SESL (18 February 2019) "*Preliminary Site Investigation, WestConnex M4-M5 Link, 79 Pyrmont Bridge Road Site, Annandale NSW 2038*". Document No: J001247 PSI 79 Pyrmont Bridge Road Annandale 1.0.docx prepared for LSBJV
3. SESL (12 March 2019) "*Preliminary Site Investigation, WestConnex M4-M5 Link Stage 2 Pyrmont Bridge Road Site, Annandale NSW 2038*". Document No: J001309 PSI Stage 2 PBR Site 1.0.doc prepared for LSBJV
4. SESL (20 May 2019) "*Detailed Site Investigation, 79 Pyrmont Bridge Road, Annandale*". Document No: J001248 DSI 79 Pyrmont Bridge Road Annandale 1.0.doc prepared for LSBJV
5. Alliance Geotechnical (21 August 2019) "*Stage 2 Detailed Site Investigation, WestConnex M4-M5 Link Tunnels, Pyrmont Bridge Road (PBR) Site*". Document No: 8272-ER-1-3 Rev D prepared for LSBJV
6. ASBJV (18 November 2022) Email providing additional data on contamination management at PBR site during construction

Other information reviewed, including previous site audit reports and statements relating to the site:

50. Department of Planning and Environment (17 April 2018) "*Infrastructure Approval, Section 5.19 of the Environmental Planning & Assessment Act 1979, Application No: SSI 7485, Conditions of Approval for WestConnex M4-M5 Link SSI 7485*". 76 pages

51. Not used

52. NSW EPA (9 October 2018) '*Environmental Protection Licence Number 21149, WestConnex Stage 3A – M4-M5 Mainline Tunnels, WestConnex between M4 East at Haberfield and the New M5 at St Peters, Marrickville NSW 2204'*. 30 pages

53. LSBJV (10 October 2018) "*Site Establishment Management Plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0018-07

54. LSBJV (23 October 2018) "*Appendix B, Contaminated Land Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0021-01 Rev01

55. LSBJV (23 October 2018) "*Unexpected Contaminated Land and Asbestos Finds Procedure, M4-M5 Link Mainline Tunnels*". Appendix A of Ref [54]

56. LSBJV (31 October 2018) "*Parramatta Road East and West Civil Sites Waste Management Plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-MUI-EN-MP01-PLN-0002-A

57. LSBJV (17 April 2020) "*Appendix B5, Soil and Surface Water Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0005-09 Rev09

58. LSBJV (22 June 2020) "*Appendix B9, Waste Management Sub-plan, M4-M5 Link Mainline Tunnels"*. Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0009-07 Rev08

59. JM Environments (19 September 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey*". Document No: JME18057-3-1 provided for LSBJV

60. JM Environments (9 November 2018) "*Pyrmont Bridge Road Tunnel and Civil, Hazardous Building Material Survey - 2*". Document No: JME18057-11 provided for LSBJV

61. LSBJV (23 October 2018) "*Construction Work Method Statement, Demolition Works – Pyrmont Bridge Road*"

62. LSBJV (28 April 2021) "*Appendix B6 Groundwater Management Sub-plan, M4-M5 Link Mainline Tunnels*". Document No: M4M5-LSBJ-PRW-EN-MP01-PLN-0006-13 Rev13 (revision 1 dated 17 September 2018)

63. PSM (9 April 2020) Drawings "*M4-M5 Link Main Tunnel Works, Pyrmont Bridge Road, Construction Access Backfill and Stub Wall*". Document No: M4M5 PSML PBR STR IS21 DRG 1000 comprising 8 drawings prepared for Sydney Motorway Corporation WestConnex

64. ASBJV (27 June 2022) Drawings "*M4M5 Link Main Tunnel Works, Package: Project Wide M4M5-RBGP-PRW-CIV-CW02-DPK-0001, Construction Site Reinstatement*". 51 drawings prepared for Sydney Motorway Corporation WestConnex

65. ASBJV (14 September 2022) Drawings "*M4M5 Link Main Tunnel Works, Pyrmont Bridge Road Surface Demob CEMP Layouts*". Document No: M4M5-LSBJ-PBR-GEN-MTD-DRG-2207 comprising 4 drawings prepared for Sydney Motorway Corporation WestConnex

Site audit report details

Title **Site Audit Report, Site Audit 278_PBR by Dr Ian Swane, WestConnex Stage 3A Pyrmont Bridge Road Worksite (Area C9), Annandale**

Report no**. 278_PBR** Date **25 November 2022**

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~~

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- ❑ ~~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):~~

~~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~~

---

[2] Refer to Part IV for an explanation of an environmental management plan.

~~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].~~

~~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:

To outline the additional work needing to be completed to allow a Section A2 site audit statement to be issued.

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~~

[3] Refer to Part IV for definitions of active and passive control systems.
[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

~~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): Road construction worksite at the end of construction period and prior to landscaping by TfNSW as approved by Department of Planning and Environment (17 April 2018) "*Infrastructure Approval, Section 5.19 of the Environmental Planning & Assessment Act 1979, Application No: SSI 7485, Conditions of Approval for WestConnex M4-M5 Link SSI 7485*" (Ref [50])**

IF the site is~~ remediated/~~managed* in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title	**Interim Management Plan for Contamination at the PBR Worksite, WestConnex Stage 3 Project**
Plan author	**ASBJV**
Plan date	**25 November 2022** No. of pages **1**

SUBJECT to compliance with the following condition(s):

1. **The long-term environmental management plan (LTEMP) is prepared by a suitably qualified and experienced environmental consultant in accordance with EPA guidance.**
2. **The LTEMP is to manage the residual contamination risks that remain at the PBR site, as described in the site audit report.**
3. **ASBJV is to provide the Site Auditor with further information on classification and disposal of excavated soil that was removed from the PBR site and disposed as waste.**
4. **ASBJV is to provide the Site Auditor with further information on the importation of backfill material placed in the tunnel decline.**
5. **ASBJV is to provide the Site Auditor with further information on demobilisation work and reinstatement of the PBR site demonstrating that the final condition of the PBR site has been achieved.**
6. **Following completion of the minor work and after a written approval of the LTEMP has been issued by the Site Auditor and TfNSW, a Section A2 site audit statement is to be prepared and issued.**

Overall comments:

1. **The site auditor reviewed site environmental management plans that dealt with contamination at the PBR site and considered the plans met Condition C22 of the Planning Consent sufficient for the purpose of this site audit.**
2. **The site auditor reviewed contamination assessments for the PBR site and considered they met Condition E181 of the Planning Consent sufficient for the purpose of this site audit.**
3. **The site auditor reviewed reports on the management of contamination at the PBR site throughout the period construction activities occurred and considered that:**
    a) **No additional contamination was generated by the construction work;**
    b) **The land was maintained in a condition suitable for a road construction worksite and compliance was achieved with Conditions E182 to E185 of the Planning Consent sufficient for the purpose of this site audit;**
    c) **Waste generated by construction activities at the PBR site was likely to have been managed in general accordance with NSW EPA guidance and Conditions E202 to E204 of the Planning Consent sufficient for the purpose of this site audit; and**

d) **The requirements of Conditions O5.10 and O5.11 of EPL 21149 were met sufficient for the purpose of this site audit.**

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 **25 November 2022**

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.

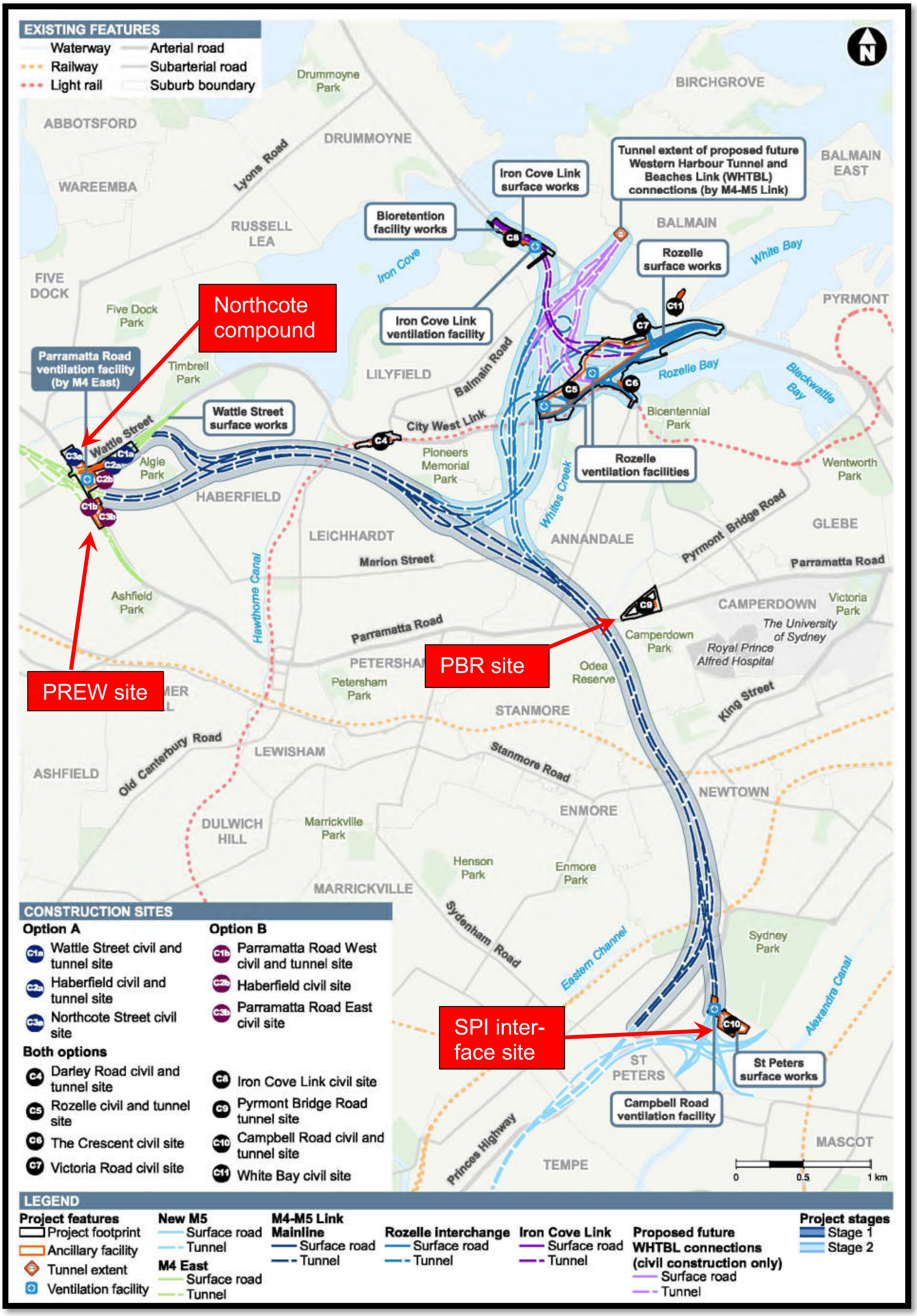

Figure 1 Overview of Project Footprint and Construction Ancillary Facilities (Source: Ref [50])

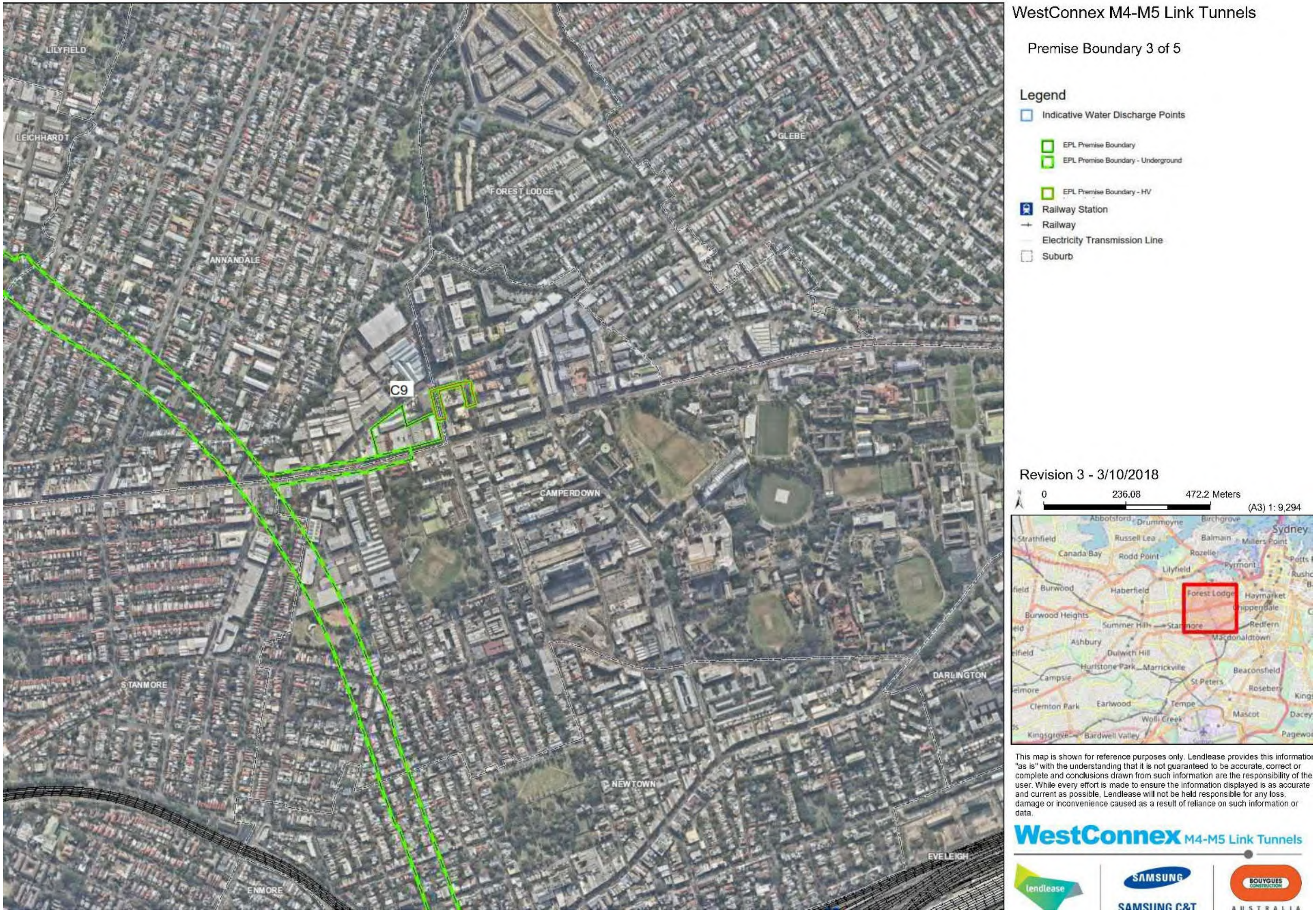

Figure 2 Location Plan for PBR Worksite Area C9 (Source: Map 3, Ref [52])

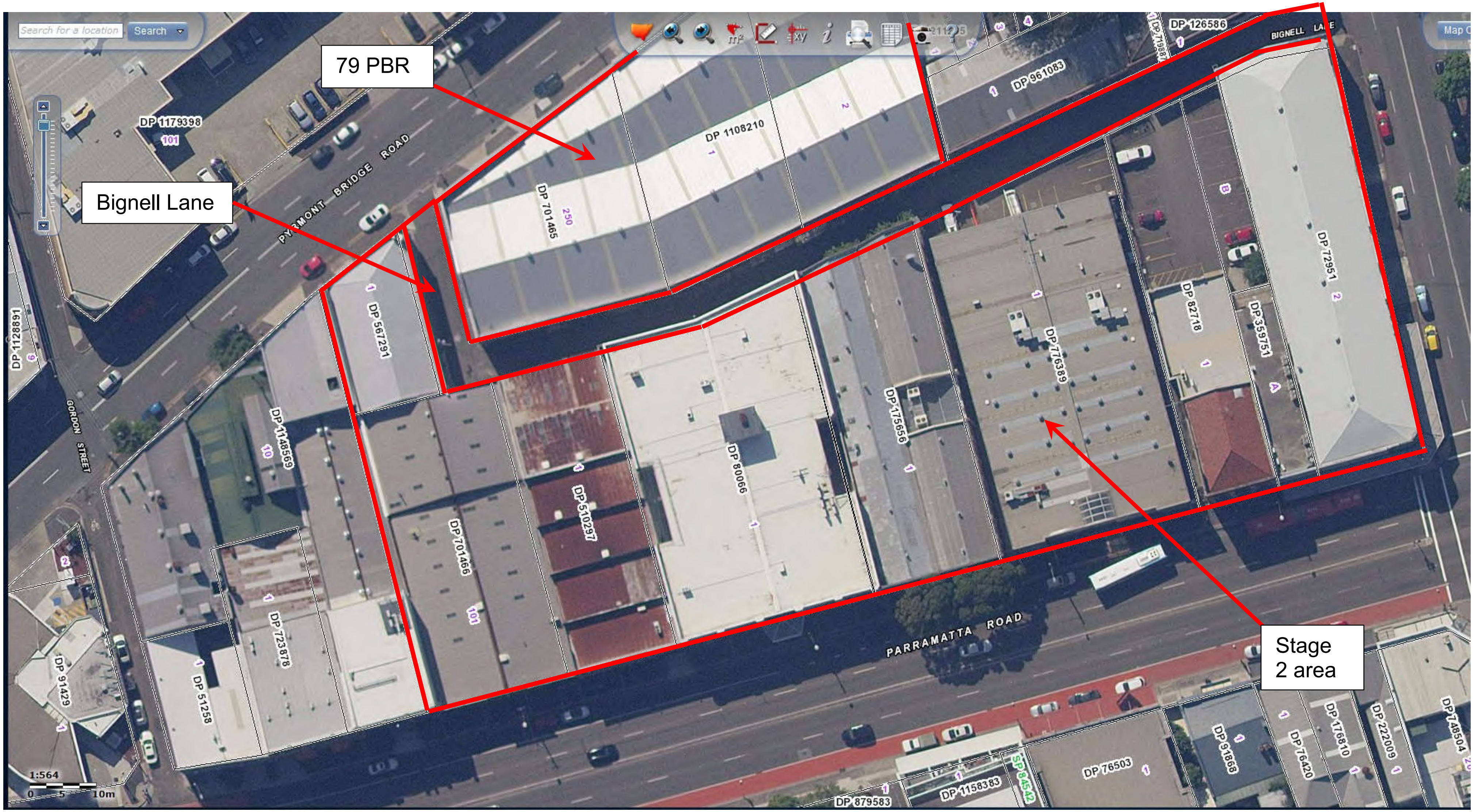

Figure 1-3 Six Maps 2018 Subdivision Plan for PBR Worksite Area C9

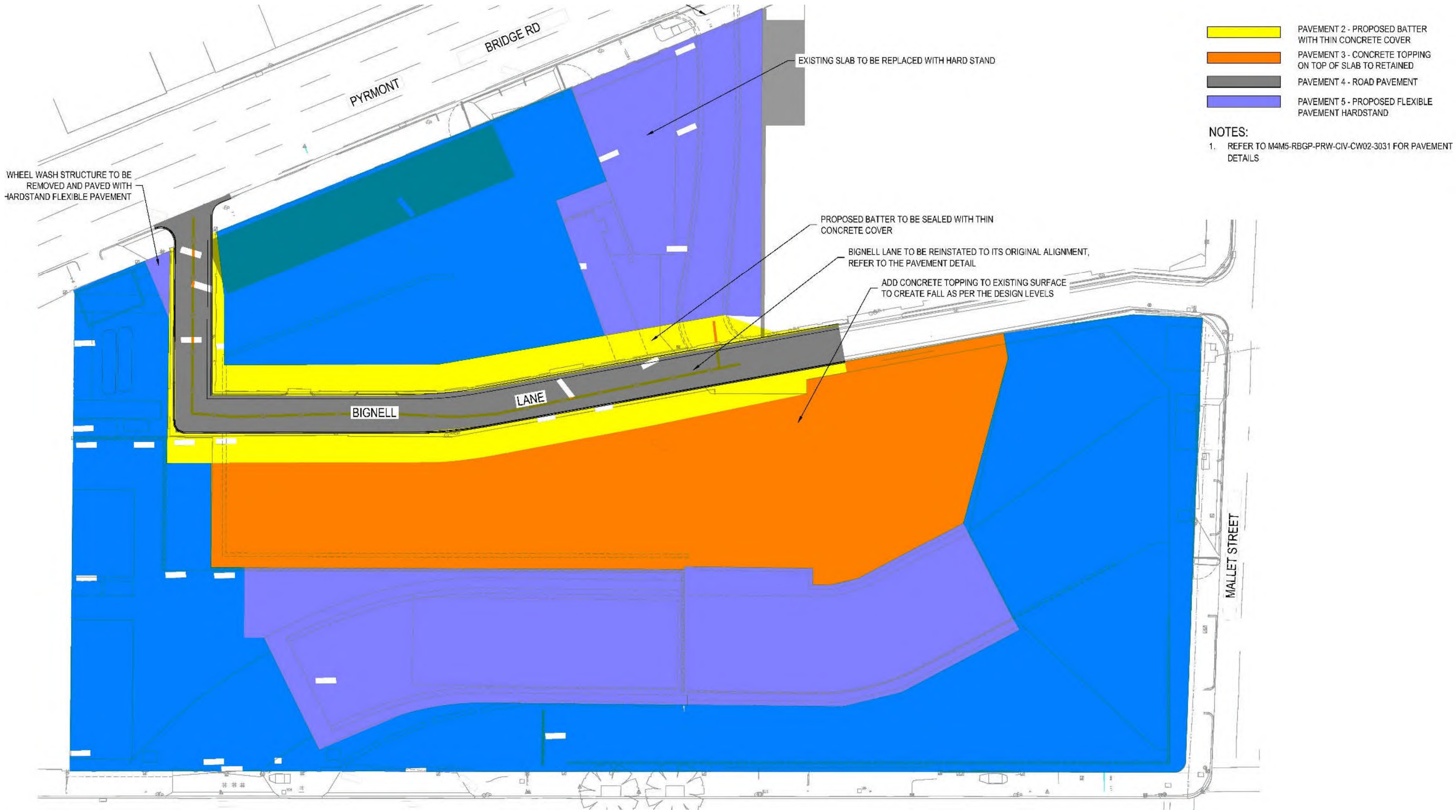

Figure 1-4 Pavement Plan for Reinstated Condition of PBR Site

Interim Management Plan for Contamination at the PBR Worksite, WestConnex Stage 3 Project

The Purpose of this Interim Management Plan is to outline the additional work that needs to be completed at PBR to allow a Section A2 Site Audit Statement (SAS) to be issued. This additional work consists of two parts.

Part 1: Long-term Environmental Management Plan (LTEMP)

An LTEMP is currently being prepared by a suitably qualified and experienced environmental consultant in accordance with EPA guidance; this will facilitate the management of any residual contamination risks that remain at the PBR site, as described in the site audit report, associated with the below items:

- TRH contamination remaining at former UST areas;
- Unknown USTs remaining at the Site;
- Unknown pits remaining at the Site;
- Unknown buried services remaining at the Site; and
- Unknown contamination hotspots remaining in fill at the Site.

Part 2: Remaining Site Works

Prior to formal handover of the PBR site there are several works that need to be completed to reach the final condition required under the contract. Activities are described below with the risk of contamination to be managed in accordance with the existing environmental management plan.

Demolition of Acoustic Shed and Removal of Site Offices

This work is planned to occur over the last four weeks of 2022 and be completed in the first quarter of 2023 at the latest. Shed removal will continue by hand between Bignell Lane and Parramatta Road with waste segregation prior to disposal, whilst the sheds have been sold to another project for reuse.

Reinstatement of Bignell Lane

Bignell Lane will be returned to the existing alignment by the end of quarter 1 in 2023. Work to remove the concrete slab and install services will be completed in the last four weeks of 2022. Road pavement and line marking will be completed in 2023.

Demolition of Decline and Support Structures

Decline retaining walls, piles and capping beam will be removed along with the support structures for the construction office. Contamination in this area was managed during site establishment thus little risk remains. This work is largely expected to be undertaken in the first quarter of 2023.

Removal of LV switchyard and temporary Bignell Lane

The temporary realigned section of Bignell Lane and the adjacent LV switchyard are to be removed in early 2023 and completed by the end of the quarter. This area presents little contamination risk as it was built by the project and following its removal will be capped by way of chip sealing.

Decommission Water Management System

Underground 'first flush' tanks, plumbing and water management system will be decommissioned for removal in the first quarter of 2023 and any exposed or damaged areas of site sealed for handover.