



**Claremont Meadows Service Facility**

**CPB Contracting and Ghella Joint Venture**

**Validation Report**

**JBS&G 63723 | 162,154 (Rev 0)**

**21 November 2024**





**We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.**

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

**Caring for Country** The Journey of JBS&G  
**Artist:** Patrick Caruso, Eastern Arrernte



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## Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
BGS	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CLM Act	Contaminated Land Management Act 1997
CMSF	Claremont Meadows Services Facility
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CPBG-JV	CPB Contracting and Ghella Joint Venture
DGA	Data Gap Assessment
DP	Deposited Plan
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
ESL	Ecological Screening Level
HHGRA	Hazardous Ground Gas Risk Assessment
HIL	Health Investigation Level
HSL	Health Screening Level
IEMP	Interim Environmental Management Plan
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEMP	PFAS National Environmental Management Plan
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticide
OPP	Organophosphate Pesticide
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Consistency, Completeness, Sensitivity
PCB	Polychlorinated Biphenyl
POEO Act	Protection of the Environment Operations Act 1997
PFAS	Per- and Polyfluoroalkyl Substances
PSI	Preliminary Site Investigation
QA/QC	Quality Assurance / Quality Control

Term	Definition
RAP	Remedial Action Plan
RPD	Relative Percent Difference
SBT	Station Boxes and Tunnels
SM-WSA	Sydney Metro Western Sydney Airport
TRH	Total Recoverable Hydrocarbons
TTMP	Tetra Tech Major Projects Pty Ltd
UFP	Unexpected Finds Protocol
VENM	Virgin Excavated Natural Material

## Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by CPB Contracting and Ghella Joint Venture (CPBG-JV, the client) to undertake the validation of the Claremont Meadows Services Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows, NSW (the site). The site is being used to support the delivery of the Sydney Metro Western Sydney Airport (SM-WSA) Station Boxes and Tunnels (SBT) project (the Project). This report relates to the property identified as part Lot 1601 in Deposit Plan (DP) 1282557, as shown in **Figures 1 and 2**.

The Project forms part of the broader Sydney Metro network and involves the construction and operation of a new 23 km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The alignment includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections. The site is to be used for construction purposes, including materials lay-down areas, site facilities and amenities, a drive shaft to access the tunnels and housing a water treatment plant.

The site has an approximate area of 4 hectares and has been historically used for residential and agricultural uses. Environmental Earth Sciences (EES) prepared a *Remedial Action Plan* (RAP) (EES 2022a<sup>1</sup>) instructing the remediation and validation works required for the CMSF site. The RAP referred to previous investigations for the Claremont Meadows Service Facility site including the *Contamination Assessment Report* (Cardno 2021a<sup>2</sup>), *Contamination Assessment Report – Phase D/E* (Cardno 2021b<sup>3</sup>), *Factual Contamination Report – Preliminary Site Investigation* (Golder-DP 2021<sup>4</sup>), Sydney Metro – Western Sydney Airport Technical Paper 8: Contamination. (M2A 2020<sup>5</sup>), *Detailed Site Investigation* (DSI, EES 2022b<sup>6</sup>) and *Waste Classification and On-site Re-Use Assessment of Stockpiled Soil Material* (EDP 2022<sup>7</sup>).

Previous investigations across the CMSF site did not identify evidence of widespread or diffuse contamination but identified the risk for unexpected finds and the requirement of a data gap assessment.

During the development works the following management processes were implemented at the site:

1. Completion of intrusive investigations to close out data gaps identified in the RAP (EES 2022a);
2. Implementation of the projects Contamination and PASS Management Plan during development works as documented in the in Appendix A of the RAP (EES 2022a); and
3. Implementation of materials tracking during the development works. All appropriate documentation for materials tracking within the site as well as materials imported to the site and disposed of from the site as provided by the client are presented and summarised within this validation report.

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<sup>1</sup> *Remedial Action Plan – 1-17 Gipps Street Claremont Meadows NSW*. Environmental Earth Sciences. 26 September 2022. Version 4 (EES 2022a)

<sup>2</sup> *Contamination Assessment Report*, Sydney Metro Western Sydney Airport, Cardno, 5 May 2021, Report reference: 80021888 (Cardno 2021a)

<sup>3</sup> *Contamination Assessment Report – Phase D/E*, Sydney Metro Western Sydney Airport, Cardno, 26th November 2021, Report reference: 80021888; RevB, (Cardno 2021b)

<sup>4</sup> *Factual Contamination Report – Preliminary Site Investigation*. Golder & Douglas Partners 19 Feb 2021, Ref: 19122621-003-R-Rev3; Rev3 (Golder-DP 2021)

<sup>5</sup> Sydney Metro – Western Sydney Airport, Technical Paper 8: Contamination. M2A Joint Venture (M2A) (2020) (M2A 2020)

<sup>6</sup> *Detailed Site Investigation Detailed Site Investigation for Claremont Meadows Services Facility*. Environmental Earth Sciences NSW (2022), 27 July 2022, Ref. 122045RP01V2, (EES 2022b)

<sup>7</sup> *Waste Classification and On-site Re-Use Assessment of Stockpiled Soil Material 1-17 Gipps Street, Claremont Meadows NSW*. EDP Consulting, 13 April 2022, Ref. S- 03958.WCC.001 V3, (EDP 2022)



Two unexpected finds were identified during the site works (North Area CMSF and Car Park Area CMSF). Both unexpected finds were remediated by excavation and off-site disposal. Validation was completed in general accordance with the requirements of the RAP (EES 2022a).

Additional assessments were undertaken to ensure that the site was environmentally suitable consisting of:

- *Data gap assessment for additional targeted investigation near the north boundary at the Claremont Meadows Services Facility* (EES 2023a<sup>8</sup>) documents the data gap assessment completed to assess potential risks associated with a potential historic use as a service station at the northern boundary of site. EES (20223a) concluded that based upon results and findings from this assessment, there is no unacceptable risk to human health or the environment for ongoing commercial / industrial land use (Setting D) due to the alleged former service station. As such additional assessment and/ or remediation were not considered necessary; and
- EES (2023b<sup>9</sup>) documents the Hazardous Ground Gas Risk Assessment (HGGRA) completed to assess risks posed by potential hazardous ground gases to aboveground construction workers on the CMSF site during development of the shaft, as well as to address data gaps identified during the detailed site investigation (DSI, EES 2022b). Following the monthly monitoring from June 2023 to October 2023 and EES prepared *Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF)* (EES 2023h) which determined the cessation of the land fill gas monitoring was appropriate.

Based on the findings of the previous investigations and this validation assessment, and subject to the limitations in **Section 12**, it is considered that the development works were completed in general accordance with the RAP (EES, 2022a). There is considered to be sufficient information to conclude there is a low potential for risk to site users from contamination and the Claremont Meadows Service Facility site is considered suitable for the intended commercial / industrial land use.

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<sup>8</sup> *Data gap assessment for additional targeted investigation near the north boundary at the Claremont Meadows Services Facility – 1-17 Gipps St, Claremont Meadows NSW 2747*. Environmental Earth Sciences. 30 September 2022 (EES 2023a)

<sup>9</sup> *Hazardous Ground Gas Risk Assessment – Claremont Meadows Services Facility Road and Rail Excavations Pty Ltd*. Environmental Earth Sciences. 6 April 2023. Ref: 122045 Version 1 (EES 2023b)

# 1. Introduction

## 1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by CPB Contracting and Ghella Joint Venture (CPBG-JV, the client) to undertake environmental consultancy services associated with the validation of the Claremont Meadows Servies Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows, NSW (the site). The site is being used to support the delivery of the Sydney Metro Western Sydney Airport (SM-WSA) Station Boxes and Tunnels (SBT) project (the Project). This report relates to the property identified as part Lot 1601 in Deposit Plan (DP) 1282557, as shown in **Figures 1 and 2**.

The Project forms part of the broader Sydney Metro network and involves the construction and operation of a new 23 km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The alignment includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections. The site is to be used for construction purposes, including materials lay-down areas, site facilities and amenities, a dive shaft to access the tunnels and to accommodate a water treatment plant.

The site has an approximate area of 4 hectares and has typically been historically used for private residence and market-garden scale agricultural uses before being purchased in 1974 and then transferred/ sold between various NSW state government entities.

Environmental Earth Sciences (EES) prepared a *Remedial Action Plan (RAP)* (EES 2022a<sup>10</sup>) instructing the remediation and validation works required for the CMSF site. The RAP referred to previous investigations for the Orchard Hills site including the *Contamination Assessment Report* (Cardno 2021a<sup>11</sup>), *Contamination Assessment Report – Phase D/E* (Cardno 2021b<sup>12</sup>), *Factual Contamination Report – Preliminary Site Investigation* (Golder-DP 2021<sup>13</sup>), Sydney Metro – Western Sydney Airport Technical Paper 8: Contamination. (M2A 2020<sup>14</sup>), *Detailed Site Investigation (DSI)*, (EES 2022b<sup>15</sup>) and *Waste Classification and On-site Re-Use Assessment of Stockpiled Soil Material* (EDP 2022<sup>16</sup>).

Previous investigations across the CMSF site did not identify evidence of widespread or diffuse contamination but identified the risk for unexpected finds and the requirement of a data gap assessment.

The following management plans have been prepared for the Project:

- *Construction Environment Management Plan (CEMP)*, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works, Preparatory Works, CPB Contractors – Ghella. SMWSASBT-CPG-1NL-EV-PLN-000002). Rev 2 dated 13 April 2022

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<sup>10</sup> *Remedial Action Plan – 1-17 Gipps Street Claremont Meadows NSW*. Environmental Earth Sciences. 26 September 2022. Version 4 (EES 2022a)

<sup>11</sup> *Contamination Assessment Report*, Sydney Metro Western Sydney Airport, Cardno, 5 May 2021, Report reference: 80021888 (Cardno 2021a)

<sup>12</sup> *Contamination Assessment Report – Phase D/E*, Sydney Metro Western Sydney Airport, Cardno, 26th November 2021, Report reference: 80021888; RevB, (Cardno 2021b)

<sup>13</sup> *Factual Contamination Report – Preliminary Site Investigation*. Golder & Douglas Partners 19 Feb 2021, Ref: 19122621-003-R-Rev3; Rev3 (Golder-DP 2021)

<sup>14</sup> Sydney Metro – Western Sydney Airport, Technical Paper 8: Contamination. M2A Joint Venture (M2A) (2020) (M2A 2020)

<sup>15</sup> *Detailed Site Investigation Detailed Site Investigation for Claremont Meadows Services Facility*. Environmental Earth Sciences NSW (2022), 27 July 2022, Ref. 122045RP01V2, (EES 2022b)

<sup>16</sup> *Waste Classification and On-site Re-Use Assessment of Stockpiled Soil Material 1-17 Gipps Street, Claremont Meadows NSW*. EDP Consulting, 13 April 2022, Ref. S- 03958.WCC.001 V3, (EDP 2022)

- *Asbestos Management Plan (AMP), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works*. CPB Contractors – Ghella. 21 November 2022. Project number: WSA-200-SBT, Document number: SMWSASBT-CPG -1NL-NL000-SF-PLN-000024, Revision B.
- *Unexpected Finds Protocol (UFP)*. CPB Contractors – Ghella. WSASBT-00-10-PRC-CPBGEM-09
- *Waste and Recycling Management Sub-plan*. CPB Contractors – Ghella. SMWSASBT-CPG-1NL-NL000-WM-PLN-000001)
- *Spoil Management Plan (SPMP)*. CPB Contractors – Ghella. SMWSASBT-CPG-SWD-SW000-EN-PLN-202027

The proposed future use of the CMSF site is commercial / industrial. This validation report has been prepared in accordance with the requirements of the NSW Environmental Protection Authority (EPA) published and endorsed guidelines.

## 1.2 Objectives

The objectives of the validation assessment were to:

- Document the contamination status of the site prior to commencement of earthworks;
- Document the remediation / management of materials identified in the RAP;
- Assess and document the management any unexpected finds as encountered during the earthworks;
- Review the material tracking documentation associated with the movement of earth based material within site, imported to the site and disposed from the site during the works;
- Validate any remedial works in accordance with the relevant NSW EPA guidelines and requirements of the RAP prepared for the project; and
- Document the validation process carried out to demonstrate the suitability of the site for the proposed commercial/industrial land use.

## 1.3 Construction Activities and Proposed Development

The CMSF proposed development and construction activities scope included:

- Installation of fencing;
- Installation of environmental mitigation including erosion and sediment controls;
- Clearing of vegetation;
- Unexpected find contamination remediation and offsite disposal;
- Local area works including property adjustments to access roads, roadways, footpaths, driveways and boundaries;
- Site levelling including drainage;
- Utility works and temporary services;
- Establishment and operation of offices, amenities, car parking and access roads including erection of demountable buildings and associated structural framework;
- Installation and commissioning of temporary water treatment plant and associated concrete bunds;
- Installation of piling pads, footings and foundations;
- Bored piling works;

- Services facility shaft excavation using ripper and rock hammers;
- Construction of part of the cast-in-situ permanent shaft;
- Cross passage construction support;
- Invert construction support (pouring of an invert concrete slab in the tunnel); and
- Operation of water treatment plant and discharge of water.

## 1.4 Regulatory Requirements

### 1.4.1 Development Conditions

The compliance of the validation of the site with the conditions of consent is detailed following in **Table 1.1**.

**Table 1.1: Summary of Development Consent Requirements**

Condition	Description	Compliance
E92	<p>Before commencement of any construction that would result in the disturbance of medium to high risk contaminated sites as identified in the documents identified in Condition A1, Detailed Site Investigations (for contamination) must be conducted to determine the full nature and extent of the contamination. The Detailed Site Investigation Report(s) and the subsequent report(s), must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Detailed Site Investigations must be undertaken in accordance with guidelines made or approved under section 105 of Contaminated Land Management Act 1997 (NSW).</p> <p>Note: Nothing in this condition prevents the Proponent from preparing individual Detailed Site Investigation Reports (for contamination) for separate sites.</p>	DSI (EES 2022b)
E93	<p>Should remediation be required to make land suitable for the final intended land use, a Remedial Action Plan must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Remedial Action Plan must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997 (NSW) and must include measures to remediate the contamination at the site to ensure the site will be suitable for the proposed use when the Remedial Action Plan is implemented.</p> <p>Note: Nothing in this condition prevents the Proponent from preparing individual Remedial Action Plans for separate sites.</p>	Remediation has not been identified as required to make the site suitable. An RAP was prepared for management of unexpected finds (EES 2022a)
E94	<p>Before commencing remediation, a Section B Site Audit Statement(s) must be prepared by an NSW EPA-accredited Site Auditor that certifies that the Remedial Action Plan(s) is/are appropriate and that the site can be made suitable for the proposed use. The Remedial Action Plan(s) must be implemented and any</p>	Not Applicable



Condition	Description	Compliance
	<p>changes to the Remedial Action Plan(s) must be approved in writing by the NSW EPA-accredited Site Auditor.</p> <p>Note: Nothing in this condition prevents the Proponent from engaging an NSW EPA-accredited Site Auditor to prepare individual Site Audit Statements for Remedial Action Plans for separate sites.</p>	
E95	<p>Validation Report(s) must be prepared in accordance with Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA, 2020) and relevant guidelines made or approved under section 105 of the Contaminated Land Management Act 1997 (NSW).</p> <p>Note: Nothing in this condition prevents the Proponent from preparing individual Validation Reports for separate sites.</p>	Presented here
E96	<p>A Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan) and its accompanying Site Audit Report, which state that the contaminated land disturbed by the work has been made suitable for the intended land use, must be submitted to the Planning Secretary and the Relevant Council(s) after remediation and before the commencement of operation of the CSSI.</p> <p>Note: Nothing in this condition prevents the Proponent from obtaining Section A Site Audit Statements for individual parcels of remediated land.</p>	To be prepared on the basis of this Validation Report
E97	A copy of Detailed Site Investigation Report(s), Remedial Action Plan(s), Validation Report(s), Site Audit Report(s) and Site Audit Statement(s) must be submitted to the Planning Secretary and the Relevant Council(s) for information	Pending
E98	An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared before the commencement of construction and must be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during construction.	Appendix A, RAP (EES 2022a)
E99	The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout construction.	Ongoing

#### 1.4.2 Contractual Conditions

An assessment of relevant requirements of the SBT Design and Construction Deed is provided in **Table 1.2**.

**Table 1.2: Summary of Contractual Requirements for Remedial Action Plans**

Condition	Description	Compliance
12.20(a)	The SBT Contractor must prepare and submit to the Principal's Representative and the Independent Certifier a Remediation Action Plan in respect of each Detailed Site Investigation performed in accordance with clause 12.19 prior to commencing any excavation activities (except in relation to Preliminary Works).	RAP (EES 2022a)
12.20(b)	Except in relation to the Remediation Action Plan in respect of Orchard Hills East Station, the SBT Contractor may not submit a Remediation Action Plan under this clause unless and until the Detailed Site Investigation report for the relevant area has been submitted to the Principal's Representative and has not been the subject of a notice under clause 12.19(f)(ii) within the time period specified in clause 12.19(f)(ii) (or clause 12.19(g)) as applicable.	DSI (EES 2022b)

Condition	Description	Compliance
12.20(c)(i)	Each Remediation Action Plan must: Describe the nature and extent of Contamination based on the Detailed Site Investigation, the Information Documents and any other relevant information which is necessary to characterise the risk to the construction, operation and maintenance of Sydney Metro – Western Sydney Airport;	RAP (EES 2022a)
12.20(c)(ii)	Describe the manner in which the SBT Contractor will Remediate Contamination within the proposed areas of excavation and/or disturbance;	RAP (EES 2022a)
12.20(c)(iii)	Include a detailed risk assessment to determine and describe the requirements for Remediation of Contamination of land (including soil, groundwater, ground gas and vapour) within the Construction Site or Extra Land surrounding the area of proposed excavation or disturbance with respect to potential exposure scenarios, including but not limited to migration of Contamination via groundwater, ground gas and odour into the areas of excavation or disturbance;	Not required based on limited extent of contamination identified in the DSI (EES 2022b) and high certainty remedial approach adopted (EES 2022a)
12.20(c)(iv)	Present a preferred Remediation option based on: (A) Whole-of-life costs; (B) To the extent practicable, maintaining the Overall D&C Program (C) Benefits (as far as is practicable based on available infrastructure design information); and (D) Compliance with this deed;	RAP (EES 2022a)
12.20(c)(v)	Define what will constitute Remediation Practical Completion of the Remediation;	RAP (EES 2022a)
12.20(c)(vi)	Be prepared in accordance with Law, Approvals, applicable Codes and Standards, the lawful requirement of any Authority, Good Industry Practice, all guidelines made or approved by the EPA, the National Remediation Framework, the Human Health and Environment Risk Assessment and any other requirements of this deed;	RAP (EES 2022a) prepared in accordance with EPA published or endorsed guidelines
12.20(c)(vii)	Be reviewed and approved by a Certified Contaminated Land Consultant;	RAP (EES 2022a) report signatory is a Certified Contaminated Land Consultant
12.20(c)(viii)	Be reviewed and endorsed by an Accredited Site Auditor;	Completed
12.20(c)(ix)	Be accompanied by an Interim Site Audit Advice prepared by the Accredited Site Auditor when submitted to the Principle's Representative and the Independent Certifier in accordance with clause 12.20(a);	Completed
12.20(c)(x)	Include details of any Remediation completed during the performance of any Preliminary Works; and	None provided / completed. Very limited extent of contamination on-site.
12.20(c)(xi)	Consider and plan to mitigate the migration of Contamination from the Construction Site.	RAP (EES 2022a)

Condition	Description	Compliance
12.20(d)(i)(A)	<p>In addition to the requirements set out in clause 12.20(c) and without limiting clause 12.20(j), each Remediation Action Plan must contain sufficient detail and justification to enable the determination of any Agreed Remediation Scope, including:</p> <p>An ACC Classification and Excavation Map, being a detailed map or maps, drawn to a practical scale of the relevant area the subject of a Remediation Action Plan that accurately identifies:</p> <p>The location of any samples that have been taken by and/or made available to the SBT Contractor, including the Detailed Site Investigation samples or any relevant information provided to the SBT Contractor in the Information Documents; and</p>	The contractual requirement to prepare an ACC Classification and Excavation Map was not triggered for Claremont Meadows.
12.20(d)(i)(B)	A detailed mapping of remaining Solid Waste and its respective waste classification in accordance with the Waste Classification Guidelines and the relevant provisions of the POEO Act including resources recovery exemptions and orders across the relevant area the subject of the Remediation Action Plan, based on the relevant Detailed Site Investigations and clearly detailing the extent of lateral and vertical classification of Waste within each area the subject of a Remediation Action Plan;	The contractual requirement to prepare an ACC Classification and Excavation Map was not triggered for Claremont Meadows.
12.20(d)(ii)	A detailed excavation plan that is consistent with the ACC Classification and Excavation Map prepared under clause 12.20(d)(i) describing the quantities in tonnes and cubic meters of each material, including a register in estimated tonnes and cubic meters of each waste classification of Solid Waste, proposed to be excavated and to be reused and/or disposed offsite (ACC Excavation Quantity Register);	The contractual requirement to prepare an ACC Classification and Excavation Map was not triggered for Claremont Meadows.
12.20(d)(iii)	Details of any other elements of Remediation that are required to mitigate risks to the construction, operation and maintenance of Sydney Metro – Western Sydney Airport including, but not limited to infrastructure design requirements, treatment of Contamination, capping and containment; and	RAP (EES 2022a)
12.20(d)(iv)	Precise details of how the validation of Remediation will be achieved and demonstrated.	RAP (EES 2022a)

## 2. Site Condition and Surrounding Environment

Site details are provided in the following sections. More extensive site descriptions are available in the RAP and DSI (EES 2022a and 2022b).

### 2.1 Site location and Identification

The location of the site is shown on **Figure 1** and the site layout is shown on **Figure 2**. The site details are summarised in **Table 2.1**, with the site described in detail in the following sections.

**Table 2.1: Site Identification Details**

<b>Lot/DP</b>	Part Lot 1601 in DP 1282557
<b>Address</b>	1-17 Gipps Street, Claremont Meadows, NSW 2747
<b>Local Government Authority</b>	Penrith City Council
<b>Site Zoning</b>	R3 (Medium Density Residential) and E3 Productivity Support
<b>Approximate Coordinates of Centre of Site Areas (GDA 94, MGA 56)</b>	292045 E, 6261168 N
<b>Previous Use</b>	Cleared vacant land
<b>Proposed Use</b>	Commercial / Industrial – construction site
<b>Site Area</b>	Approximately 4.0 Ha.

### 2.2 Site Description

The site is located on the corner of the eastern side of Gipps Street and is bound to the north by the Great Western Highway and to south and east by Gipps Street. Prior to redevelopment the site comprised cleared vacant land and was previously used for rural residential and market garden purposes.

Detailed observations of each of the property is included in the RAP (EES 2022a) and are not reproduced following:

JBS&G completed a site inspection on 19 November 2024. At the time of the inspection the site was an active construction site with the following notable features:

- Access to the site for light vehicles was via a driveway from Putland Street on the eastern boundary of site. Access to the site for heavy vehicles / construction vehicles was via a driveway from Gipps Street on the southern boundary of site;
- An access road was present from the southern entry leading through the centre of the site to the north;
- An asphalt car park and site sheds are present along the eastern boundary of site;
- The majority of the site was used as laydown areas for storage of construction materials, plant and equipment. The laydown area in the south-eastern portion of site appeared to be natural material and was partially cut into the original soil profile, with the southern and western extents at the same level as the surrounding land. The laydown area in the south east of site was on concrete hardstand and the laydown area in the north of site appeared to be an imported gravel material;
- A water treatment plant was present at the northern boundary of the site;
- The shaft was present in the north western corner of the site;
- Two sediment ponds were present, located at the northern and north western (south of the shaft) boundaries of site; and



- Two “asbestos areas” were fenced off, located on the central western and central eastern boundaries of the site. The western area was covered with long grass and the eastern area was covered with Geofabric and long grass. These areas correlate to the locations of the asbestos identified, below the site assessment criteria, as discussed in **Section 4**.

## 2.3 Surrounding Land Use

Surrounding land-uses include:

- North: Great Western Highway with a reserve, Claremont Creek and Wollemi College beyond;
- East: Vegetated land, service station and McDonalds beyond;
- South: Gipps Street Recreational Precinct; and
- West: Gipps Street and residential properties beyond.

## 2.4 Site History

The DSI reports that the M2A (2020) report presented a high-level review of aerial imagery indicating that the predominant site use was for market gardens and pastureland with a small number of residential buildings and associated structures prior to 1955 and demolished between 1980 and 2000. Recent site uses appear to have been for road construction related activities with a construction compound, stockpile areas on the northern half of the site with two small sediment ponds.

Historic land titles supported the review of aerial images indicating that the site was privately owned between 1905 and 1974 when it was purchased by The Housing Commission of NSW before being transferred to The Land Commission of NSW. The site was purchased in 2012 by Roads and Maritime Services (now Transport for NSW).

## 2.5 Topography

EES (2022b) reports that the site is situated at elevations of 30 m Australian Height Datum (AHD) and slopes gently in a north-west direction towards Claremont Creek. The topographic variation across the site is approximately 4 m from south east to north west.

## 2.6 Geology

The DSI (EES 2022b) reports the Penrith 1:100,000 Geological Series Sheet 9030 (Clark & Jones, 1991) describes the lithology of the site and its immediate surroundings as Quaternary aged unconsolidated alluvial fine-grained sand, silt and clay Quaternary period underlain by the Triassic aged Bringelly Shale of the Wianamatta Group. Bringelly Shale is comprised of dark shale, rare coal, lithic sandstone, laminate and carbonaceous claystone.

## 2.7 Hydrology

TTMP (2022a) report there are no natural surface water features at the site. The nearest surface water receptor is Claremont Creek located approximately 130 m northwest of site, with South Creek located approximately 520 m east of the site.

The site’s surface is predominantly unsealed cleared land with low (grassy) vegetation, there is an area of compacted gravel in the central-eastern area of the site (refer Figure 2 of the DSI). It is anticipated that precipitation at the site would slowly infiltrate the soil profile with a degree of run-off due to the low porosity and permeability of the natural clay soils.

## 2.8 Hydrogeology

EES (2022a) report groundwater flow is anticipated to be toward South Creek, which is northeast from the site. Water-bearing units potentially comprise a shallow, unconfined systems and a deeper bedrock hosted system. The site soils potentially host a low yield, shallow unconfined alluvial aquifer likely to be present at the interface between soil and rock at about 3-7 m below ground level (bgl). A deeper groundwater system is potentially present within the bedrock, likely hosted by fractures/ joints or more permeably lithologies (e.g., sandstone more likely than claystone/ shale), although bedding planes may support some horizontal groundwater flow.

Groundwater velocity is anticipated to be very slow with low hydraulic conductivity, due to the low permeability and (primary) porosity of the site geology.

The nearest registered groundwater bores are located approximately 100 m east of the site, three bores were installed at the Ampol service station to 6 mbgl for monitoring purposes. No additional detail such as groundwater level was available.

### 3. Previous Investigations

The following previous reports were referred to in preparation of the RAP (EES 2022a):

- *Contamination Assessment Report, Sydney Metro Western Sydney Airport*, Cardno, 5 May 2021, Report reference: 80021888 (Cardno 2021a);
- *Contamination Assessment Report – Phase D/E, Sydney Metro Western Sydney Airport*, Cardno, 26th November 2021, Report reference: 80021888; RevB, (Cardno 2021b);
- *Factual Contamination Report – Preliminary Site Investigation*. Golder & Douglas Partners 19 Feb 2021, Ref: 19122621-003-R-Rev3; Rev3 (Golder-DP 2021);
- *Sydney Metro – Western Sydney Airport, Technical Paper 8: Contamination*. M2A Joint Venture (M2A) (2020) (M2A 2020);
- *Detailed Site Investigation Detailed Site Investigation for Claremont Meadows Services Facility*. Environmental Earth Sciences NSW (2022), 27 July 2022, Ref. 122045RP01V2, (EES 2022b), noting a more recent DSI has been provided to JBS&G dated 20 September 2022 (V3); and
- *Waste Classification and On-site Re-Use Assessment of Stockpiled Soil Material 1-17 Gipps Street, Claremont Meadows NSW*. EDP Consulting, 13 April 2022, Ref. S- 03958.WCC.001 V3, (EDP 2022).

Additionally, works have been completed to detail the remediation and validation of the site and provided to JBS&G, these reports include:

- *Data gap assessment for additional targeted investigation near the north boundary at the Claremont Meadows Services Facility – 1-17 Gipps St, Claremont Meadows NSW 2747*. Environmental Earth Sciences. 13 April 2023 (EES 20223a);
- *Hazardous Ground Gas Risk Assessment – Claremont Meadows Services Facility Road and Rail Excavations Pty Ltd*. Environmental Earth Sciences. 6 April 2023. Ref: 122045 Version 1 (EES 2023b);
- *Factual Gas Monitoring Report No.1 (June 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW*. Environmental Earth Sciences. 16 June 2023 (EES 2023c)
- *Factual Gas Monitoring Report No.2 (July 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW*. Environmental Earth Sciences. 14 July 2023 (EES 2023d)
- *Factual Gas Monitoring Report No.3 (August 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW*. Environmental Earth Sciences. 10 August 2023 (EES 2023e)
- *Factual Gas Monitoring Report No.4 (September 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW*. Environmental Earth Sciences. 14 September June 2023 (EES 2023f)
- *Factual Gas Monitoring Report No.5 (October 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW*. Environmental Earth Sciences. 12 October 2023 (EES 2023g)
- *Advice letter regarding cessation of landfill gas monitoring at Claremont Meadows*. Environmental Earth Sciences. 25 September 2023. Project number WSA-200-SBT, Document number SMWSASBT-CPG-OHE-SF150-EN-RPT-295321, Revision A (EES 2023h)
- *Asbestos Removal Control Plan – Claremont Meadows, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works*. Mann Group, 15/09/2022. Project number WSA-200-SBT. Document number SMWSASBT-CPG-SWD-SW000-HS-PLN-202100. Revision B (Mann Group 2022a)
- *Asbestos Removal Control Plan – Claremont Meadows, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works*. Mann Group, 25/10/2022. Project number WSA-200-SBT. Document number SMWSASBT-CPG-SWD-SW000-HS-PLN-202100. Revision 01 (Mann Group 2022b)

- *Clearance Certificate*. Airsafe. 14 June 2022. Project: 3 Gipps Street, Claremont Meadows. Job Number: 63146 (Airsafe 2022a)
- *Clearance Certificate*. Airsafe. 20 September 2022. Project: 19 Gipps Street, Claremont Meadows. Job Number: 63938 (Airsafe 2022b)
- *Clearance Certificate*. Airsafe. 09 November 2022. Project: 19 Gipps Street, Claremont Meadows. Job Number: 63938 (Airsafe 2022c)
- *In Situ Waste Classification of Material at the Claremont Meadows Services Facility – 1-17 Gipps St, Claremont Meadows NSW 2747*. Environmental Earth Sciences. 5 August 2022 (EES 2022d)
- *Materials Analysis & Classification Report, Putland Street and Gipps Street Claremont Meadows, 2747*. ADE Consulting Group. 9 September 2022. Project reference: A101022.0967.01. Report reference: MAC2-v1f. (ADE, 2022a)
- *Materials Analysis & Classification Report, Putland Street and Gipps Street Claremont Meadows, 2747*. ADE Consulting Group. 20 November 2024. Project reference: A101022.0967.01. Report reference: MAC6-v2f. (ADE, 2024)
- *Excavated Natural Material Assessment 23122, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works Claremont Station*. NEO Consulting. 21 August 2023. (NEO, 2023)
- *Waste Classification Report, P23122- Sydney Metro West, Gipps Street Claremont, Meadows NSW 2747*. NEO Consulting. 24 July 2024. (NEO, 2024)



## 4. Summary of Potential for Contamination

The DSI (EES 2022b) sample locations on the site are shown in **Figure 3** (based on Figure 1 of EES (2022d)) and a detailed summary of previous investigations is provided in the RAP (EES 2022a).

Key conclusions as summarised in the RAP are provided as **Section 4.1** and **4.2**.

### 4.1 Contamination

The RAP reports soil within the site poses a low risk of contamination to the project given that no gross contamination was identified within the site. The RAP states previous investigations identified that there is the potential for unexpected finds to be encountered during site works with investigation of two unexpected finds required as part of the validation works.

Previous investigations for the Project (Cardno, 2021a and 2021b and Golder-DP, 2021) completed a limited number of investigation locations at the CMSF site. A summary of investigation locations within the site is provided in the RAP (EES 2022a). All samples submitted from sample locations were reported below the adopted site assessment criteria considering a commercial/ industrial land-use scenario (Setting D) from ASC NEPM (2013).

EES completed a DSI for the site as documented in EES (2022b). The DSI reported all contaminants of potential concern (COPC) below the laboratory limit of reporting (LOR) or the adopted site assessment criteria considering a commercial/ industrial land-use scenario (Setting D) (NEPM, 2013). EES (2022b) reported two detections of asbestos in the form of friable asbestos (FA) (sample ID: TP15\_0.15, 0.0004% w/w) and asbestos fines (AF) (sample ID: TP207\_0.05, 0.00002 %w/w). The quantification of FA/ AF was reported below the adopted site screening levels for all land-use scenarios, was not detected in the deeper samples at respective locations and therefore not considered to present an unacceptable risk to site users/ workers. The DSI noted the presence of the identified asbestos for waste classification purposes should the material need to be excavated and disposed offsite.

Prior to the completion of the DSI (EES 2022b) a waste classification was completed for a stockpile on the western boundary of site by EDP (EDP 2022). The report classified a stockpile with a volume of approximately 1,100 m<sup>3</sup> as General Solid Waste – Special Waste (non-putrescible) in accordance with NSW EPA (2014) and was subsequently disposed from the site. JBS&G was provided with the clearance certificate for the stockpile footprint undertaken by Airsafe on 10 June 2022 (Airsafe, 2022a, provided in **Appendix C**). This clearance was a visual inspection, with no sampling of soils was undertaken. It is noted no details or receipts regarding the disposal facility were provided for review as the materials were disposed offsite prior to CPB taking ownership of the site, thus no comment can be made whether material was disposed offsite appropriately. It is noted that as part of the DSI (EES 2022b) sampling of the stockpile footprint was completed for validation purposes and no asbestos was detected above the site assessment criteria (as noted above asbestos as AF was reported in TP207\_0.05 below the site assessment criteria within the footprint of this stockpile).

## 4.2 Material / Waste Classification

*In Situ Waste Classification of Material at the Claremont Meadows Services Facility* (EES 2022d) (also reported in Section 13 of the DSI report) provides details of an insitu waste classification of materials at site. The provided waste classification is included as **Table 4.1** below and **Figure 3** (based on Figure 1 of EES (2022d)).

EES (2022d) reported the excavation of soils from the site was anticipated to result in an estimated ~4,800 m<sup>3</sup> (<5,000 m<sup>3</sup>) of surplus soils. Soils were chemically characterised to meet the classification of 'General Solid Waste' (Non putrescible), however due to the detection of asbestos at two locations (IDs: TP15 and TP207) material around these locations was further classified as 'Special Waste (Asbestos)'.

**Table 4.1: Waste classification process steps (EES 2022d)**

Material	Location	Depth	Classification
Fill material	All <sup>1</sup>	<0.5 m <sup>2</sup>	General solid waste (non-putrescible)
Fill material	TP15 and TP207 <sup>3</sup>	0.2 m	General solid waste (non-putrescible)/Special <sup>4</sup>
Natural	All	>0.5 m <sup>1</sup>	General solid waste (non-putrescible)/VENM

**Notes:**

1. Note material around TP15 and TP207 is excluded due the detection of friable asbestos – see Figure 7.
2. Deep fill was encountered in TP4 and TP5 to ~2.4 mBGL while at TP9 was ~0.9 mBGL and this should be considered and confirmed prior to material being removed as 'VENM'.
3. An area around TP15 and TP207 has been classified as 'special waste (Asbestos)' by considering the position of site investigation locations that were not reported to contain asbestos.
4. The extent of special waste (asbestos) should be validated prior issuing a clearance certificate to demonstrate appropriate management and removal of special waste (asbestos) – see Section 16 Recommendations (EES 2022d).

## 5. Site Management Strategy

### 5.1 Identified Data Gaps

EES (2022ba and 2022b) identified data gaps that required further assessment to determine that there were no unacceptable risks under the proposed use of the site for construction purposes under a commercial/ industrial land-use scenario (e.g. generic scenario 'D' from ASC NEPM., 2013), summarised as follows:

- Potential historic use of a small portion of the site, near the northern boundary, as a service station; and
- Potential hazardous ground gas migration beneath the site from the adjacent (off-site) former Gipps Street Landfill.

Actions to close out the above identified complete risk linkages are provided in **Section 5.1.1** and **5.1.2**.

#### 5.1.1 Potential Former Service Station Area

The RAP and DSI (EES 2022a and 2022b) identified an area near the northern boundary of the site that was potentially used as a service station between c. 1970 and c. 1985. Aerial imagery showed the potential forecourt was shaped with access and egress from Great Western Highway with a square shaped building located on the southern extent of the potential forecourt. The RAP reports upgrades to the Great Western Highway may mean the potential location of the alleged former service station may not be part of the current site.

The RAP required additional intrusive investigation to assess for residual impacts to underlying soils and determine if underground storage tanks are present. The estimated footprint of the data gap area is less than 0.1 Ha and therefore six intrusive assessment locations were required in accordance with NSW EPA (1995<sup>17</sup>). It is noted that NSW EPA (1995) were recently superseded. However the investigative work consisting of six locations was completed prior to the release of revised sampling design guidelines (NSW EPA 2022<sup>18</sup>).

The sampling program was designed to address the sources and exposure pathways identified in the conceptual site model (CSM) for this area of the site namely:

- Potential distribution of hydrocarbon fuels at the surface; and
- Bulk hydrocarbon storage below ground.

The greatest potential risk was associated with bulk hydrocarbon fuel storage below the ground surface within a UST farm (if any). SafeWork NSW could not determine if a license application was ever submitted for the storage of hazardous chemicals upon the premise. Considering that bulk hydrocarbon storage at the site (if any) was likely to commence c. 1970 and potentially for a relatively minor volume of fuels, it is considered unlikely that accurate records exist.

Intrusive assessment targeted potential indications of an abandoned or former UST farm, including backfilled pits, potentially residual accessories (e.g. distribution/ vent lines) or stained and odorous soils. A maximum assessment depth of 3.0 mbgl was undertaken, targeting the base of any potential former UST farms. An assessment of groundwater was not considered a requirement to address this data gap.

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<sup>17</sup> NSW Environmental Protection Authority (EPA) (1995) – *Sampling Design Guidelines (the "Sample Design Guidelines")*.

<sup>18</sup> NSW EPA (2022), *Contaminated Land Guidelines – Sampling design part 1 – application*

### 5.1.2 Potential Hazardous Ground Gas Migration

The RAP documents the requirement for a hazardous ground gas assessment to be completed in accordance with NSW EPA (2020<sup>19</sup>) *Contaminated land guidelines: Assessment and management of hazardous ground gas* adopting a staged approach of preliminary screening (desk study), risk classification and prioritisation, and risk analysis and assessment.

The preliminary screening should be completed first, considering the potential sources of hazardous ground gas. The results of which will determine whether further hazardous ground gas assessment is needed. If so, a sampling analysis and quality plan (SAQP) should be prepared for the assessment in accordance with the requirements of NSW EPA (2020 and 2022).

## 5.2 Site Management Strategy Overview

The results from the site-specific investigations (EES 2022b and EDP 2022) indicate that there is no need for immediate remediation as identified risks were considered acceptable, however the site investigations and history indicate that there is potential for unexpected finds, primarily asbestos/ ACM to be present within the sub-surface which is considered to be more likely in certain areas of the site, including where asbestos impacts were identified during sampling activities.

EES (2022b) reported two detections of asbestos one as AF (bonded fragments < 7mm in size, AF) and one as FA. Both these detections were quantified at the NATA accredited laboratory and report below the applicable health screen levels (HSL) for FA/ AF (0.001 %w/w) in soils for all site uses from ASC NEPM (2013).

The two areas where AF/ FA were identified have been summarised on **Figure 3** (based on Figure 1 of EES (2022d)) also presenting the areas on the site that are considered to have elevated potential for further asbestos/ ACM impacts.

Where remediation is required, the RAP considers the following remediation options / technologies as suitable in order of preference based on evaluation of regulatory acceptance, practicality, cost, timeframe and sustainability:

- Option 1 - Picking and treating of soils impacted with ACM (i.e., 'emu picking').
- Option 2 - Offsite disposal of impacted soils/ fill as waste.
- Option 3 - On-site encapsulation and management.
- Option 4 - Do nothing.

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<sup>19</sup> NSW EPA (2020), *Contaminated Land Guidelines: Assessment and management of hazardous ground gases*.

## 6. Validation Plan

### 6.1 Data Quality Objectives

Data quality objectives (DQOs) were developed for the validation assessment, as discussed in the following sections.

#### 6.1.1 State the Problem

The site is proposed to be developed into Claremont Meadows Service Facility as part of the SBT Works package (noting the future land use of the site is an intermediate service facility and not a future station) of the Sydney Metro Western Sydney Airport.

The site has historically been used as market gardens and pastureland with a small number of residential buildings and associated structures prior to 1955 and demolished between 1980 and 2000. Recent site uses appear to have been for road construction related activities with a construction compound, stockpile areas on the northern half of the site with two small sediment ponds.

Given the nature of the historical uses, whilst previous investigations had not identified the presence of widespread contamination issues, there remained the possibility that various smaller scale instances of contamination concern may be encountered during the site clearing program. In addition, it was required to ensure that material imported and exported from the site was appropriately documented to demonstrate compliance with NSW legislation and EPA guidance.

As such, a validation assessment was required to evaluate the implementation of the RAP and thereby demonstrate that compliance with the RAP has enabled drawing of conclusions confirming the suitability of the site for the proposed commercial/industrial land use.

#### 6.1.2 Identify the Decision

The following decisions are required to be made during the validation works:

- Have any identified data gaps at the site not been appropriately assessed in accordance with the RAP?
- Have any unexpected finds encountered at the site not been appropriately managed in accordance with the RAP?
- Are there any materials removed from the site that have not been appropriately characterised and disposed of during the development works?
- Has any imported material not been appropriately characterised to demonstrate it does not present an unacceptable risk in relation to the future site use?
- Have development works at the site been completed not in accordance with the requirements of the RAP?
- Are contaminant concentrations in soil remaining on site above the adopted validation criteria?
- Is the site suitable for the proposed use?

### 6.1.3 Identify Inputs to the Decision

The following inputs were required in order to make the stated decisions:

- Physical observations, including visual and olfactory results during site activities;
- Documentation to verify appropriate removal and disposal of waste;
- Documentation to verify suitability of material imported to the site;
- Soil and ground gas analytical data from data gap and validation sampling completed;
- The site soil validation acceptance criteria adopted for contaminants of concern with regard to the proposed land uses; and
- Confirmation that data generated by sampling and analysis are of an acceptable quality to allow reliable comparison by assessment of quality assurance / quality control as per the data quality indicators established in **Section 6.1.6**.

### 6.1.4 Site Boundaries

The boundary for the site is shown on **Figure 2** and is defined as Claremont Meadows Service Facility site on the survey included as **Appendix A**. The site is formally identified as part Lot 100 in DP1275138.

The vertical extent of the works was approximately 0.2 m (depth of unexpected find validation sampling program) below the site surface following site excavation / formation works.

As a result of the project objectives, the temporal study boundaries were limited to the period of assessment works completed between 27 July 2022 to 16 October 2024. Due to the nature of the potential contamination identified, seasonality is not considered to be significant with respect to assessing risks to future site receptors.

### 6.1.5 Decision Rule

Soil analytical data were assessed against EPA published / endorsed criteria for constituents:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013*, National Environment Protection Council, 2013 (2013);
- Contaminated Land Management Guidelines for the NSW Site Auditor Scheme 3rd Edition, October 2017 (NSW EPA 2017); and
- Waste Classification Guidelines. Part 1: Classifying Waste, NSW EPA, November 2014 (EPA 2014).

### 6.1.6 Summarise Decision Rules

The decision rules adopted to answer the decisions identified in **Section 6.1.2** are summarised in **Table 6.1**.

**Table 6.1: Summary Decision Rules**

Decision Required to be made	Decision Rule
1. Have any identified data gaps at the site not been appropriately managed in accordance with the RAP?	<p>Comparison of the RAP requirements with the scope of works completed to manage identified data gaps was undertaken on a qualitative basis. If the works completed were consistent with the RAP requirements, the answer to the decision was No.</p> <p>In the event works were not completed in accordance with the requirements, evaluation of the completed works in accordance with the objectives of the RAP was completed. If the works were completed in accordance with the RAP objectives, the answer was also No.</p> <p>Otherwise, the answer to the decision was Yes.</p>
2. Have any unexpected finds encountered at the site not been appropriately managed in accordance with the RAP?	<p>Comparison of the RAP requirements with the scope of works completed to manage unexpected finds encountered on the site was undertaken on a qualitative basis. If the works completed were consistent with the RAP requirements, the answer to the decision was No.</p> <p>In the event works were not completed in accordance with the requirements, evaluation of the completed works in accordance with the objectives of the RAP was completed. If the works were completed in accordance with the RAP objectives, the answer was also No.</p> <p>Otherwise, the answer to the decision was Yes.</p>
3. Are there any materials removed from the site that have not been appropriately characterised and disposed of during the development works?	<p>A qualitative assessment of material disposal records was completed following the completion of development works with respect to the waste classification.</p> <p>If the documentation was completed and appropriate, the answer to the decision was No.</p> <p>Otherwise, the answer to the decision was Yes.</p>
4. Has imported material not been appropriately characterised to demonstrate it does not present an unacceptable risk in relation to the future site use?	<p>Documentation was reviewed against requirements in the RAP in addition to comparison of soil analytical data against EPA endorsed criteria (where required).</p> <p>If concentrations were all less than the relevant adopted criterion, the answer to the decision was No.</p> <p>If the concentrations exceeded the adopted criterion for one or more analytes, the answer to the decision was Yes.</p>
5. Have development works at the site been completed not in accordance with the requirements of the RAP?	<p>Comparison of the RAP requirements with the completed scope of works was undertaken on a qualitative basis. If the works completed were consistent with the RAP requirements, the answer to the decision was No.</p> <p>In the event that works were not completed in accordance with the requirements, evaluation of the completed works in accordance with the objectives of the RAP was completed. If the works were completed in accordance with the RAP objectives, the answer to the decision was also No.</p> <p>Otherwise the answer to the decision was Yes.</p>
6. Are contaminant concentration in soil remaining on site above the adopted validation criteria?	<p>Soil analytical data was compared against EPA endorsed criteria as established in <b>Section 6.4</b> as validation criteria. For each validation data set, samples collected from consistent horizons, stratigraphy or material type with sufficient sample numbers were subject to statistical analysis in accordance with relevant guidance documents, as appropriate, to</p>



Decision Required to be made	Decision Rule
	<p>facilitate the decisions. The following statistical criteria were adopted with respect to each sample set:</p> <p>Either: the reported concentrations were all be below the site criteria;</p> <p>Or: the average site concentration for each analyte was below the adopted site criterion; no single analyte concentration exceeded 250% of the adopted site criterion; and the standard deviation of the results was less than 50% of the site criterion.</p> <p>And: the 95% upper confidence limit (UCL) of the average concentration for each analyte was below the site criterion.</p> <p>If the statistical criteria stated above were satisfied, the answer to the decision was No.</p> <p>If the statistical criteria were not satisfied, the answer to the decision was Yes.</p>
7. Is the site considered suitable for the proposed use?	<p>Was the answer to any of the above decisions Yes?</p> <p>If yes, a site management strategy may be required.</p> <p>If no, a site management strategy was not required and the site is considered suitable for the proposed land uses.</p>

## 6.2 Optimise the Design for Obtaining Data

The purpose of this step was to identify a resource-effective field investigation sampling design that generated data that were expected to satisfy the Site Manager's decision performance criteria, as specified in the preceding steps of the DQO Process. The output of this step was the sampling design that guided development of the field sampling and analysis plan. This step provided a general description of the activities necessary to generate and select data collection designs that satisfied decision performance criteria.

The assessment and subsequent laboratory analysis program as outlined in the following sections was implemented during site validation activities to demonstrate successful completion of works in compliance with the RAP (EES 2022a) goals and requirements.

## 6.3 Validation Methodology

As per the RAP (EES 2022a) validation of any site remediation works are required to demonstrate that the risk have been appropriately remediated or managed in accordance with relevant legislation, guidelines and Codes of Practice.

### 6.3.1 Soil Sampling

As required by the RAP (EES 2022a) to demonstrate that remediation has been completed and that there is no unacceptable risk to site users soil sampling may be required. Examples of scenarios where soil sampling is required are:

- Visibly stained/ odorous material was encountered and determine to be chemically contaminated such that a risk to site users/ workers (or the environment) existed and was remediated.
- FA/ AF impacted soil was identified and remediated.
- An incident occurred at the site, resulting in an uncontrolled release of chemicals (e.g., fuels and/ or lubricants) that impacted soils.
- Extensive bonded ACM impacts are identified within the sub-surface.

The sampling frequency will vary based upon the nature and extent of impacts with a higher frequency of sampling required where unacceptable asbestos impacts are identified. A general guide to validation sampling has been presented in **Table 6.2**.

**Table 6.2: Guidelines for validation soil sampling frequency**

Type of soil remediation	Base	Walls	Comments
Shallow excavations (<200 mm depth)	5 m by 5 m grid	N/A	Consider need to demonstrate appropriate lateral delineation of impacts (e.g. sampling outside of the excavation area).
Medium excavations (up to 1 m depth)	5 m by 5 m grid (see comments)	Linear: Every 5 m Vertically: Representative of contamination depth.	Consider safe access to excavations.
Deep excavations (> 1 mBGL)	5 m by 5 m grid (see comments)	Linear: Every 5 m Vertically: Representative of contamination depth.	Safe access to deep excavations will determine how validation can be completed. Mechanical excavation adjacent the excavation may be required

Note: Validation sampling of excavation walls where the depth is >200 mm should consider a minimum of one sample per wall.

## 6.4 Validation Criteria

### 6.4.1 Soil Criteria

As discussed in the RAP (EES, 2022a), the site is intended to be developed for commercial / industrial land use. As such, health-based criteria for a commercial / industrial use were adopted for site characterisation/validation.

Soil analytical results have been compared against published levels as presented in **Table 6.3**. The validation criteria are based on guidelines provided in NEPC (2013<sup>20</sup>):

- NEPM 2013 Health investigations levels (HIL);
- NEPM 2013 Health screening levels (HSL) Vapour Intrusion 0 to <1m, sand;
- NEPM 2013 Ecological Investigation Levels (EILs);
- NEPM 2013 Ecological Screening Levels (ESLs); and
- NEPM 2013 Management Limits Coarse.

Where sufficient data sets were available, statistical criteria as nominated following were applied:

Either:

- All contaminant concentrations were less than the adopted site assessment criteria,

Or:

- The upper 95% confidence limit on the average concentration each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) was below the adopted criterion;
- No single analyte concentration exceeded 250% of the adopted criterion; and
- The standard deviation of the results was less than 50% of the criterion.

<sup>20</sup> National Environmental Protection (Assessment of Site Contamination) Measure 1999, ('ASC NEPM') NEPC (2013)

**Table 6.3: Adopted Site Criteria**

	Limit of Reporting	Laboratory Method	Health Investigation/ Screening Levels Commercial / Industrial (HIL-D)
<b>METALS</b>			
Arsenic	2.0	ICP-AES (USEPA 200.7)	3000
Cadmium	0.4	ICP-AES (USEPA 200.7)	900
Chromium	5.0	ICP-AES (USEPA 200.7)	3600 <sup>1</sup>
Copper	5.0	ICP-AES (USEPA 200.7)	240000
Nickel	5.0	ICP-AES (USEPA 200.7)	6000
Lead	5.0	ICP-AES (USEPA 200.7)	1500
Zinc	5.0	ICP-AES (USEPA 200.7)	40000
Mercury (inorganic)	0.1	Cold Vapour ASS (USEPA 7471A)	730 <sup>2</sup>
<b>POLYCYCLIC AROMATIC HYDROCARBONS</b>			
Carcinogenic PAHs (as B(a)P TPE) <sup>3</sup>	0.5	GCMS (USEPA8270)	40
Naphthalene	0.5	Purge Trap-GCMS (USEPA8260)	NL
Total PAHs <sup>4</sup>	0.5	GCMS (USEPA8270)	4000
<b>BTEX</b>			
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	3 <sup>5</sup>
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	NL <sup>7</sup>
Ethylbenzene	1.0	Purge Trap-GCMS (USEPA8260)	NL <sup>7</sup>
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	230
<b>TOTAL RECOVERABLE HYDROCARBONS</b>			
F1 C <sub>6</sub> -C <sub>10</sub>	10	TRH Purge Trap-GCMS (USEPA8260)	230 <sup>6</sup>
F2 >C <sub>10</sub> -C <sub>16</sub>	50	TRH Purge Trap-GCMS (USEPA8260)	NL <sup>7</sup>
F3 >C <sub>16</sub> -C <sub>34</sub>	100	Purge Trap-GCFID (USEPA8000)	-
F4 >C <sub>34</sub> -C <sub>40</sub>	100	Purge Trap-GCFID (USEPA8000)	-
<b>ORGANOCHLORINE PESTICIDES</b>			
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	3600
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	45
Chlordane	0.1	GCECD (USEPA8140,8080)	530
Endrin	0.1	GCECD (USEPA8140,8080)	100
Heptachlor	0.1	GCECD (USEPA8140,8080)	50
HCB	0.1	GCECD (USEPA8140,8080)	80
Methoxychlor	0.1	GCECD (USEPA8140,8080)	2500
<b>OTHER</b>			
Bonded Asbestos	Presence	PLM / Dispersion Staining	0.05%
AF/FA	Presence	PLM / Dispersion Staining	0.001%
All forms of asbestos	Presence	PLM / Dispersion Staining	No visible ACM for surface soil (0 – 0.1 m bgs).

(1) Guideline values presented are for Chromium (VI) in absence of total Chromium values. Where total Chromium results are elevated, representative samples will be analysed for Chromium (VI).

- (2) Guideline values are for inorganic mercury. Where elevated mercury concentrations are encountered and/or site information suggests the potential presence of elemental mercury and/or methyl mercury, consideration of applicability would be needed.
- (3) Carcinogenic PAHs calculated as per Benzo(a)pyrene Toxicity Equivalent Factor requirements presented in NEPC (2013)
- (4) Total PAHs calculated as per requirements presented in NEPC (2013).
- (5) Soil Health Screening Levels for Vapour Intrusion: Sandy Soils. Values presented are those for 0 to <1 m bgs as the most conservative level.
- (6) Values for F1 C6-C9 are obtained by subtracting BTEX (Sum) from laboratory result for C6-C9 TRH.
- (7) NL = Non Limiting

The ecological criteria adopted for the site are shown in **Table 6.4**. For the subject site, the commercial / industrial EILs/ESLs were adopted. The ecological criteria are based on site-specific soil properties derived in the DSI (EES 2022b), consistent with NEPC (2013) guidelines.

**Table 6.4: Ecological Based Criteria**

Metals	Limit of Reporting	Laboratory Method	EIL / ESLs Commercial / Industrial
Arsenic	4.0	ICP-AES (USEPA 200.7)	160 <sup>1</sup>
Cadmium	0.4	ICP-AES (USEPA 200.7)	-
Chromium	1.0	ICP-AES (USEPA 200.7)	670 <sup>2</sup>
Chromium (VI)	1.0	Alkali leach colorimetric (APHA3500-Cr/USEAP3060A)	-
Copper	1.0	ICP-AES (USEPA 200.7)	260 <sup>2</sup>
Nickel	1.0	ICP-AES (USEPA 200.7)	210 <sup>2</sup>
Lead	1.0	ICP-AES (USEPA 200.7)	1800 <sup>3</sup>
Zinc	1.0	ICP-AES (USEPA 200.7)	630 <sup>2</sup>
Mercury (inorganic)	0.1	Cold Vapour ASS (USEPA 7471A)	-
<b>PAHs</b>			
Benzo(a)pyrene	0.5	GCMS (USEPA8270)	172 <sup>4</sup>
Naphthalene	0.1	GCMS (USEPA8270)	370 <sup>1</sup>
<b>BTEX</b>			
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	95
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	135
Ethylbenzene	1.0	Purge Trap-GCMS (USEPA8260)	185
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	95
<b>TRH</b>			
F1 C <sub>6</sub> -C <sub>10</sub>	10	TRH Purge Trap-GCMS (USEPA8260)	215
F2 >C <sub>10</sub> -C <sub>16</sub>	50	TRH Purge Trap-GCMS (USEPA8260)	170
F3 >C <sub>16</sub> -C <sub>34</sub>	100	Purge Trap-GCFID (USEPA8000)	2500
F4 >C <sub>34</sub> -C <sub>40</sub>	100	Purge Trap-GCFID (USEPA8000)	6600

Metals OCPs	Limit of Reporting	Laboratory Method	EIL / ESLs Commercial / Industrial
DDT	0.1	GCECD (USEPA8140,8080)	640 <sup>1</sup>

(1) Generic EIL adopted

(2) Site-specific derived EIL (using average CEC and pH)

(3) Generic ACL adopted

(4) Threshold adopted from CRC Care (2017) Technical Paper No.39

(5) Values for F1 C6-C9 are obtained by subtracting BTEX (Sum) from laboratory result for C6-C9 TRH.

(6) Value for Chromium (III) adopted for evaluation of total Chromium in the absence of known Chromium (VI) source.

#### 6.4.2 Cardno (2021c) specific re-use criteria

Where results of any validation sampling exceed the criteria detailed above, the criteria derived by the HHERA (Cardno, 2021c) could be considered to demonstrate that there is no unacceptable risk by identified exceedances under the specific scenario.

Section 6.2 Risk Characterisation – Human Health within Cardno (2021c) provides greater detail for various scenarios considered during the preparation of the HHERA along with specific re-use criteria.

Due to the complexity of the specific scenario evaluation and risk assessment process, it is not considered suitable to provide the criteria herein and the original reference (Cardno, 2021c) should be sourced and reviewed to assess the potential risks where Tier 1 criteria from ASC NEPM (2013) are exceeded.

#### 6.4.3 Application of Soil Criteria

For soil to be considered as validated (i.e., not posing an unacceptable risk) all reported concentrations must be below the applicable site validation criteria. Where results were found to be above the adopted criteria, then statistical analyses of the data in accordance with relevant guidance documents was undertaken, if appropriate. If the statistical results were below the site criteria, then the results were considered acceptable.

In addition, consideration was also given to the presence of odorous or discoloured soils (caused by contamination), and other aesthetic issues.

#### 6.4.4 Offsite Disposal Criteria

Contaminated soils requiring disposal off-site were assessed in accordance with:

- NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste* and NSW EPA (2016) *Addendum to the Waste Classification Guidelines (2014) – Part 1: classifying waste*.
- Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 – The excavated natural material order 2014, NSW Environment Protection Authority (EPA 2014).
- Virgin Excavated Natural Material (VENM) as defined in *Protection of Environment and Operations (POEO) Act 1997*.
- Material classified under a Resource Recovery Order (RRO) and Resource Recovery Exception (RRE).

#### 6.4.5 Imported Soil Criteria

In accordance with the RAP (EES 2022a) prior to material being imported to the site, the suitability of the material was required to be confirmed. The following approvals process was implemented:

- Has appropriate documentation (e.g. VENM certificate) from the generating facility location been supplied and reviewed prior to material arriving at the site?
- If required, has the supplied documentation provided a site history, the results of any chemical characterisation with appropriate consideration of potential likely CoPC and sampled at an appropriate frequency?
- Have appropriate descriptions of material being supplied and has an inspection been completed to confirm material is as described?

Any material imported to the site was required to be must be fit for purpose and inclusive of VENM, ENM or otherwise material imported under a RRO and RRE. Material imported under a RRO and RRE required to meet the specifications and requirements including the reporting and record keeping requirements as stipulated within the RRO and RRE documentation.

Upon arrival at the site, any uncertainty as to the suitability of the material was to be assessed via confirmatory sampling and analysis to determine it is suitable to be beneficially re-used at the site. if any uncertainty exists as to the provenance of material imported to the site, the material should be segregated and assessed (both visually and chemically) before being used for any purpose on-site. Material that is considered unsuitable or not as described should not be allowed to be re-use on-site and should be removed either to the supplying/ generating facility or a suitable licensed waste disposal facility.

Where necessary, samples were to be collected and analysed at a minimum of 1 sample per 25 m<sup>3</sup> of material, however for larger volumes (e.g. >200 m<sup>3</sup>) it may be appropriate to utilise a statistic based approach where 1 sample per 250 m<sup>3</sup> and calculation of 95% upper confidence limits of the arithmetic mean could be used to demonstrate material is suitable.

The minimum recommended analytical suite for material being imported to site is:

- Priority heavy metals/ metalloids (As, Cd, Cr TOTAL, Cu, Hg, Ni, Pb and Zn).
- Total recoverable hydrocarbons (TRH) – (ASC NEPM 2013 fractions).
- Benzene, toluene, ethylbenzene and total xylenes (BTEX).
- Polycyclic aromatic hydrocarbons (PAH).
- Asbestos (in accordance with ASC NEPM 2013 requirements).

Records were required to be retained for all material imported to the site including at a minimum:

- Time and date.
- Registration of vehicles used to import material.
- Originating site.
- Weight/ Volume of material.
- Details of material classification (i.e., VENM/ ENM or under RRO and RRE).
- Description of material and location of use.

## 7. Validation and Characterisation Results

### 7.1 Unexpected Finds

Unexpected contamination, if identified during future works, was to be managed through implementation of the CPBG Contamination and Pass Management Procedure included as Appendix A of the RAP (EES, 2022a).

CBPBG-JV advised two unexpected finds were encountered or identified during the site works. A figure showing the approximate location of the unexpected finds is included as **Figure 4**. The management of the unexpected find is summarised as follows:

- North Area CMSF:
  - An Asbestos Removal Control Plan (ACRP) (Mann Group, 2022a) was prepared following the identification of asbestos contamination on the ground surface in the northern portion of site during the earthworks. The asbestos impacts were reported to be non-friable (bonded);
  - Mann Group conducted a visual assessment of the area prior to the commencement of works at which point the extent of impact was identified;
  - The asbestos impact was removed by Mann Group (Class A Asbestos Removal Licence SafeWork NSW Licence No AD212715, noting Auswide Operations Pty Ltd hold the licence but are trading as Mann Group) on the 19 and 20 September 2022;
  - A clearance inspection was undertaken by Airsafe on 20 September 2022 (Airsafe, 2022b). The clearance inspection included a visual inspection of the area with no asbestos observed on the surface. It is noted no sampling was undertaken for validation purposes;
  - Air monitoring for removal works was undertaken by Airsafe on 19 and 20 September 2022 and reported concentrations less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)]; and
  - Materials were classified insitu as per the Waste Classification provided as Appendix 1 of the ARCP which classified 30 m<sup>3</sup> of material as general solid waste (non-putrescible) special waste (asbestos waste) and were disposed offsite as documented in **Section 9**. The material was removed from site on 19 and 20 September 2022 and clearance was completed on 20 Sep 2022. The assessment for material was completed insitu (not as a stockpile), and materials were directly loaded offsite, with the validation of any interim stockpile location covered by the clearance inspection completed by Airsafe on the 20 September 2022.
- Car Park Area CMSF:
  - As discussed in **Section 4**, the DSI identified two areas with FA and AF detections (sample ID: TP15\_0.15 with a concentration of 0.0004% w/w and TP207\_0.05 with a concentration of 0.00002 %w/w) below the site assessment criteria. Considering the result met the site assessment criteria, the RAP did not require these two areas to be remediated, however, considered the likelihood of unexpected finds in the vicinity of the areas to be higher and included the locations for waste classification purposes. These two areas were generally not required to be disturbed as part of the site works with the exception of a portion of the area in the vicinity of TP15 in the central eastern portion of site for construction of a car park;
  - An Asbestos Removal Control Plan (Mann Group, 2022b) was prepared for the removal of soil for construction of the car park with soils considered to be asbestos impacted as a conservative measure. The extent of impact was initially defined by the area indicated as potentially impacted with asbestos (noted to be below the site assessment criteria) as per the DSI and RAP, which was confirmed visually during the removal works;



- The asbestos impact was removed by Mann Group (Class A Asbestos Removal Licence SafeWork NSW Licence No AD212715, noting Auswide Operations Pty Ltd hold the licence but are trading as Mann Group) on the 4, 5 and 7 November 2022;
- A clearance inspection was undertaken by Airsafe on 7 November 2022 (Airsafe, 2022c). The clearance inspection included a visual inspection of the area, collection of four soil samples for asbestos analysis and clearance of the decontamination unit. Airsafe reported soil samples found no asbestos at the reporting limit of 0.1g/kg. It is noted, the report (Airsafe 2022c) notes that *“Friable asbestos soil remains in-situ adjacent to the removal area. This material is grassed and has been encapsulated with a non-woven geotextile fabric separating layer. This material will be removed at a later date.”*, however this is referring to the detection of friable asbestos below the site assessment criteria (DSI, EES 2022b). Considering this area is being left insitu, and the area met the site assessment criteria and is therefore not considered to represent an unacceptable risk to site users/ workers, no further management is required as per the requirements of the RAP;
- Air monitoring for removal works was undertaken by Airsafe on 4, 5 and 7 November 2022 and reported concentrations less than the reporting limit of 0.01 fibres/mL for control and exposure monitoring as stated in the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)]; and
- Materials were classified in situ as per Appendix 1 of the ARCP which classified 58 m<sup>3</sup> of material as general solid waste (non-putrescible) special waste (asbestos waste) and were disposed offsite as documented in **Section 9**. The material was removed from site on 4, 5 and 7 November 2022 and a clearance completed on 7 November 2022. The assessment for material was completed insitu (not as a stockpile), and materials were directly loaded offsite, with the validation of any interim stockpile location covered by the clearance inspection completed by Airsafe on the 7 November 2022.

Based on the above, the unexpected finds are considered to have been appropriately managed in accordance with the requirements of the RAP. ARCPs are provided as **Appendix B**, clearance certificates (including photographs) are provided as **Appendix C**, waste classifications are provided as **Appendix D** and air monitoring results are provided as **Appendix E**.

## 7.2 Data Gap Assessments

### 7.2.1 Potential Former Service Station Area

EES (2023a) documents the data gap assessment (DGA) completed to assess potential risks associated with a potential historic use as a service station at the northern boundary of site. The DGA (EES 2023a) is included as **Appendix F**.

The DGA included the following scope of work:

- Advancement of six boreholes to a maximum depth of 3.0 m bgs, targeting the base of potential historic underground storage tanks (USTs);
- Collection of soil samples from pre-determined intervals (0-0.1 m bgs, 0.5 m bgs, 1 m bgs and every 1 m bgs thereafter). Soil headspace readings were screened in the field for the presence of ionisable volatile organic compounds (VOCs) using a calibrated photo-ionisation detector (PID); and
- Select soil samples were analysed for metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH) and asbestos (presence/absence). Asbestos quantification analysis for asbestos containing materials (ACM) (10 L samples) and asbestos fines/fibrous asbestos (AF/FA) (500 mL samples) was completed on select samples.

The DGA reported the following key findings based on the completed soil investigation:

- Concentration of COPC were generally reported below the laboratory LOR and/or the adopted human health and ecological criteria for a commercial/industrial land use setting provided in NEPM (2013). Asbestos as AF was identified in one sample (BH6\_0.2) at a concentration of 0.00005% w/w, below the adopted human health screening level (0.001% w/w); and
- EES concluded that based upon results and findings from this assessment, there is no unacceptable risk to human health or the environment for ongoing commercial / industrial land use (Setting D) due to the alleged former service station. As such additional assessment and/ or remediation is not considered necessary.

### 7.2.2 Potential Hazardous Ground Gas Migration

EES (2023b) documents the Hazardous Ground Gas Risk Assessment (HGGRA) completed to assess risks posed by potential hazardous ground gases to aboveground construction workers on the CMSF site during development of the shaft, as well as to address data gaps identified during the detailed site investigation (DSI, EES, 2022b).

The HGGRA included the following scope of work:

- Installation of four soil gas boreholes (GBH1 to GBH4) to maximum depths of approximately 4.15 mbgs along the southern boundary of the site, closest to the offsite former Gipps Street landfill;
- Hazardous ground gas monitoring was undertaken in one location (GBH1) using a Ambisense GasFlux monitoring system. From the 16 January 2023, the system recorded concentrations of gases (methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulfide), barometric pressure and borehole flow at approximately 1-hour intervals for a period of 30 days; and
- Two existing groundwater wells (SM-WSA-BH-A365 and GW-1028) were sampled for dissolved gases C<sub>1</sub>–C<sub>4</sub> (methane, ethene, ethane, propene, propane, butene, butane).

The HGGRA reported the following key findings during the monitoring period:

- Results from the Ambisense GasFlux unit at GBH1 indicated that low concentrations of methane were present with a peak concentration of 0.06 % volume/ volume (% v/v) and carbon dioxide was present with peak readings of 20.9% v/v;
- Barometric pumping effects were observed in response to atmospheric pressure changes. Under this effect, the concentration of carbon dioxide increased during decreasing atmospheric pressure while oxygen concentrations decreased. Conversely this was reversed during increasing atmospheric pressure, which also appeared to result in negative flows; and
- EES calculated gas screening values (GSV) in accordance with the methodology outlined in NSW EPA (2020b). The calculated GSV value for the assessment at GBH1 utilised the peak flow, methane, and carbon dioxide concentrations from the Ambisense GasFlux data and determined a site wide characteristic situation (CS). EES calculated a site wide GSV of 0.073 L/hr and a Characteristic Situation (CS) of 2 – 'low risk'. As the concentrations of carbon dioxide exceeding 5% v/v, it is considered that a CS – 'low risk' is appropriate for the site.

Based on the results of the hazardous ground gas assessment, EES (2023b) concluded that the potential risk to aboveground site workers posed by the former Gipps Street landfill is low and acceptable without the need for gas protection measures.

The HGGRA recommended that regular HGG monitoring be undertaken at the four gas bores (GBH1 to GBH4), with the start of the monitoring to coincide with the commencement of dewatering on the site and continue through to one month past the conclusion of dewatering.

EES recommended that the frequency of monitoring events should initially be set to monthly, however this frequency may vary following assessment of the monitoring data. EES noted that, should results indicate an increase in risk beyond the identified 'CS2', the monitoring frequency may be increased in order to capture sufficient data to confirm the change in characteristic situation. Additionally, EES noted that further assessment or remediation/management must be considered (including consideration of gas protection measures) if the CS increases in response to changes in either gas concentrations, flow or potentially both.

Monthly HGG monitoring was completed by EES starting in June 2023, and with the last round completed in October 2023 (EES 2023c, 2023d, 2023e, 2023f and 2023g). At each monitoring event sub-surface gas monitoring was conducted at all four existing gas bores (ID: GBH1 – GBH4) using a calibrated GA5000 landfill gas analyser (LGA).

Following the monthly monitoring from June 2023 to October 2023, EES was provided with two reports prepared by Douglas Partners Pty Ltd for Penrith City Council in relation to the former landfill (DP 2021<sup>21</sup> and 2022<sup>22</sup>), noting JBS&G was not provided with these reports. Based on these reports EES prepared *Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF)* (EES, 2023h) which determined the cessation of the land fill gas monitoring was appropriate based on the following:

- *"the explosion risk posed by methane concentration is very low (and acceptable) on the basis that methane concentrations have been very low and stable for the past six years*
- *the inhalation/ asphyxiation risk posed by carbon dioxide accumulation is also considered to be low and acceptable. Although the carbon dioxide concentrations are greater than 5%, the carbon dioxide appears to be due to natural processes/ conditions rather than due to landfill gas migration as carbon dioxide conditions are higher outside the landfill than within. Potential risks of carbon dioxide accumulation, though considered minor, could easily be managed/ monitored using confined space protocols."*

The HGGRA (EES 2023b), monthly factual HGG monitoring reports (EES 2023c, 2023d, 2023e, 2023f and 2023g) and the *Advice letter regarding cessation of landfill gas monitoring at Claremont Meadows Services Facility (CMSF)* (EES 2023h) are included as **Appendix G**.

### 7.3 Stockpile Assessments

Material generated from earthworks as surplus to site requirements was stockpiled. Stockpiled materials were then assessed for site reuse or offsite disposal, depending on the client request. Assessments were completed to determine suitability for reuse onsite or for waste classification for offsite disposal.

A materials tracking summary table is included in **Appendix H**, which provides a register of assessed stockpiles / in-situ materials and the final fate of materials (placement / current location at the site or offsite disposal). Assessment / waste classification reports are provided in **Appendix D** as undertaken to characterise the stockpiles. A summary of material disposed offsite is provided in **Section 9**.

A summary of the stockpile assessments and management is as follows:

- *Materials Analysis & Classification Report, Putland Street and Gipps Street Claremont Meadows, 2747. ADE Consulting Group. 9 September 2022. Project reference: A101022.0967.01. Report reference: MAC2-v1f. (ADE, 2022a):* The stockpile volume was 1000 m<sup>2</sup> and was reported to be sourced from multiple excavation works within fill material (0-0.5m below ground level) from various areas within the Claremont Meadow site. The stockpile was sampled on 2 September 2022 and classified in

<sup>21</sup> *Ground Gas Monitoring and Assessment, Proposed Recreational Development, Gipps Street, Claremont Meadows, NSW, Douglas Partners, 25 March 2021 (DP 2021)*

<sup>22</sup> *Additional Ground Gas Investigation Works, Proposed Recreational Development, Gipps Street, Claremont Meadows, Douglas Partners, 8 July 2022 (DP 2022)*

accordance with the Great River Excavated Material Order 2021 ('Great River Order') for Beneficial Offsite Re-use, however the material was reused on site for temporary works and earthworks for slabs.

- Materials Analysis & Classification Report, Putland Street and Gipps Street Claremont Meadows, 2747. ADE Consulting Group. 20 November 2024. Project reference: A101022.0967.01. Report reference: MAC6-v2f. (ADE, 2024): The stockpile volume was 750 m<sup>3</sup> and the reported source was alluvium material which had been sourced from multiple excavation works from various areas within the Claremont Meadow site. The stockpile was sampled on the 27 September 2022 and the results were reported to meet the NEPM HIL-D for commercial/ industrial land use site assessment criteria, based on advice from the client that the intention is to re-use the material within the St Mary's site (future commercial/industrial land use). The assessment included the completion of asbestos 10 L screen at each sample location, with no ACM identified. ADE reported consideration of the aesthetic value of the material, noting the minor identification of concrete within the material, should be taken when placing the material onsite so concrete fragments are not present on the soil surface. The stockpile was reused onsite for earthworks fill for slabs.
- Excavated Natural Material Assessment 23122, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works Claremont Station. NEO Consulting. 21 August 2023. (NEO, 2023): The stockpile volume was 1790 m<sup>3</sup> and the reported source was sandstone crane pad and the piling spoil made up of shale. The stockpile was sampled on the 16 August 2023 and classified as ENM (Excavated Natural Material). The materials were disposed offsite with further information provided in **Section 9**.
- Waste Classification Report, P23122- Sydney Metro West, Gipps Street Claremont, Meadows NSW 2747. NEO Consulting. 24 July 2024. (NEO, 2024): The stockpile volume was 1000 m<sup>3</sup> and sourced from the excavation of cross passages, a mixture of that material and other building materials. The stockpile was sampled on the 10 July 2024 and was classified as General Solid Waste. The materials were disposed offsite with further information provided in **Section 9**.

## 8. Material Disposed Offsite

The following materials were disposed offsite:

- 304 tonnes of impacted soils were disposed offsite as Special (Asbestos) mixed with General Solid Waste in accordance with the *Waste Classification Guidelines* (NSW EPA 2014) to Bingo Eastern Creek Recycling Ecology Park (and Landfill) located at 1 Kangaroo Avenue, Eastern Creek, NSW (Environmental Protection Licence (EPL) 13426) between 19 September and 7 November 2022. This includes the 88 m<sup>3</sup> of general solid waste (non-putrescible) special waste (asbestos waste) materials classified by waste classifications for the two unexpected finds (further information provided in **Section 7.1**);
- 2371 tonnes of soils were disposed offsite as General Solid Waste (non putrescible) in accordance with the *Waste Classification Guidelines* (NSW EPA 2014) to Brandown Waste and Recycling Pty - 37 Lee Holmes Drive St Marys (EPL 5857) on the 24 July and 25 July 2024. This includes the 1000 m<sup>3</sup> of general solid waste materials classified by NEO (2024) (**Section 7.3**);
- 9,724 tonnes of material were disposed offsite as ENM, in accordance with the *Waste Classification Guidelines* (NSW EPA 2014) to the following sites, this includes the 1790 m<sup>3</sup> of ENM classified by NEO (2023) (**Section 7.3**):
  - 1,644 tonnes were disposed to the property located at Nepean Business Park, Penrith (the Great River development located at 14-98 Old Castlereagh Road, Penrith NSW);
  - 1,023 tonnes were disposed to the property located at AWJ Kemps Creek, 657-769 Mamre Road, Kemps Creek; and
  - 7,057 tonnes were disposed to the SBT Works FS01, 560 Badgerys Creek Road, Badgerys Creek under the CPB *Material Import Form (MIF) – Northern Tunnelling Package* (CPB, 2023<sup>23</sup>).
- 35,410 tonnes of natural material were disposed offsite as VENM, in accordance with the *Waste Classification Guidelines* (NSW EPA 2014) to the following sites:
  - 24,797 tonnes to the property located at Nepean Business Park (NBP), Old Castlereagh Road, Penrith 2759 (Lot 1 DP 1263486, Portion of Lot 1 DP 2223, Lot 2 DP 1263486, Lot 3 DP 1263486). It is noted that 5,408 tonnes of material disposed to NBP is documented as GSW (general solid waste) on dockets and in the export register. This material was VENM, although was documented as GSW as VENM is pre-classified as GSW under the *Waste Classification Guidelines* (NSW EPA 2014);
  - 175 tonnes were disposed to the property located at AWJ Kemps Creek, 657-769 Mamre Road, Kemps Creek (Lot 34 DP 1118173, Lot X DP 421633, Lot 1 DP 1018318, Lot Y DP 421633, Lot 22 DP 258414);
  - 6,925 tonnes were disposed to the property located at PCC Sport Centre, 31 Gipps St Recreational Precinct; and
  - 3,513 tonnes were disposed to the SBT Works FS01, 560 Badgerys Creek Road, Badgerys Creek under the CPB *Material Import Form (MIF) – Northern Tunnelling Package* (CPB, 2023<sup>24</sup>).

<sup>23</sup> Material Import Form (MIF) – Northern Tunnelling Package, Project Number: WSA-200-SBT, Document Number: SMWSASBT-CPG-ATL-SF350-EN-RCD-257267, Dated: 21/11/2023, Revisions: A.02 CPBG (CPBG, 2023)

<sup>24</sup> Material Import Form (MIF) – Northern Tunnelling Package, Project Number: WSA-200-SBT, Document Number: SMWSASBT-CPG-ATL-SF350-EN-RCD-257267, Dated: 21/11/2023, Revisions: A.02 CPBG (CPBG, 2023)

The following materials were disposed offsite as sourced from the demolition of the site structures:

- 3,332 tonnes of concrete, pre-classified as GSW as per Step 3 of the *Waste Classification Guidelines* (NSW EPA 2014), was disposed to:
  - 2,310 tonnes to Brandown Waste and Recycling Pty - 37 Lee Holmes Drive St Marys (EPL 5857); and
  - 1,022 tonnes to Boral Recycling Pty Limited, 39A Widemere Road, Wetherill Park, NSW (EPL 11815).

Waste materials were appropriately classified in accordance with the Waste Classification Guidelines (EPA 2014) and in accordance with the RAP (EES 2022a). All waste tracking documentation including disposal dockets were maintained by CBPG-JV and was provided to JBS&G for inclusion in the validation report. A material tracking register is provided in **Appendix I**, available waste disposal dockets and NSW EPA WasteLocate consignment dockets (where required) are provided in **Appendix J**, waste classifications are provided in **Appendix D**, and ENM/VENM receiving sites documentation are provided in **Appendix K**.

JBS&G were advised the Nepean Business Park weighbridge was not operational between 14/09/2022 and 11/11/2022, and 21/09/2023 and 11/09/2023, therefore there are no disposal dockets are available for these periods.

## 9. Imported Materials Tracking

Materials were imported to Claremont Meadows Service Facility as part of the site preparation operations. Details of the materials imported, the approximate quantities and their original (source site) location are all included in the material import register included as **Appendix I**.

A summary of materials imported to the site is presented in **Table 9.1** below. Material classification / characterisation documentation is included as **Appendix L** and import material dockets are included as **Appendix M**.

The importation of materials to the site was managed through CPBG-JV's internal 'Material Reuse and Importation Procedure' included as **Appendix N**. Although the importation requirements detailed in the RAP (TTMP 2022a) were not strictly followed, the implemented procedure is considered appropriate for determining the suitability of the materials brought to site. Management of material importation as per the CPBG-JV procedures included:

- Confirmation the material is sourced from a quarry with an appropriate EPL, classified as either VENM or ENM, or supplied in accordance with an NSW EPA Resource Recovery Order / Resource Recovery Exemption (RRO/RRE);
- Review of supplier documentation by the CPBG Environmental Coordinator (EC) for review;
- EC to assess (through visual inspection, sampling and analysis) the material during import; and
- CPBG-JV visually inspect the material (including quarried VENM) during import and placement to confirm that the material is commensurate with that described in the supplier documentation.

CPBG-JV reported that the procedure was undertaken as per the above requirements and no issues were identified. There were no materials rejected based on the import assessment process.

**Table 9.1: Imported Materials Summary**

Material Type	Site Placement	Volume (tonnes)	Source	Details
VENM (Sandstone, SMZ)	Crane Pad, Haul Road	5,065	Elford Group Badgerys Creek, 320 Badgerys Creek Road, Badgerys Creek NSW	Elford's 'sandstone' is sourced from multiple tunnelling projects/ development sites and then temporarily stored at their facility in Badgerys Creek prior to being transported to the relevant SBT site. As such, all of the dockets reference 'Badgerys Creek'. The material was sourced from WestConnex Stage 3B M4 M5 Rozelle (EPL621278), included in <b>Appendix L</b>
VENM (Shale)	Temporary XP Ramps	57	ATL Badgerys Creek, Southern tunnel Spoil generated from Airport Business Park to Aerotropolis (only VENM)	CPBG Material Importation checklist included in <b>Appendix L</b>



Material Type	Site Placement	Volume (tonnes)	Source	Details
Tunnelling Material	Cross passage tunnels	2,721	SBT Orchard Hills	Imported under the SBT Claremont Meadows and Orchard Hills EPL 21672 included in <b>Appendix L</b>
Recovered Aggregate (DGB20)	Site establishment	1,571	ECORR, Eco Resource Recovery, 155 Newton Rd, Wetherill Park	Recovered aggregate test documentation included in <b>Appendix L</b>
Recovered Aggregate (DGB20)	Office Pad	2,243	Boral Recycling Windemere Rd, Wetherill Park	Recovered aggregate test documentation included in <b>Appendix L</b>
Recycled Roadbase (40DGS)	Site establishment	290	ECORR, Eco Resource Recovery, 155 Newton Rd, Wetherill Park	Recovered aggregate test documentation included in <b>Appendix L</b>

CPBG-JV note that the tunnel spoil imported to site did not include tunnel spoil from chainages 18,000 to 17,300 near St Marys, approximate Chainages 22,100 to 22,700 near Orchard Hills, and approximate Chainages 19,950 to 19,975 near Claremont Meadows. The import of tunnelling spoil to Claremont Meadows Service Facility occurred in accordance with the Sydney Metro Western Sydney Airport tunnelling material order 2023.

Based on the information and data collected, all materials imported to Claremont Meadows Service Facility to date meet the onsite reuse criteria and are deemed suitable for the intended land use.

## 10. Site Characterisation

As stated in **Section 6** validation data is required to be collected to verify the final site conditions are suitable for the intended land use. **Section 6.1.6** provides the decision rules applicable to assessing whether the site has been appropriately validated. Discussion of each of these points is provided in the following sections.

### 10.1 Have any identified remediation areas at the site not been appropriately managed in accordance with the RAP?

The RAP (EES 2022a) reported soil within the site poses a low risk of contamination to the project given that no gross contamination was identified within the site. The RAP states previous investigations identified that there is the potential for unexpected finds to be encountered during site works with subsequent investigation of unexpected finds required as part of the validation works.

It is noted asbestos, as friable asbestos, was identified in two locations at the site below the site assessment criteria, these detects therefore do not represent an unacceptable risk and do not require remediation.

Additionally assessment was undertaken of two data gaps as identified during the completion of the works. This is discussed in **Section 7.2**, with the outcomes summarised below:

- EES completed an assessment of the potential former service station in the northern portion of site (EES 2023a)), concluding that based upon results and findings of the assessment, there is no unacceptable risk to human health or the environment for ongoing commercial / industrial land use. As such additional assessment and/ or remediation was not considered necessary.
- EES (2023b) documents the HGGRA completed to assess risks posed by potential hazardous ground gases to aboveground construction workers on the CMSF site during development of the shaft, as well as to address data gaps identified during the DSI. Based on the results of the hazardous ground gas assessment, EES (2023b) concluded that the potential risk to aboveground site workers posed by the former Gipps Street landfill is low and acceptable without the need for gas protection measures.

Monthly HGG monitoring was completed by EES starting in June 2023, and with the last round completed in October 2023 (EES 2023c, 2023d, 2023e, 2023f and 2023g). Following the monthly monitoring from June 2023 to October 2023, EES was provided with two reports prepared by Douglas Partners Pty Ltd for Penrith City Council in relation to the former landfill (DP 2021 and 2022). Based on these reports EES prepared *Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF)* (EES, 2023h) which determined the cessation of the landfill gas monitoring was appropriate.

The implementation of the validation requirements is discussed further with respect to the other decisions.

### 10.2 Have any unexpected finds encountered at the site not been appropriately managed in accordance with the UFP?

As documented in **Section 7.1**, two unexpected finds were identified and required management to address site contamination risks during earthworks within the site boundary. Validation of the unexpected finds was generally completed in accordance with the RAP (EES 2022a).

### **10.3 Are there any materials removed from the site that have not been appropriately characterised and disposed of during the development works?**

A qualitative assessment of material disposal records was undertaken following completion of earthworks with respect to the waste classification documentation.

Prior to the completion of the DSI (EES 2022b) a waste classification was completed for a stockpile on the western boundary of site by EDP (EDP 2022). The report classified a stockpile with a volume of approximated 1,100 m<sup>3</sup> as General Solid Waste – Special Waste (non-putrescible) in accordance with NSW EPA (2014) and was subsequently disposed from the site. JBS&G was provided with the clearance certificate for the stockpile footprint undertaken by Airsafe on 10 June 2022 (Airsafe, 2022a, provided in **Appendix C**). This clearance was a visual inspection, with no sampling of soils undertaken. It is noted no details or receipts regarding the disposal facility were provided for review as the materials were disposed offsite prior to CPB taking ownership of the site, thus no comment can be made whether material was disposed offsite appropriately. It is noted that as part of the DSI (EES 2022b) sampling of the stockpile footprint was completed for validation purposes and no asbestos was detected above the site assessment criteria (as noted above asbestos as AF was reported in TP207\_0.05 below the site assessment criteria within the footprint of this stockpile).

Generally, there were no inconsistencies within the offsite disposal records provided by the principal contractor with respect to the material classifications (i.e. VENM classification) provided as part of the works. On this basis, it is considered that waste material removed from site has been appropriately characterised and transported to a lawful receiving facility.

### **10.4 Has imported material not been appropriately characterised to demonstrate it does not present an unacceptable risk in relation to the future site use?**

Review of provided material characterisation documentation was completed and it was identified all imported material was suitable to be applied to the site based on the provided documentation compliant with the RAP requirements.

### **10.5 Have development works at the site been completed not in accordance with the requirements of the RAP?**

A qualitative assessment of management of material tracking was undertaken with respect to procedures documented in the RAP (EES 2022a). The development works were completed in general accordance with the RAP.

### **10.6 Are contaminant concentrations in soil remaining on site above the adopted validation criteria?**

Appropriate characterisation/validation sampling events were generally undertaken for all identified areas of concern as required under the RAP. Soil analytical data for all validation and characterisation sampling (**Section 7**) were reported to have concentrations of contaminants below the adopted site validation criteria (**Section 6.4**). Based on the validation outcomes, there are considered to not be any outstanding issues associated with site contamination and/or aesthetic issues at the site.

### **10.7 Is the site considered suitable for the proposed use?**

No residual contamination or aesthetic issues have been identified within material retained at the Claremont Meadows site area. Waste disposal records are available which confirm the removal of known asbestos contaminated soils has occurred from the site. There is no evidence of importation of material which may be considered to be a potential source of contamination on the site.

## 11. Conclusions

Based on the findings of the previous investigations and this validation assessment, and subject to the limitations in **Section 12**, it is considered that the development works were completed in general accordance with the RAP (EES, 2022a). There is considered to be sufficient information to conclude there is a low potential for risk to site users from contamination and the Claremont Meadows site is considered suitable for the intended commercial / industrial land use.

## 12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The report has been prepared specifically for the client for the purposes of the commission, and no warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be amended in any way without prior approval by JBS&G, or reproduced other than in full including all attachments as originally provided to the client by JBS&G.

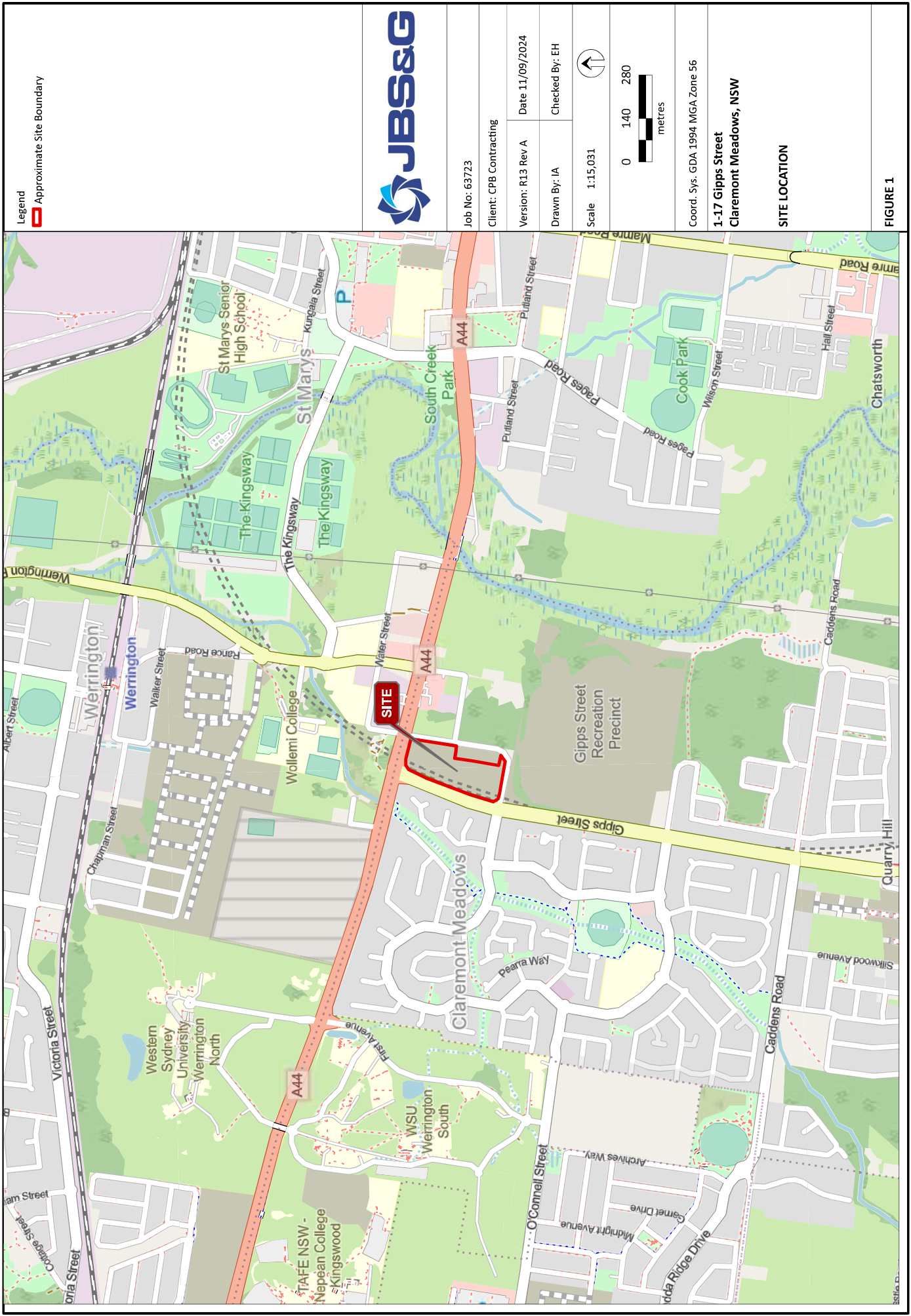
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements or agreed scope of work.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

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

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

## Figures



Legend  
Approximate Site Boundary



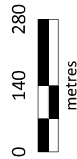
Job No: 63723

Client: CPB Contracting

Version: R13 Rev A      Date 11/09/2024

Drawn By: IA      Checked By: EH

Scale: 1:15,031



Coord. Sys: GDA 1994 MGA Zone 56

**1-17 Gipps Street  
Claremont Meadows, NSW**

**SITE LOCATION**

**FIGURE 1**



 Approximate Site Boundary











Legend

- Approximate Site Boundary
- Unexpected Finds
- Car Park CMSF
- North Area CMSF



Job No: 63723

Client: CPB Contracting

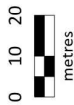
Version: R13 Rev A

Date 12/09/2024

Drawn By: IA

Checked By: EH

Scale 1:1,750



Coord. Sys. GDA 1994 MGA Zone 56

1-17 Gipps Street  
Claremont Meadows, NSW

LOCATION OF UNEXPECTED FINDS

FIGURE 4



## Appendix A    Site Survey