SYDNEY METRO - WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

Site Audit Report and Site Audit Statement – Claremont Meadows Service Facility

Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works

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Document approval

Rev	Date	Prepared by	Reviewed by	Approved by
1	20/12/24	Ramboll	Ramboll	Ramboll
2	3/4/25	Ramboll	Ramboll	[redacted]
Signature				

Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this plan is reviewed and approved. The Project SMWSA CPBG Director is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director and/or client before being distributed/implemented.

Revision Details

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1	Issued for information
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Prepared for

CPB Contractors Pty Ltd and Ghella Pty Ltd

Prepared by

Ramboll Australia Pty Ltd

Date

20 December 2024

Project Number

318001447-002

Audit Number

TO-095-A5

SITE AUDIT REPORT

CLAREMONT MEADOWS SERVICES FACILITY SBT WORKS, SYDNEY METRO WESTERN SYDNEY AIRPORT

RAMBOLL

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20 December 2024

CPB Contractors Pty Ltd and Ghella Pty Ltd
Attn.: [redacted]
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Dear [redacted],

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Audit No. TO-095-A5

SITE AUDIT REPORT - CLAREMONT MEADOWS SERVICES FACILITY SBT WORKS, SYDNEY METRO WESTERN SYDNEY AIRPORT

I have pleasure in submitting the Site Audit Report for the subject site. The Site Audit Statement, produced in accordance with the NSW *Contaminated Land Management Act 1997*, is included as Appendix B of the Site Audit Report. The Audit was commissioned by CPB Contractors Pty Ltd and Ghella Pty Ltd (CPBG) to assess the suitability of the site for its intended commercial/industrial land use (operation of a Sydney Metro services facility).

The Audit was initiated to comply with requirements of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces and is therefore a statutory audit.

Thank you for giving me the opportunity to conduct this Audit. Please call me on 9954 8100 if you have any questions.

Yours faithfully,
Ramboll Australia Pty Ltd

[redacted]

[redacted]
EPA Accredited Site Auditor 1505

cc: NSW EPA – Statement only
Penrith City Council

Ramboll Australia Pty Ltd.
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LIST OF ABBREVIATIONS

Measures

%	per cent
µg/L	Micrograms per Litre
ha	Hectare
km	Kilometres
L	Litre
m	Metre
m^2	Square Metre
m^3	Cubic Metre
mAHD	Metres Australian Height Datum
mbgl	Metres below ground level
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
mm	Millimetre
ppm	Parts Per Million
t	Tonne

General

ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
ADWG	Australian Drinking Water Guidelines
AEC	Areas of Environmental Concern
AF	Asbestos Fines
ALS	Australian Laboratory Services
AMP	Asbestos Management Plan
ANZG	Australian & New Zealand Guidelines
ASET	Australian Safer Environment and Technology Pty Ltd. (Laboratory)
ASS	Acid Sulfate Soil
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes & Naphthalene
CCME	Canadian Council of Ministers of the Environment
CEC	Cation Exchange Capacity
CLM Act	NSW Contaminated Land Management Act 1997
CMSF	Claremont Meadows Services Facility
COC	Chain of Custody
Council	Penrith City Council
CPBG	CPB Contractors Pty Ltd and Ghella Pty Ltd
CS	Characteristic Situation
CSM	Conceptual Site Model
CSSI	Critical State Significant Infrastructure
DA	Development Application
DGA	Data Gap Assessment
DGV	Default Guideline Value
Douglas	Douglas Partners Pty Ltd
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EES	Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW
EIL	Ecological Investigation Level
ENM	Excavated Natural Material
Envirolab	Envirolab Services Pty Ltd
EPA	Environment Protection Authority (NSW)
EPL	Environment Protection Licence
ESL	Ecological Screening Level
FA	Fibrous Asbestos
GME	Groundwater Monitoring Event
GSV	Gas Screening Value
GSW	General Solid Waste

HGG	Hazardous Ground Gas
HIL	Health Investigation Level
HSL	Health Screening Level
IAA	Interim Audit Advice
JBS&G	JBS&G Australia Pty Ltd
LCS	Laboratory Control Sample
LEP	Local Environment Plan
Metals	As: Arsenic, Cd: Cadmium, Cr: Chromium, Cu: Copper, Ni: Nickel, Pb: Lead, Zn: Zinc, Hg: Mercury
ML	Management Limits
MS	Matrix Spike
NAPL	Non-Aqueous Phase Liquids
NATA	National Association of Testing Authorities
NC	Not Calculated
ND	Not Detected
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NL	Non-Limiting
n	Number of Samples
OCPs	Organochlorine Pesticides
OPPs	Organophosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PFAS	Per- and Poly-Fluoroalkyl Substances
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
pH	A measure of acidity, hydrogen ion activity
PID	Photoionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
Ramboll	Ramboll Australia Pty Ltd – previously Ramboll Environ Australia Pty Ltd and ENVIRON Australia Pty Ltd
RAP	Remediation Action Plan
RL	Relative Level
RPD	Relative Percent Difference
RRE	Resource Recovery Exemption
RRO	Resource Recovery Order
SAQP	Sampling Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SBT	Station Boxes and Tunnelling
SEPP R&H	Resilience and Hazards State Environment Planning Policy (2021)
SMWSA	Sydney Metro - Western Sydney Airport
SPR	Source, Pathway and Receptor
SQG	Soil Quality Guidelines
SWL	Standing Water Level
TEQ	Toxic Equivalence Quotient
TfNSW	Transport for New South Wales
TRHs	Total Recoverable Hydrocarbons
TTMP	Tetra Tech Major Projects Pty Ltd
UF	Unexpected Find
USEPA	United States Environmental Protection Agency
VENM	Virgin Excavated Natural Material
VOCs	Volatile Organic Compounds
VR	Validation Report
WH&S	Workplace Health & Safety
-	On tables is "not calculated", "no criteria" or "not applicable"

1. INTRODUCTION

1.1. Audit Details

A site contamination audit has been conducted in relation to the Claremont Meadows Services Facility (CMSF), which forms part of the Sydney Metro – Western Sydney Airport (SMWSA) rail project. The site is located at Part 1-17 Gipps Street, Claremont Meadows NSW. The Audit boundary is defined by the red outline in **Attachment 1, Appendix A**.

The Audit was conducted to provide an independent review by an EPA Accredited Auditor of whether the land is suitable for any specified use or range of uses, i.e. a "Site Audit" as defined in Part 1 Clause 4 (1) (definition of a 'site audit' (b) (iii)) of the NSW *Contaminated Land Management Act 1997* (the CLM Act).

The Audit was initiated to comply with requirements of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces for construction of new stations, tunnels, bridges, viaducts, and rail and associated ancillary infrastructure along the SMWSA rail alignment from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. Condition E96 of the CSSI requires a site audit as follows:

> *"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."*

The Audit was initiated to comply with condition E96 of the CSSI approval and is therefore a statutory audit.

This site audit report (SAR) and accompanying site audit statement (SAS, provided in **Appendix B**) have been prepared to comply with this condition. Station Boxes and Tunnelling (SBT) Works have been completed, including preparation of the site for use as a services facility to support construction activities for the underground tunnel portions of the SMWSA and included a shaft, as well as temporary construction facilities, a water treatment plant and amenities. Evaluation of the CSSI conditions of consent is summarised in **Section 13.4**.

Details of the Audit are:

Requested by:	[redacted] on behalf of CPB Contractors Pty Limited and Ghella Pty Ltd (CPBG)
Request/Commencement Date:	9 May 2022
Auditor:	[redacted]
Accreditation No.:	1505
Audit No.:	TO-095-A5

1.2. Project Background

The SMWSA railway project includes the construction of new stations, a train stabling and maintenance facility, rail infrastructure facilities, tunnels, bridges, viaducts and associated ancillary infrastructure. Sydney Metro engaged the joint venture of CPBG for the design and construction of the SBT Works. A follow-on contractor has been engaged to complete rail infrastructure.

The CMSF site has been used by CPBG as a services facility to support construction activities for the underground tunnel portions of the SMWSA and included a shaft, as well as temporary construction facilities, a water treatment plant and amenities.

Prior to construction, the site had been subject to previous preliminary intrusive investigations of soil and groundwater which did not identify contamination above human health criteria for a commercial/industrial land use. Although previous investigations did not identify widespread or visible asbestos contamination, asbestos was detected through laboratory assessment as fibrous asbestos (FA) in two surface soil samples at concentrations below the adopted human health criteria.

A basic remediation action plan (RAP) was prepared outlining the requirements for waste management (handling and offsite disposal of excess soils), importation of material, the suitability assessment of any fill material which may remain (including potential asbestos impact) and any additional sampling requirements recommended to address data gaps. Preparation of the DSI and the RAP was required under a Deed (*Sydney Metro (2022) Sydney Metro - Western Sydney Airport, Station Boxes and Tunnelling Works Design and Construction*) between Transport for New South Wales (TfNSW) and CPBG.

Data gaps identified included potential risks associated with possible historic use of part of the site as a service station and potential migration of hazardous ground gas (HGG) from the offsite former Gipps Street Landfill (located south of the site). A data gap assessment (DGA) and hazardous ground gas risk assessment (HGGRA) were completed for the site. Findings did not identify any additional contamination requiring remediation, however, the HGGRA recommended additional monitoring of HGG be undertaken to assess for changes in the gas situation resulting from construction works.

Subsequently, four monthly gas monitoring events at the site were undertaken from June to September 2023. In addition, CPBG obtained two reports from Penrith City Council prepared by Douglas Partners Pty Ltd (Douglas) relating to HGG assessments at the neighbouring former Gipps Street Landfill. Based on the results of the monthly gas monitoring events and the data within the reports for the Gipps Street Landfill, the ongoing monthly gas monitoring recommended by the HGGRA was deemed no longer necessary.

1.3. Interim Audit Advice

The Auditor has previously undertaken independent reviews of a detailed site investigation (DSI), remediation action plan (RAP), data gap assessment (DGA) and hazardous ground gas risk assessment (HGGRA) and a letter documenting the rationale for cessation of HGG monitoring. The reviews were documented in interim audit advice (IAA) letters IAA1 (dated 19 August 2022), IAA8 (dated 28 September 2022), IAA15 (dated 17 April 2023) and IAA18 (dated 10 October 2023). IAAs have been prepared for other sites within the SMWSA alignment, hence IAA numbers are not sequential. Preparation of the IAAs was undertaken to satisfy a requirement of the Deed between TfNSW and CPBG. Relevant information from the IAAs has been included in this Site Audit Report (SAR). The IAAs are attached as **Appendix C** to this SAR.

1.4. Scope of the Audit

The scope of the Audit included:

- Review of the following reports:
  - 'Sydney Metro – Western Sydney Airport Technical Paper 8 Contamination', dated October 2020, M2A (*the Technical Paper*).
  - 'Ground Gas Monitoring and Assessment, Proposed Recreational Development, Gipps Street, Claremont Meadows, NSW', dated 25 March 2021, Douglas.
  - 'Claremont Meadows, Sampling Analysis Quality Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works', dated 30 March 2022, Tetra Tech Major Projects Pty Ltd (TTMP) (*the SAQP*).
  - 'Waste Classification and Onsite Re-Use Assessment of Stockpiled Soil Material – 1-17 Gipps Street, Claremont Meadows NSW', dated 13 April 2022, EDP Consultants Pty Ltd (EDP) (*the EDP WC*).

  - 'Sampling Analysis and Quality Plan Addendum – Claremont Meadows Services Facility, Sydney Metro Western Sydney Airport', dated 27 May 2022, Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES) (*the SAQP Addendum*).
  - 'Additional Ground Gas Investigation Works, Proposed Recreational Development, Gipps Street, Claremont Meadows', dated 8 July 2022, Douglas.
  - 'Detailed Site Investigation for Claremont Meadows Services Facility', dated 27 July 2022, EES (*the DSI*).
  - 'Remediation Action Plan, 1-17 Gipps Street, Claremont Meadows NSW', dated 26 September 2022, EES (*the RAP*).
  - 'Hydrogeological Report (Project-wide), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works', dated 23 February 2023, TTMP (*the Hydrogeological Report*).
  - 'Hazardous Ground Gas Risk Assessment - Claremont Meadows Services Facility', Version 1 dated 6 April 2023, EES (*the HGGRA*).
  - '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', dated 13 April 2023, EES (*the DGA*).
  - 'Factual Gas Monitoring Report No.1 (June 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', dated 16 June 2023, EES.
  - 'Factual Gas Monitoring Report No.2 (July 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', dated 14 July 2023, EES.
  - 'Factual Gas Monitoring Report No.3 (August 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', dated 10 August 2023, EES.
  - 'Factual Gas Monitoring Report No.4 (September 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', dated 14 September 2023, EES.
  - 'Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF) in Claremont Meadows, NSW', dated 25 September 2023, EES (*the Cessation Letter*).
  - 'Factual Gas Monitoring Report No.5 (October 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', dated 12 October 2023, EES (*the Oct HGG report*).
  - 'Validation Report, Claremont Meadows Service Facility', dated 21 November 2024, JBS&G Australia Pty Ltd (JBS&G) (*the VR*).

- Review of management plans prepared by CPBG for the SMWSA Rail Project, including:
  - 'Asbestos Management Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Work' Revision C, dated 22 February 2024 (and earlier version Revision A, dated 2 February 2022), CPBG (*the AMP*).
  - 'NSW (Off-Airport) Soil and Water Management Sub-Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works' (Revision 2), dated 15 August 2024 (and earlier version Revision A, 19 May 2022), CPBG (*the Sub-Plan*).
- Site visits by the Auditor on 11 October 2022 and 19 November 2024.
- Discussions with CPBG, and with TTMP, EES and JBS&G who undertook the investigations or validation.

Draft versions of the above reports were issued for audit review and review comments were issued by the Auditor (by email) which were incorporated into the final reports. The Technical Paper was prepared prior to the Auditor's engagement and was reviewed for factual content. The

Technical Paper is understood to be a supporting document to the Sydney Metro – Western Sydney Airport Environmental Impact Statement (EIS), which was not provided. The Technical Paper included a Preliminary Site Investigation (PSI) of the SMWSA footprint, and a detailed summary of the site history and existing data available when the EIS was prepared. The scope of works within the SAQP Addendum was provided to the Auditor following completion of the DSI and therefore was also only reviewed for factual aspects. No discussion was had with Douglas who undertook the investigations in the neighbouring Gipps Street Landfill.

TTMP, EES and JBS&G reported that previous investigations had been undertaken at the site including two contamination assessments undertaken by Cardno in 2021 and a factual contamination report prepared by a joint venture of Golder Associates Pty Ltd and Douglas Partners Pty Ltd (Golder-Douglas Partners) in 2021. Summaries of these reports were included in the various reports and the data was included as an appendix to the SAQP. The majority of the original reports were not provided for Auditor review, however, where provided, the reports were reviewed for factual information.

The Auditor has reviewed the key documents against the guidelines made or approved under Section 105 of the CLM Act and other relevant documents, including:

- National Health and Medical Research Council (NHMRC) (2008) *'Guidelines for Managing Risks in Recreational Water'*.
- NHMRC and Natural Resource Management Ministerial Council of Australia and New Zealand (2011) *'Australian Drinking Water Guidelines'* (ADWG).
- National Environment Protection Council (NEPC) *'National Environment Protection (Assessment of Site Contamination) Measure 1999'*, as Amended 2013 (NEPM).
- NSW EPA (2014) *'Waste Classification Guidelines, Part 1: Classifying waste'.*
- NSW EPA (2015) '*Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997'.*
- NSW EPA (2016) *'Environmental Guidelines: Solid Waste Landfills'*.
- NSW EPA (2017) *'Guidelines for the NSW Site Auditor Scheme (3rd Edition)'.*
- Australian and New Zealand Guidelines (ANZG) (2018) *'Guidelines for Fresh and Marine Water Quality'*.
- ANZECC & ARMCANZ (October 2000) *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 3, Primary Industries - Rationale and Background Information'*.
- Australia and New Zealand Heads of EPAs (HEPA 2020) *'PFAS National Environmental Management Plan, Version 2.0'* (NEMP).
- NSW EPA (2020a) *'Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'.*
- NSW EPA (2020b) *'Contaminated Land Guidelines, Assessment and management of hazardous ground gases'.*
- Chapter 4 Remediation of Land in the Resilience and Hazards State Environment Planning Policy (SEPP) (2021) (SEPP R&H, formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land'.*
- Western Australia Department of Health (WA DoH) (2021) *'Guidelines for the assessment, remediation and management of asbestos contaminated sites'.*
- NSW EPA (2022) *'Contaminated Land Guidelines, Sampling design part 1 – application' and 'Contaminated Land Guidelines, Sampling design part 2 – interpretation'.*

2. SITE DETAILS

2.1. Location

The site details are as follows:

Street address:	Part 1-17 Gipps Street, Claremont Meadows, NSW 2747
Identifier:	Part Lot 1601 Deposited Plan (DP) 1282557
Local Government:	Penrith City Council
Owner:	TfNSW
Site Area:	Approximately 4.0 hectares (ha)

The site locality is shown on **Attachment 2, Appendix A**. A survey plan of the site boundary, including geocentric datum for various points, was provided and has been included in the site audit statement (**Appendix B**).

The site boundaries are well defined by chain-wire fencing.

2.2. Zoning

The current zoning of the site is R3 (Medium Density Residential) over the majority of the site and E3 (Productivity Support) for land fronting The Great Western Highway under the Penrith Local Environmental Plan (LEP) 2010.

2.3. Adjacent Uses

The site is located within an area of mixed residential, open space and commercial land uses. The surrounding site use includes:

North: Great Western Highway (GWH) with a reserve, Claremont Creek and Wollemi College beyond. A timber yard and service station were located to the northeast of the site on the northern side of the GWH.

East: Vegetated land, Putland Street, service station and McDonalds beyond. A fenced compound was located directly adjacent to the eastern site boundary to the southeast of the site.

South: Gipps Street Recreational Precinct (former landfill).

West: Gipps Steet and residential properties beyond.

2.4. Site Condition – Before Construction

TTMP undertook a limited walkover inspection of the site in March 2022 for the SAQP prior to site establishment by CPBG and noted the following:

- A chain-link fence surrounded the site.
- The site appeared to be relatively level however had a slight slope down to the north.
- The majority of the site was characterised by tall, dense grass/weed cover (over 1 m in height), with a bare area in the central portion of the site. Soil in this area appeared to comprise sandy gravel fill including recycled brick, concrete, fibre cement and ceramic and vinyl tile. Two fragments of fibre cement sheet debris were collected and subsequently analysed for asbestos at TTMPs National Association of Testing Authorities accredited laboratory. Laboratory analysis indicated that no asbestos was identified in the fragments.
- One groundwater monitoring well and one soil vapour well were identified along the southern boundary of the site (SMWSA-BH-A365 and SMWSA-BH-A366, respectively). Two additional groundwater wells were identified in the north-western portion of the site (SMGW-BH-A109 and SMGW-BH-A304).

- A stockpile was observed along the western portion of the site. The stockpile was heavily overgrown and difficult to observe. The dimensions of the stockpile were estimated to be approximately 50 m long, 20 m wide, 3 m high.

Similar site conditions were reported by EES during a walkover inspection in April 2022. Additional features reported by EES included a gravel surfaced area and two stockpiles located on the site. These site features are shown in **Attachment 3, Appendix A**.

The following was noted by the Auditor during the site visit, shortly after CPBG established onsite, on 11 October 2022:

- Earthworks had commenced in the northern half of the site with stockpiles of soil visible. Piling works were underway for the shaft.
- Site sheds had been established and were raised above the ground surface. Imported aggregates were observed beneath the sheds and along vehicle access ways.
- Two stormwater detention basins were observed and lined with geofabric, one in the north-western corner of the site and the other located midway along the western site boundary.
- The stockpile documented by TTMP in the western portion of the site was no longer present.
- An area to the south of the sheds was fenced off and sign posted with asbestos signage.

2.5. Site Condition – After Preparatory Construction and Validation

JBS&G completed a site inspection on 19 November 2024 and reported in the VR that 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 asphalt car park and site sheds were 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 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 southeast of site was on concrete hardstand and the laydown area in the north of site appeared to be on imported gravel.
- A water treatment plant was located 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.
- 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.

Similar site conditions were observed by the Auditor during the inspection on 19 November 2024.

2.6. Proposed Development

The CMSF site has been developed/constructed by CPBG and used as a services facility to support construction activities for the underground tunnel portions of the SMWSA and included a shaft, as well as temporary construction facilities, a water treatment plant and amenities. It is understood that CPBG will hand over the site to another entity for the ongoing use of the site as a services facility to support construction activities for the underground tunnel portions of the SMWSA.

According to SMWSA rail project webpage, the site will not be publicly accessible and will provide fresh air ventilation for the tunnel section between Western Sydney International Airport to Bringelly, and emergency exits.

For the purposes of this audit, the 'commercial/industrial' land use scenario will be assumed.

3. SITE HISTORY

The Technical Paper included a review of the site history for the SMWSA alignment (including the site) based on available historical aerial images and review of NSW EPA records. The SAQP and DSI included a summary of the site history, which noted the following:

- The site was in private ownership from 1905 to 1974 when it was purchased by the Housing Commission of NSW. The land title was then transferred to The Land Commission of New South Wales. The site was purchased by Roads and Maritime Services (now TfNSW) in 2012.
- Four houses and associated outbuildings/sheds were previously located along the eastern boundary of the site between 1955 and the 1970s. The number of houses had been reduced to one by the 1980s and this house was removed in the 2000s. The site appears to have been used as a rural residential area over this period.
- A building with two access driveways connecting to the Great Western Highway was present at the northern end of the site in the 1970s and 1980s. Based on its configuration it was inferred as a potential service station site, however, it may have been used for other commercial or residential purposes.
- From 2012 the site was cleared, vacant land and remained in this configuration until approximately 2015.
- Construction areas including buildings/sheds, parking, laydown areas, sediment basins and stockpiles were present over the majority of the site from 2015 to 2017, and in the northern half of the site from 2015 to the 2020s. It has been assumed that the site was in use to support road construction projects based on ownership by Transport NSW and construction activities taking place along Gipps Street adjacent to the CMSF site.
- The Gipps Street Landfill is located to the south of the site. The landfill was developed circa 1956 and is now closed. Several service stations are present to the east of the site.
- A stockpile was observed along the western portion of the site prior to DSI sampling. The stockpile was heavily overgrown and difficult to inspect. The dimensions of the stockpile were estimated visually to be approximately 50 m long, 20 m wide, 3 m high. This stockpile was understood to be contaminated with asbestos and perfluoroalkyl and polyfluoroalkyl substances (PFAS). The stockpile was subsequently disposed offsite, and the footprint sampled during the DSI.

3.1. Auditor's Opinion

The site history provides an adequate indication of past activities. Previous site uses with the most significant potential to cause contamination include potential storage of fuels in USTs from potential service station use, uncontrolled filling of the site including filling of construction related sediment basins, former construction related activities including stockpiling of materials of unknown origin, demolition of former buildings and structures which contained hazardous building materials and migration of contamination from current/former offsite commercial/industrial land uses (including services stations and timber yard) and offsite landfill activities.

4. CONTAMINANTS OF CONCERN

The Technical Paper identified historical activities with the potential for contamination (referred to as Areas of Environmental Concern (AEC)). Three AECs were identified as follows:

- AEC5: An area where stockpiling of spoil from road construction and material laydown occurred along with potential for asbestos containing material (ACM) in soil.
- AEC6: Groundwater impacted by the off-site former Gipps Street Landfill and potentially up-gradient industrial sites.
- AEC7: Contamination and landfill (hazardous ground gases) from the offsite former Gipps Street Landfill.

The location of these AECs is shown in **Attachment 4, Appendix A**.

Additional sources/AEC for potential contamination were identified by TTMP in the DSI. The DSI provided a list of potential onsite and offsite contamination sources/activities and the potential associated contaminants of concern. These have been tabulated in **Table 4.1**.

Table 4.1: Contaminants of Concern

Activity	Potential Contaminants
Onsite soil and fill materials: Historic site uses indicates potential for application of pesticides and herbicides at the surface. Localised uncontrolled fill may have historically occurred. Includes AEC5.	Metals, total recoverable hydrocarbons (TRH), BTEX (benzene, toluene, ethylbenzene and total xylenes), polycyclic aromatic hydrocarbons (PAH), organophosphorus pesticides (OPP), organochlorine pesticides (OCPs) and asbestos
Onsite historic building footprints: Use of hazardous building materials and poor demolition practices	Metals, OCP, OPP and asbestos
Onsite potential former service station	Lead, TRH, BTEX and PAHs
Migration of contaminated groundwater beneath the site. Includes AEC6	Metals, TRH, BTEX, volatile organic compounds (VOCs), pH, nutrients and hazardous ground gases (HGG)
Onsite storage of waste materials including stockpiles	Metals, TRH, BTEX, PAHs, per- and poly-fluoroalkyl substances (PFAS) and asbestos
Offsite former Gipps Street Landfill (AEC7)	Metals, TRH, BTEX, Naphthalene and PFAS HGG
Offsite service stations	Lead, TRH, BTEX and Naphthalene

4.1. Auditor's Opinion

The Auditor considers that the analyte list used by EES adequately reflects the site history and condition. The Auditor notes that polychlorinated biphenyls (PCBs) are also a contaminant of concern associated with fill material and hazardous building materials. Although PCBs were not identified as a contaminant of concern, they were included in the analyte list during the DSI.

Although identified as a contaminant of concern for onsite storage of waste materials in stockpiles, there has been no assessment by the consultants for the presence of PFAS. In the Auditor's opinion there are no indications in the site history that they would be potential contaminants of concern.

5. STRATIGRAPHY AND HYDROGEOLOGY

5.1. Stratigraphy

TTMP and EES reviewed geological maps and reported that the site is underlain by Quaternary aged unconsolidated alluvial fine-grained sand, silt and clay underlain by the Triassic aged Bringelly Shale of the Wianamatta Group. Bringelly Shale is comprised of dark shale, rare coal, lithic sandstone, laminite and carbonaceous claystone.

EES undertook 31 test pits (TP1 to TP31) across the site as part of the DSI as shown in **Attachment 5, Appendix A**. The sub-surface profile of the site prior to CPBG establishment is summarised by the Auditor in **Table 5.1**.

Table 5.1: Stratigraphy

Depth (mbgl)	Subsurface Profile
0.0 – 2.4	Fill material generally comprising clay and clay topsoil was identified from the surface and extended generally to depths of between <0.5 mbgl and 1 mbgl. Deeper fill materials were identified at depths between 2.3 and 2.4 mbgl at TP04 and TP05 and appear to be located within backfilled former sediment basins. Gravelly fill materials (road base) were identified at the surface at six locations (TP01, TP06, TP08, TP09, TP12 and TP13) located in the north-eastern portion of the site. Anthropogenic inclusions were identified in fill materials at approximately 35% of sample locations scattered across the site and included plastic, tiles, asphalt, brick, concrete, geofabric, wire, rope and metal.
0.1 – 2.4 to termination depth of 4 mbgl.	Natural clay soils were identified beneath the fill at all locations and extended to the termination depth of the sample location. Sandstone bedrock was encountered at depths of 3.2 to 3.5 mbgl at TP01, TP02, TP05 and TP07 while shale bedrock was encountered at depths of 1 to 1.7 mbgl at TP08, TP21, TP23 and TP30.

mbgl – metres below ground level

TTMP reported that the Atlas of Australian Acid Sulfate Soil (ASS) compiled by CSIRO was reviewed during the SAQP to assess the probability of occurrence of ASS within the site. It was reported by TTMP that the ASS risk plan indicates that the site is located in an area with Extremely Low Probability of Occurrence of ASS.

Following CPBG establishment on site, minor cut/fill earthworks along with importation of materials were required to enable use as an intermediate facility for the SMWSA project. These works would have altered the site stratigraphy.

5.2. Hydrogeology

TTMP undertook a search for registered bores during the SAQP. Three bores were identified within a 250 m radius of the site. The bores were installed to 6 mbgl, registered for monitoring purposes and located approximately 100 m east of the site at an existing service station. The Auditor undertook a search in November 2024 and identified the same bores. The Auditor notes that standing water level (SWL) information was not available, and the records indicated a licence status of "Cancelled" for these bores.

EES anticipated groundwater flow to be toward South Creek, which is northeast from the site. Water-bearing units potentially comprise a shallow, unconfined system 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 mbgl. 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. EES also anticipated groundwater velocity to be very slow with low hydraulic conductivity, due to the low permeability and (primary) porosity of the site geology.

TTMP reported in the SAQP that three monitoring wells had been installed previously at the site and a groundwater elevation was recorded at approximately 25 mAHD. During the DSI, EES undertook groundwater measurements from two wells (SMGW-BH-A109S and SMGW-BH-A365) where groundwater was measured at 2.00 mbgl (SMGW-BH-A109S) and 3.14 mbgl (SMGW-BH-A365). EES reported that these measurements equated to a groundwater elevation of between 25.4 – 30.0 mAHD.

5.3. Auditor's Opinion

The Auditor considers that the stratigraphy and hydrogeology detailed by TTMP and EES adequately reflect the site conditions and are sufficient for the purpose of the audit. The heterogeneity and extent of fill material has the greatest potential to identify contamination at the site during works. The Auditor concludes that the shallow formation underlying the site is of low permeability and therefore the potential for significant groundwater contamination or migration of contamination is low.

6. EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL

The Auditor has assessed the overall quality of the data by review of the information presented in the referenced reports, supplemented by field observations. The data sources are summarised in **Table 6.1**.

Table 6.1: Summary of Investigations

Stage of Works	Field Data	Analytical Data
DSI (EES, 2022) *Fieldwork date: April to May 2022* **Attachments 5 and 6, Appendix A**	31 test pits (TP01-TP31) providing site coverage. Three boreholes (BH1235 – BH1237) targeting bedrock within the proposed tunnel shaft Eight test pits (TP201 to TP208) targeting the footprint of a former stockpile Six test pits (MP1 to MP6) targeting a small stockpile Installation of one new groundwater monitoring well (GW-1028) One groundwater monitoring event (GME) from two existing wells (SMGW-BH-A109S and SMGW-BH-A365) Hazardous ground gas (HGG) spot monitoring of one existing HGG monitoring well (SMGW-BHA366).	Soil: • 78 samples - Metals, TRH, BTEX and PAHs • 49 samples - OCPs, OPPs and PCBs • 60 samples - asbestos (presence/absence) • 8 samples - asbestos (% w/w) • 5 samples – pH, iron and cation exchange capacity (CEC) Stockpiled soil: • 22 samples - Metals, TRH, BTEX and PAHs • 8 samples - OCPs, OPPs and PCBs • 4 samples - PFAS • 25 samples - asbestos (presence/absence) Groundwater (two samples): Metals, TRH, BTEX, OCPs and OPPs
DGA (EES, 2022) *Fieldwork date: September 2022* **Attachment 7, Appendix A**	Six boreholes (BH1-BH6) targeting the potential former services station	Soil: • 16 samples - Metals, TRH, BTEX and PAHs • 4 samples - asbestos (presence/absence)
HGGRA (EES, 2023) *Fieldwork date: January to February 2023* **Attachment 8, Appendix A**	Four boreholes (GBH1-GBH4) targeted the southern site boundary and installation of four HGG monitoring wells. Continuous monitoring via installation of a GasfluX in one location (GBH1) between 16 January 2023 and 16 February 2023 (around 30 days of monitoring data). One GME from two existing wells (SMGW-BH-A109S and SMGW-BH-A365)	Groundwater (2 samples): dissolved hydrocarbon gases (methane, ethene, ethane, propene, propane, butene and butane)
Monthly HGG monitoring data summarised in Cessation Letter (EES, 2023) *Fieldwork date: June to September 2023*	HGG spot monitoring monthly events from the four HGGRA installed wells (GBH1-GBH4).	Gases by field monitor: methane, oxygen, carbon dioxide, carbon monoxide and hydrogen sulfide
Oct HGG (EES, 2023) *Fieldwork date: September 2023*	HGG spot monitoring October 2023 monthly event from the four HGGRA installed wells (GBH1-GBH4)	Gases by field monitor: methane, oxygen, carbon dioxide, carbon monoxide and hydrogen sulfide
VR (JBS&G, 2024)	Samples collected for waste classification of material for offsite disposal.	None

The Auditor's assessment of data quality follows in **Table 6.2** and **Table 6.3**.

Table 6.2: QA/QC – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Data Quality Objectives (DQO) EES did not specifically define DQOs in accordance with the seven-step process outlined in Schedule B2 of NEPM (2013). The following decisions were identified by JBS&G in the DQOs of the VR: • 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?	On the basis that EES clearly stated the project and investigation/report objectives and have designed effective sampling strategies to achieve them, overall the Auditor considers that the omission of specific DQOs does not affect the outcome of the audit.
Sampling pattern and locations *Soil:* Investigation locations were generally spaced to gain coverage of the majority of the site. Further samples targeted the area of the potential former services station and stockpiles. The various fill materials at the site were generally targeted for sampling, however, select natural samples were also sampled. *Groundwater:* One groundwater monitoring well was installed during the DSI towards the centre of the site. Wells installed during previous investigations were located in the north-western and southern portions of the site. *Ground gas:* gas monitoring wells were located in close proximity to the southern site boundary near the neighbouring former landfill.	In the Auditor's opinion, these investigation locations adequately target the main areas of concern.
Sampling density *Soil:* The sampling density of 35 locations over approximately 4.0 ha is below the minimum recommended (50 locations for a 4 ha site) by EPA (2022) *Contaminated Land Guidelines, Sampling design*. The coverage provides a 95% confidence of detecting a residual hot spot of approximately 33.4 m diameter. Samples analysed for asbestos were not collected according to the density outlined in NEPM (2013) (Schedule B1). *Groundwater*: One new groundwater well was installed at the site, with two existing wells sampled. *Ground gas:* A total of four wells were installed during the HGGRA towards the southern boundary. Spot monitoring was undertaken during the DSI at one existing well installed during previous assessments. The HGGRA included installation of a continuous monitor in one location (GBH1) between 16 January 2023 and 16 February 2023 (around 30 days of monitoring data). HGGRA installed wells were spot monitored once per month between June 2023 and October 2023.	The sampling density was adequate in the context of the site history, results and proposed site use as an intermediate services facility to support the SMWSA construction project.
Sample depths Soil samples were collected and analysed at pre-determined intervals within the soil profile (0.1, 0.5, 1.0 mbgl then one sample for each additional metre) or where changes in the soil profile were noted. The maximum depth of investigation was 4 mbgl and the maximum depth of sampling was 3.8 mbgl. Stockpile samples were collected approximately 0.3 m below the stockpile surface. Groundwater sample depths were not specified.	In the Auditor's opinion, this sampling strategy was appropriate and adequate to characterise the primary material types present on site.

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Well construction *Groundwater:* The new deep groundwater monitoring well was constructed of class 18 uPVC screen and casing to a depth of 21 mbgl with a long (6 m) screen due to the low permeability and porosity of the fine-grained sedimentary stratigraphy. The screen was 1 mm machine slotted with 2-3 mm graded sand used to create a filter to 0.5 m above the top of the screen section. Above the sand a 0.5 m bentonite clay plug was installed to prevent groundwater from overlying water bearing zones entering the screen along with top-down water ingress through the bore annulus. The bore annulus was then grouted to the surface and finished with a steel monument. This well was not sampled. Well construction details for wells installed during previous investigations and sampled by EES were not provided and therefore it is unknown if the SWL intersects the screen interval. *Ground gas*: The HGGRA included installation of four soil gas boreholes (GBH1 to GBH4) to maximum depths of approximately 4.15 mbgl constructed using 50 mm uPVC screen and casing with a screen length of 2 m. The screen was slotted with 1 mm wide slits to allow ground gas to enter the bore with 2 mm graded sand used to create a filter to 0.5 m above the top of the screen section. Above the sand a bentonite plug of approximately 1.3 m thickness was installed to mitigate potential cross contamination and/or ambient effects from the surface. The bore annulus was then concreted to the surface and finished with a high-visibility steel monument with a stick-up height of approximately 1 m. Well construction details of the existing well screened during the DSI were not provided.	In the Auditor's opinion, the well construction was generally acceptable. The deep well construction is not ideal for the assessment of contamination from near surface sources, however this was not the purpose of the well.
Sample collection method *Soil*: Samples collected from test pits were by hand using a fresh pair of nitrile gloves, either directly from the excavation or from the excavated soil. Samples collected from boreholes were collected from drill cuttings. 50 g and 500 mL samples were collected for laboratory analysis for asbestos or asbestos fines/fibrous asbestos (AF/FA). Eleven 10 L samples were collected from select DSI locations for field screening for ACM >7 mm, however, due to the clay nature of the samples could not be subject to 7 mm sieve in the field and therefore were visually assessed. *Groundwater*: Wells were developed with a bailer and samples were collected by dedicated sample tubing and Waterra foot-valves. *Ground gas:* Samples were not collected for laboratory analysis, however, EES utilised a calibrated LFG instrument (GFM436 or GA5000) to collect gas flow and component concentration readings at each well location during monitoring events. No leak testing was undertaken as the measurement procedure requires pumping of gas directly into the instrument when taking measurements from the wells. A calibrated Ambisense GasFlux continuous monitoring system was used to record gas flow and component concentration readings in one well every hour for a 30 day period.	Sample collection from drill cuttings or excavated spoil is not ideal as it can result in loss of volatiles and sample cross contamination. Given the key contaminant at the site was asbestos, this deficiency is not considered to be of great significance. Overall, in consideration of the contamination encountered, the sample collection method was found to be acceptable.
Decontamination procedures *Soil:* New gloves were reportedly used for each new sample. Decontamination of borehole drilling equipment or excavator bucket between locations was not explicitly reported. *Groundwater*: Dedicated sampling equipment was used for each well. New gloves were reportedly used for each new sample. *Ground gas*: Decontamination is not relevant to field measurement and continuous monitoring of LFG.	Acceptable

Sampling and Analysis Plan and Sampling Methodology	Auditor's Opinion
Sample handling and containers Soil and groundwater samples were placed into prepared and preserved sampling containers provided by the laboratory and chilled during storage and subsequent transport to the laboratories. Samples for asbestos analysis were placed in plastic zip-lock bags. EES did not report whether groundwater samples to be analysed for heavy metals were filtered in the field or at the laboratory.	Acceptable
Chain of Custody (COC) Completed COC forms were provided in the report.	Acceptable
Detailed description of field screening protocols *Soil:* Field screening for volatiles was undertaken using a PID. Soil sub-samples were placed in ziplock plastic bags and the headspace measured for VOCs after allowing time for equilibration. *Groundwater:* Field parameters were measured during well sampling and development. *Ground gas:* A GFM436 or GA5000 portable landfill gas analyser were used for the collection of gas readings. The GFM436 and GA5000 was used to assess concentrations of methane, oxygen, carbon dioxide, hydrogen sulfide and carbon monoxide and measure flow rates. The analyser was connected to gas taps fitted to 50 mm wells.	Acceptable
Calibration of field equipment The reports indicated that calibration had been undertaken prior to use. Calibration certificates from the equipment supplier were provided for the PID, water quality meter, LFG analyser and continuous monitor.	Acceptable
Sampling logs Soil logs were provided within the report, indicating sample depth, PID readings and lithology. With the exception of anthropogenic inclusions, the logs reported no indications of contamination were found. Groundwater field sampling records were provided, indicating SWL, field parameters, methodology and observations. Ground gas field monitoring sheets were provided in the monthly monitoring reports only, however, summary records were provided in tables presented in the appendices of the HGGRA and Cessation Letter reports.	Acceptable

Table 6.3: QA/QC – Field and Laboratory Quality Assurance and Quality Control

Field and Laboratory QA/QC	Auditor's Opinion
Field quality control samples Field quality control samples included trip blanks, trip spikes, field intra-laboratory and inter-laboratory duplicates. Wash blanks were not considered to be required by EES as there were only a small number of samples which were collected using dedicated sampling equipment.	The absence of wash blank samples for drilling equipment is considered acceptable given the lack of contaminant detections made.
Field quality control results The results of field quality control samples were generally within appropriate limits with some minor exceptions, mostly elevated relative percent difference calculations (RPDs) associated with variations in the sample matrix and/or concentrations close to the PQL.	Overall, in the context of the dataset reported, the elevated RPD results are not considered significant and the field quality control results are acceptable.
NATA registered laboratory and NATA endorsed methods Laboratories used included: ALS, Envirolab, Sydney Analytical Laboratories (SAL) and ASET.	Acceptable

Field and Laboratory QA/QC	Auditor's Opinion
Analytical methods Analytical methods were included in the laboratory test certificates. The laboratories provided brief method summaries of in-house NATA accredited methods used based on USEPA and/or APHA methods (excluding asbestos) for extraction and analysis in accordance with the NEPM (2013). Asbestos identification was conducted by polarised light microscopy with dispersion staining by method AS4964-2004 *Method for the Qualitative Identification of Asbestos Bulk Samples*. The NEPM (2013) methodology of assessing a 500 ml sample to achieve a lower detection limit is not NATA accredited.	The analytical methods are considered acceptable for the purposes of the site audit, noting that AS4964-2004 is currently the only available method in Australia for analysing asbestos.
Holding times Review of the COCs and laboratory certificates indicate that the holding times had been met. EES also reported that holding times were met.	Acceptable
Practical Quantitation Limits (PQLs) *Soil:* PQLs (except asbestos) were less than the threshold criteria for the contaminants of concern. *Asbestos:* The NATA approved limit of detection for asbestos in soil was 0.01% w/w, although NEPM (2013) analysis were reported to 0.001% w/w for AF/FA. *Ground gas:* PQLs were less than the threshold criteria.	The soil and groundwater PQLs were acceptable and detection levels for the landfill gas analyser were appropriate for the purpose of the LFG assessment. *Asbestos:* In the absence of any other validated analytical method, the detection limit for asbestos is considered acceptable.
Laboratory quality control samples Laboratory quality control samples including laboratory control samples, matrix spikes, surrogate spikes, blanks and duplicates were undertaken by the laboratory.	Acceptable
Laboratory quality control results The results of laboratory quality control samples were generally within appropriate limits with some minor exceptions.	In the context of the datasets reported, the minor exceptions are not considered significant and the laboratory quality control results are acceptable.
Data Quality Indicators (DQI) and Data Evaluation (completeness, comparability, representativeness, precision, accuracy) Predetermined data quality indicators (DQIs) were set for laboratory analysis including blanks, replicates, duplicates, laboratory control samples, matrix spikes and surrogate spikes. These were discussed with regard to the five category areas by EES during the DSI and DGA.	An assessment of the data quality with respect to the five category areas has been undertaken by the Auditor and is summarised in **Section 6.1** below.

6.1. Auditor's Opinion

In considering the data as a whole, the Auditor concludes that:

- While data is likely to be representative of the overall conditions, sampling and analysis for ACM was not undertaken in accordance with the densities specified in current guidelines (NEPM 2013) and results may not be representative of fill conditions.
- The data is considered to be adequately complete.
- There is a high degree of confidence that data is comparable for each sampling and analytical event.
- The primary laboratory provided sufficient information to conclude that data is of sufficient precision.
- There is a high degree of confidence that the data is accurate.

7. ENVIRONMENTAL QUALITY CRITERIA

The Auditor has assessed the results against Tier 1 criteria from NEPM (2013). Other guidance has been adopted where NEPM (2013) is not applicable, or criteria are not provided. Based on the proposed use of the site (**Section 2.5**), the human health and ecological criteria for 'commercial/industrial' land use exposure scenario were adopted.

7.1. Soil Assessment Criteria

7.1.1. Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) Health Investigation Levels (HILs) for 'Commercial/Industrial' (HIL D) land use.
- NEPM (2013) Health Screening Levels (HSLs) for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a clay soil type. Depth to source adopted was <1 m as an initial screen.
- NEPM (2013) Management Limits (MLs) for petroleum hydrocarbons for 'Commercial/Industrial' land use and assuming fine soil texture.
- NEPM (2013) HSLs for Asbestos Contamination in Soil for 'Commercial/Industrial' (HSL D) land use and the presence/absence of asbestos.
- HEPA (2020) NEMP perfluorooctanesulfonic acid (PFOS)/perfluorohexane sulfonate (PFHxS) and perfluorooctanoic acid (PFOA) soil criteria developed for 'Commercial/Industrial' land use. These criteria assume 80% background exposure, i.e. 20% of the tolerable daily intake recommended by Food Standards Australia New Zealand (2017). The PFOS/PFHxS criteria is compared to the sum of the PFOS and PFHxS concentrations.

7.1.2. Ecological Assessment Criteria

The Auditor has adopted ecological soil assessment criteria from the following sources:

- NEPM (2013) Ecological Screening Levels (ESLs) for 'Commercial/Industrial' land use, assuming fine soil.
- NEPM (2013) Ecological Investigation Levels (EILs) for 'Commercial/Industrial' land use. Site-specific EILs were derived using the Interactive (Excel) Calculation Spreadsheet provided in the ASC NEPM Toolbox assuming the contamination is "aged", no lead background concentrations, high traffic volume, 10% clay content and using site-specific pH and cation exchange capacity (CEC) values. The pH and CEC values adopted for the upper soil layers were an average obtained during sampling for the DSI which included a pH of 5.56 and CEC of 12.88 $_c$molc/kg.
- Canadian Council of Ministers of the Environment (CCME) (2010) *Canadian soil quality guidelines: carcinogenic and other polycyclic aromatic hydrocarbons (PAHs)* soil quality guideline (SQG) for benzo(a)pyrene for 'Commercial/Industrial' land use. The SQG has been adopted in place of the NEPM (2013) ESL as it is based on a larger and more up-to-date toxicity database than the low reliability NEPM (2013) ESL.
- HEPA (2020) PFOS/PFHxS and PFOA '*interim soil ecological indirect exposure*' criteria developed for all land uses.

7.1.3. Soil Aesthetic Considerations

The Auditor has considered the need for soil remediation based on 'aesthetic' contamination as outlined in *Section 3.6 Aesthetic Considerations* of NEPM (2013) Schedule B1, which acknowledges that there are no chemical-specific numerical aesthetic guidelines. Instead, site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

7.1.4. Imported Fill

Imported fill has been assessed in relation to attributes expected of virgin excavated natural material (VENM). The NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* defines VENM as "*…natural material (such as clay, gravel, sand, soil or rock fines):*

- *'that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities*
- *'that does not contain sulfidic ores or soils, or any other waste, and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice in the NSW Government Gazette."*

On this basis, the Auditor considers that for soil to be classified as VENM, the following criteria generally apply:

- Organic compounds (including petroleum hydrocarbons, PAHs, OCPs, PCBs and phenols) should be less than the PQLs.
- Inorganic compounds should be consistent with background concentrations.
- The material should not contain or comprise actual or potential acid sulfate soil.

Imported material, such as excavated natural material (ENM) or aggregates, was assessed against the requirements of the applicable resource recovery order (RRO) and resource recovery exemption (RRE) issued by the EPA under clause 93 of the *Protection of the Environment Operations (Waste) Regulation 2014*.

7.2. Groundwater Assessment Criteria

7.2.1. Human Health Assessment Criteria

The Auditor has adopted human health assessment criteria from the following sources:

- NEPM (2013) HSLs for 'Commercial/Industrial' (HSL D) land use. The HSLs assumed a clay soil type and a depth to groundwater of 2 to <4 m.
- NHMRC (2011) *National Water Quality Management Strategy, Australian Drinking-Water Guidelines* (ADWG), Version 3.8 Updated September 2022 for potable use or where HSLs are not applicable. The ADWG are also appropriate for assessing risks from groundwater to human health at the site due to the potential for direct contact.
- NHMRC (2008) *Guidelines for Managing Risks in Recreational Water* (GMRRW). The GMRRW indicates that a qualitative assessment of recreational use can be undertaken using 10 times the concentrations of chemicals stipulated in the ADWG. This is based on an assumed contribution for swimming equivalent to 10% of drinking water consumption. This adjustment only accounts for a reduced intake of groundwater, and therefore can only be applied to criteria derived based on health considerations and cannot be applied to criteria derived for aesthetic reasons (e.g. copper). The adjustment should also not be applied to volatile compounds (e.g. benzene) where inhalation is the primary pathway of concern. Where a 'health-based' and an 'aesthetic-based' criteria is provided, the 'health-based' criteria was adopted.
- WHO (2017) Guidelines for Drinking-water Quality, Fourth Edition, incorporating the 1st addendum.
- WHO (2008) *Petroleum Products in Drinking-water. Background document of WHO Guidelines for Drinking-water Quality* (adopted in absence of health-based criteria in WHO (2017) because the taste and odour of petroleum products will in most cases be detectable at concentrations below those of health concern).

7.2.2. Ecological Assessment Criteria

The Auditor has adopted ecological groundwater assessment criteria from the following sources:

- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia (www.waterquality.gov.au/anz-guidelines). Criteria for freshwater and 95% level of protection were adopted. Where the chemical is considered to bioaccumulate, the 99% level of protection was adopted.

7.3. Hazardous Ground Gas

Sub-surface gas concentrations were compared to the following threshold levels, as presented within NSW EPA (2016) *'Environmental Guidelines: Solid Waste Landfills'.* The threshold for further investigation and corrective action are detection of methane concentrations above 1% (v/v) (10,000 ppm) and carbon dioxide at concentration of 1.5% (v/v) (15,000 ppm) above established natural background levels. Natural background levels of methane were considered to be nil.

The Auditor also considered the Lower and Upper Explosive Limits (LEL and UEL) of methane of 5% (v/v) (50,000 ppm) and 15% (v/v) (150,000 ppm) respectively.

7.3.1. Level 2 Risk Analysis

The Auditor has further assessed the hazardous ground gas data provided by the consultant with reference to the NSW EPA (2020) *Assessment and Management of Hazardous Ground Gases*.

An assessment of sub-surface gas has been undertaken based on the method proposed by Wilson and Card (1999). The Wilson and Card method uses a characteristic situation (CS) for a site defined by both gas concentrations (methane and carbon dioxide) and volumetric borehole flow rates measured in the gas monitoring boreholes on the site. The Gas Screening Value (GSV) represents gas flow through the surface of the site as follows:

- GSV = maximum borehole flow rate (L/hr) × maximum gas concentration (% v/v)

In accordance with NSW EPA (2020b), a Characteristic Situation based on the GSV is used to determine further risk assessment and remedial actions, including:

- Where the CS is 1, no further action is required
- Where the CS is 2 or 3, gas protection measures are required. Appropriate gas protection measures for the site should be selected as outlined in Section 5 of the NSW EPA (2020b) guidelines
- Where the CS is 4, gas protection measures are required, and the need for a Level 3 risk assessment should be considered where necessary
- Where the CS is 5 or 6, gas protection measures are required, and a Level 3 risk assessment should be carried out to assess the maximal risk, inform the design of gas protection measures and determine the residual risk following implementation of those measures.

This is summarised in **Table 7.1** extracted from NSW EPA (2020b).

Table 7.1: Characteristic Situation based on the GSV

	GSV threshold (L/hr)	CS	Risk classification	Additional factors	Typical sources
	<0.07	1	Very low risk	Typically, methane <1% v/v and/or carbon dioxide <5% v/v; otherwise consider increase to CS 2	Natural soils with low organic content Typical fill
	<0.7	2	Low risk	Borehole flow rate not to exceed 70 L/hr; otherwise consider increase to CS 3	Natural soils with high organic content Recent deep fill
	<3.5	3	Moderate risk		Old inert waste landfill Flooded mine workings
	<15	4	Moderate to high risk	Consider need for Level 3 risk assessment	Mine workings susceptible to flooding Closed putrescible waste landfill
	<70	5	High risk	Level 3 risk assessment required	Shallow, unflooded abandoned mine workings
	>70	6	Very high risk		Recently used putrescible waste landfill

1. Site characterisation should be based on monitoring of gas concentrations and borehole flow rates for the minimum periods defined in Section 3.4.
2. The CSM must identify the source of gas and its generation potential.
3. Soil gas investigations should be conducted in accordance with the guidance provided in Section 3.4.
4. Where there is no detectable flow, the lower measurement limit of the instrument should be used.
5. To determine a GSV of <0.07, instruments capable of accurately measuring concentration to 0.5% v/v and flow to 0.1 L/hr are recommended.

7.4. Auditor's Opinion

The environmental quality criteria referenced by the Auditor are consistent with those adopted by EES and JBS&G.

8. EVALUATION OF SOIL RESULTS

As noted in **Section 1.4**, TTMP reported that previous investigations had been undertaken at the site including two contamination assessments undertaken by Cardno in 2021 and a factual contamination report prepared by a Golder-Douglas Partners joint venture in 2021. The reports were not provided for Auditor review, however, summaries were included in the SAQP by TTMP, and the data was tabulated and included as an appendix to the SAQP and are discussed in **Section 8.1**. The soil results obtained by EES during the DSI and DGA have been summarised/discussed in **Section 8.2**.

8.1. Previous Investigations

The scope of work completed in the previous investigations was summarised by TTMP as outlined in **Figure 8.1** below. The sample locations are shown in **Attachment 6, Appendix A**.

Figure 8.1: Summary of the Scope of Work for Previous Investigations (Source: the SAQP)

Report	Key Findings
Factual Contamination Report (Golder & Douglas Partners, Feb 2021)	• Two boreholes were drilled (SMGW-BH-A109 and SMGW-BH-A110) and sampled. BH-A109 is located at the shaft, and BH-A110 in the south western corner of the site.
Contamination Assessment Report (Cardno, May 2021)	• One borehole (SMGW-BH-A304) and one test pit (SMGW-TP-A303) was drilled/excavated and sampled on site. BH-A304 is located south of the shaft, and TP-A303 within the shaft.
Contamination Assessment Report – Phase D/E (Cardno, Nov 2021)	• Borehole SMGW-BH-A365 and SMGW-BH-A366 were drilled and sampled. BH-A365 was converted into a groundwater monitoring well, and BH-A366 was developed into a gas monitoring well. Groundwater and landfill gas monitoring data was not included in the report.

Soil sampling was mainly limited to the collection of samples in fill and natural materials less than 3 mbgl. Deeper soil and rock samples of natural materials were collected at BH-A304 to a depth of up to 19 m. Fill and natural soil samples were analysed for a range of potential contaminants including:

- Fill samples – metals, TRH, BTEX, OCPs (11 samples), PAHs and PFAS (10 samples), PCBs (six samples), phenols (four samples) and asbestos (presence/absence) (seven samples).
- Natural samples – metals (13 samples), TRH (14 samples), PFAS and BTEX (12 samples), PAHs (11 samples), OCPs (7 samples), phenols and PCBs (1 sample), and asbestos (presence/absence) (2 samples).

A tabulated summary of these results was provided by TTMP in the SAQP and included the number of detections and maximum concentrations.

TTMP noted that fill materials were observed in all investigation locations and the depth of fill ranged between 0.2 m in the northwest and 1 m in the southwest. Fill was largely described as silty sand, clayey sand or gravelly clay and pale brown to dark brown in colour. No visual/olfactory signs of contamination, such as soil staining and hydrocarbon odours, were reported.

In reviewing the analytical results tabulated by TTMP, the Auditor notes the following:

- Reported concentrations of analytes (potential contaminants) in both the fill and natural materials were below the adopted commercial/industrial human health guidelines.
- Traces of ethyl-xylene and xylene compounds were reported in the natural sample from BH-A304 at 12 mbgl. TTMP considered that further investigation is required to establish whether

there is a potential source of hydrocarbon contamination on the site or the results represent a false positives.

- Trace concentrations of PFAS were reported in both fill and natural soils. Maximum concentrations of PFOS (0.0009 mg/kg) and PFOA (0.0003 mg/kg) were below the adopted human health and ecological criteria.
- TTMP did not identify any ecological exceedances as the data review did not appear to consider ecological receptors. The Auditor notes that a TRH >C_{10}-C_{16} concentration of 230 mg/kg from natural soil sample BH-A366_1.5 was marginally above the ESL adopted (170 mg/kg) for commercial/industrial land uses by the Auditor. TTMP reported that visual and/or olfactory signs of hydrocarbon contamination were not reported in the previous investigations, however, considered that further investigation was required to establish whether there is a potential source of hydrocarbon contamination on the site, or the results from previous investigations are from false positives. Remaining results were below the ecological criteria adopted by the Auditor.

8.2. DSI and DGA Results

EES undertook a total of 54 boreholes and test pits during the DSI and DGA as described in **Table 6.1** (shown on **Attachment 5 and 7, Appendix A**). The following subsections provide a summary of the field and analytical results obtained by EES during the DSI and DGA.

8.2.1. Field Results

As noted in **Table 5.1**, anthropogenic inclusions were identified in fill materials at approximately 35% of sample locations scattered across the site including fragments of plastic, tiles, asphalt, brick, concrete, geofabric, wire, rope and metal. Evidence of gross contamination (including potential ACM or staining was not observed at the site surface or during the intrusive soil assessments by EES, however EES noted that the vegetation ground cover may have reduced the ability to identify potential asbestos/ACM. No evidence of potential sources of contamination such as areas of fuel/chemical storage were observed.

Field screening of soil samples was completed using a PID to detect VOCs during the DSI and DGA. EES reported that PID readings were generally low with results ranging from 0 to 1.2 ppm.

8.2.2. Analytical Results

Soil samples were analysed for the contaminants of concern and the results have been assessed against the environmental quality criteria outlined in **Section 7**. The Auditor has summarised the fill and natural soil analytical results in **Table 8.1**.

Table 8.1: Evaluation of Soil Analytical Results – Summary Table

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
ACM >7 mm (10 L samples)	11	0	Not Detected	0 above HSL D 0.05%	-
AF/FA (500 mL samples)	8	3	0.0004%	0 above HSL 0.001%	-
Asbestos in soil	72	3	<0.1g/kg	0 above 0.1 g/kg	-
Asbestos trace analysis	72	0	Not Detected	-	-
Benzene	116	0	<PQL	0 above HSL D 0-1 m, clay 4 mg/kg	0 above ESL (commercial/industrial) (fine) 95 mg/kg
Toluene	116	0	<PQL	0 above HSL D 0-1 m, clay NL	0 above ESL (commercial/industrial) (fine) 135 mg/kg

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
Ethylbenzene	116	0	<PQL	0 above HSL D 0-1 m, clay NL	0 above ESL (commercial/industrial) (fine) 185 mg/kg
Total Xylenes	116	0	<PQL	0 above HSL D 0-1 m, clay NL	0 above ESL (commercial/industrial) (fine) 95 mg/kg
F1 (TRH C_6–C_{10} minus BTEX)	116	0	<PQL	0 above HSL D 0-1 m, clay 310 mg/kg	0 above ESL (commercial/industrial) 215 mg/kg
F2 (TRH >C_{10}–C_{16} minus naphthalene)	116	0	<PQL	0 above HSL D 0-1 m, clay NL	-
TRH C_6–C_{10}	116	0	<PQL	0 above ML (commercial/industrial) 800 mg/kg	-
TRH >C_{10}–C_{16}	116	0	<PQL	0 above ML (commercial/industrial) 1000 mg/kg	0 above ESL (commercial/industrial) 170 mg/kg
TRH >C_{16}-C_{34}	116	5	390	0 above ML (commercial/industrial) 5000 mg/kg	0 above ESL (commercial/industrial) 2500 mg/kg
TRH >C_{34}-C_{40}	116	5	670	0 above ML (commercial/industrial) 10,000 mg/kg	0 above ESL (commercial/industrial) 6600 mg/kg
Naphthalene	116	0	<PQL	0 above HSL D 0-1 m, clay NL	0 above EIL (commercial/industrial) 370 mg/kg
Benzo(a)pyrene	116	0	<PQL	-	0 above CCME SQG (commercial/industrial) 72 mg/kg
Benzo(a)pyrene TEQ	116	0	<PQL	0 above HIL D 40 mg/kg	-
Total PAHs	116	1	0.7	0 above HIL D 4000 mg/kg	-
Arsenic	116	96	26	0 above HIL D 3000 mg/kg	0 above EIL (commercial/industrial) of 160 mg/kg
Cadmium	116	4	2	0 above HIL D 900 mg/kg	-
Chromium	116	115	101	0 above HIL D 3600 mg/kg	0 above site-specific EIL 680 mg/kg
Copper	116	115	178	0 above HIL D 240,000 mg/kg	0 above site-specific EIL 230 mg/kg
Lead	116	110	76	0 above HIL D 1500 mg/kg	0 above generic ACL (commercial/industrial) 1800 mg/kg
Mercury	116	0	<PQL	0 above HIL D 730 mg/kg	-
Nickel	116	92	92	0 above HIL D 6000 mg/kg	0 above site-specific EIL 340 mg/kg
Zinc	116	103	130	0 above HIL D 400,000 mg/kg	0 above site-specific EIL 560 mg/kg
PCB	57	0	<PQL	0 above HIL D 7 mg/kg	-
OCP	57	0	<PQL	0 above HIL D	0 above EIL
OPP	57	0	<PQL	0 above HIL D	-

Analyte	n	Detections	Maximum (mg/kg)	n > Human Health Screening Criteria	n > Terrestrial Ecological Screening Criteria
PFOA	4	1	0.0372	0 above NEMP HIL D 50 mg/kg	0 above NEMP direct exposure 10 mg/kg
Sum of PFOS and PFHxS	4	4	**0.0154**	0 above NEMP HIL D 20 mg/kg	0 above NEMP direct exposure 1 mg/kg, **1 above NEMP indirect exposure 0.01 mg/kg**

n number of samples
- No criteria available/used
NL Non-limiting
<PQL Less than the practical quantitation limit

In reviewing the analytical results, the Auditor notes the following:

- Asbestos was not observed during soil sampling however was detected through laboratory assessment as FA in fill soils in three surface samples (BH6_0.2, TP15_0.05 and TP207_0.05) at concentrations below the adopted HSL. The detection at TP207 was located within the footprint of the former stockpile noted in the SAQP to be located along the western portion of the site. This detection is likely a result of the stockpile not being fully removed rather than insitu site fill material.
- Concentrations of PFAS in the samples analysed from the former stockpile footprint were generally low or below the PQL, however, a sum of PFOS and PFHxS concentration was marginally above the adopted ecological indirect exposure criteria for all land uses in one sample (TP207_0.05). This detection is likely a result of the stockpile not being fully removed rather than leaching from the former stockpile to insitu site fill material.
- Remaining results were below the adopted human health and ecological criteria.

8.3. Auditor's Opinion

In the Auditor's opinion, the soil analytical results are consistent with the site history and field observations. The results indicate surficial asbestos impacts at concentrations below the human health criteria at three locations. The asbestos impact at BH6 and a portion of the impact in the vicinity of TP15 was removed from site (**Section 11.3.1**). Asbestos impacts identified at TP207 and the remaining area in the vicinity of TP15 were not disturbed during development works. The areas were covered in geofabric, fenced off from the rest of the site, signposted and managed through an asbestos management plan (AMP) prepared by CPBG (**Section 13.9**).

There is a low potential to encounter fill materials containing asbestos during construction. It is understood that any unexpected finds of asbestos encountered during development works were to be managed through the unexpected finds protocol within the RAP.

9. EVALUATION OF GROUND GAS RESULTS

As outlined in **Table 6.1**, EES initially undertook HGG screening of one existing borehole (SMGW-BHA366) during the DSI. The concentrations of methane measured during the HGG screening were reported below the minimum detection limit of the handheld gas analyser (0.1% v/v), while the flow rate was also below the minimum resolution of 0.1 L/hr. Carbon dioxide was reported at 18% v/v, which is above the NSW EPA (2016) threshold value of 1.5% v/v above background values (there is currently no background for the site). EES noted that the sampling conditions for the HGG screening were not considered to represent a 'worst-case' scenario.

EES recommended that an assessment of HGG is undertaken in accordance with NSW EPA (2020b) and as a result undertook the HGGRA. The HGGRA included installation of four soil gas boreholes (GBH1 to GBH4) to maximum depths of approximately 4.15 mbgl along the southern boundary of the site, closest to the offsite former Gipps Street Landfill (**Attachment 8, Appendix A**). HGG monitoring was undertaken in one location (GBH1) using a Ambisense GasFlux continuous monitoring system which recorded concentrations of gases (methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulfide), barometric pressure and borehole flow at approximately 1-hour intervals for a total duration of 30 days (16 January 2023 to 16 February 2023). A summary of the Ambisense results is provided in Figure 5.1 of IAA15 in **Appendix C**. EES noted that from approximately 1:13 am 18 January 2023 to approximately 12:15 am 20 January 2023 no readings were collected by the unit due to a technical issue (server issue), however EES noted that there was no impact on the subsequent data collected and no calibration was required. Graphic representation of the dataset across the monitoring period is included as Attachment 4 of IAA15 in **Appendix C**. In addition, two existing groundwater wells (SM-WSA-BH-A365 and GW-1028) were sampled for dissolved gases C_1–C_4 (methane, ethene, ethane, propene, propane, butene, butane). The results were less than the laboratory detection limit.

Key findings reported in the HGGRA, are as follows:

- Barometric pressure conditions during the monitoring period included continuous decreases in atmospheric pressure across a three-hour period, including one instance of a 'worst-case' scenario on 2 February 2023. EES believed that the data obtained was representative of both normal climactic conditions and indicative of 'worst-case' conditions.
- Results from the Ambisense GasFlux unit at GBH1 indicated that low concentrations of methane were present with a peak concentration of 0.06% v/v and carbon dioxide was present with peak readings of 20.9% v/v.
- Based on the results, methane is at very low concentrations under all conditions recorded. Ground gas risk at the site is driven by concentrations of carbon dioxide within the subsurface. There appears to be a correlation between carbon dioxide concentrations and barometric pressure readings. Decreases in atmospheric pressure result in an increase in carbon dioxide concentrations.
- EES calculated gas screening values (GSV) in accordance with the methodology outlined in NSW EPA (2020b) for the results obtained at GBH1 utilising the peak flow, methane, and carbon dioxide concentrations from the Ambisense GasFlux data and determined a site wide characteristic situation (CS). A maximum GSV of 0.073 L/hr was calculated using the maximum peak flow of 0.35 L/hr and the maximum carbon dioxide concentration reported. This correlates with a CS value of 2 and a 'low' risk rating.

Based on the results of the hazardous ground gas assessment, EES concluded in the HGGRA 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.

In view of the results and conclusion of the HGGRA and the understanding of potential for changes in response to sustained dewatering, EES recommended that regular HGG monitoring be undertaken at the four gas bores (GBH1 to GBH4).

Subsequently, monthly HGG spot monitoring was completed by ESS commencing in June 2023, and with the last round completed in October 2023. At each monitoring event, sub-surface gas monitoring was conducted at the four gas bores (GBH1 to GBH4) using a calibrated GA5000 landfill gas analyser. The results of these spot monitoring events were reported in separate letters with the June to September 2023 events consolidated in the Cessation Letter. Results were similar and consistent with the findings of the HGGRA.

EES were provided with two reports prepared by Douglas for Penrith City Council in relation to the former Gipps Street Landfill site. The Cessation Letter included a review of these Douglas reports, including the current and historical ground gas data (Douglas and EES) from on-site and off-site locations to evaluate prevailing ground gas conditions, include GSV and CS in accordance with NSW EPA (2020b).

Based on the Douglas reports, EES reported that the northern extent of the former landfill is approximately 70 m south of the site, the waste mass is up to 14 m thick and the landfill does not appear to have been lined, with the waste deposited into residual soil comprising clay, sandy clay and clayey sand. The landfill does include a cap that is between 0.5 m and 3.4 m thick. A leachate trench was installed around 2007 between the former landfill and the site that extends along the northern, eastern and southern extent of the landfill. The leachate trench is keyed into underlying bedrock and is expected to be at least 14-15 m deep. There are three landfill gas bores along the northern boundary of the former landfill: GAS 5 and GAS 6 located outside the footprint of the former landfill and BH103 located within the footprint of the former landfill (**Attachment 11, Appendix A**).

The Cessation Letter included a consolidated data set review from six locations (GAS 5, GAS 6 and GBH1 to GBH4) obtained from Douglas and EES spanning from 30 March 2017 to 6 September 2023. This data was considered by EES to be representative of ground gas conditions to the north of the former landfill. Review of the data indicates that the methane and carbon dioxide concentrations were fairly consistent over time and between wells, with some minor variability. Methane concentrations appeared relatively low while carbon dioxide concentrations were elevated in the monitored boundary wells (and were typically greater than carbon dioxide concentrations found in BH103 located within the landfill).

The maximum (peak) methane concentration across the data set was 2.8% v/v (at GAS 6 on 18 June 2020) while the maximum flow (initial) was 9.7 L/h (at GAS 6 on 3 June 2020) indicating a methane GSV of 0.3 and CS 2 ('low risk'). Generally, the recorded methane GSVs for each location were very low (0.000 to 0.03) and CS 1 (indicative of a 'very low risk'). The maximum (peak) carbon dioxide concentration across the data set was 29.5% v/v (at GBH1 on 8 June 2023) while the maximum flow is 9.7 L/h (at GAS 6 on 3 June 2020), with a maximum carbon dioxide GSV of 0.4 and CS 2 (indicative of 'low risk').

EES noted that the Douglas reports hypothesised that elevated carbon dioxide outside the landfill is naturally occurring and/or due to background conditions. The carbon dioxide concentrations at location GAS 6 (outside the landfill footprint) are relatively higher than the concentrations at location BH103. Based on these results, EES reported that this supports the Douglas hypothesis that carbon dioxide concentrations are naturally occurring.

Based on the findings of the Cessation Letter, the following conclusions were drawn by EES:

- "*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.*

In view of the results of this landfill gas assessment completed herein, it is considered that ongoing monitoring of ground gas conditions is not appropriate at this stage."

9.1. Auditor's Opinion

Overall, in the Auditors opinion, the HGG dataset for the site and the former Gipps Street Landfill reviewed in the Cessation Letter, is adequate to assess potential migration of HGG from the offsite former Gipps Street Landfill to the site. The results identified a risk classification based on the GSV as very low to low risk from ground gas (based on current conditions). Carbon dioxide concentrations are considered to be attributable to natural sources and based on the results migration of HGG from the offsite former Gipps Street Landfill to the site does not appear to be impacting the site.

10. EVALUATION OF GROUNDWATER RESULTS

As noted in **Section 1.4**, TTMP reported that previous investigations had been undertaken at the site including two contamination assessments undertaken by Cardno in 2021 and a factual contamination report prepared by a Golder-Douglas Partners joint venture in 2021. The reports were not provided for Auditor review, however, summaries were included in the SAQP and the data was tabulated and included as an appendix and is discussed in **Section 10.1**. The groundwater results obtained by EES during the DSI is discussed in **Section 10.2**. Well locations are shown on **Attachment 6, Appendix A**.

10.1. Previous Investigations

TTMP reported that groundwater monitoring was completed from three wells; SMGW-BH-A304, SMGW-BH-A109 and SMGW-BH-A109S.

Laboratory analysis of groundwater samples was limited to analysis for metals and inorganics in SMGW-BH-A109 and SMGW-BH-A109S. Laboratory analysis of the sample from SMGWBH-A304 included organic contaminants in addition to metals and inorganics.

In reviewing the analytical results tabulated by TTMP, the Auditor notes the following:

- Elevated concentrations of heavy metals and ammonia were detected above the adopted freshwater ecological criteria.
- Concentrations of TRH, BTEX and PAHs were not detected above the laboratory PQL.
- Trace concentrations of PFOS and OCPs (DDD) were detected in the groundwater sample from SMGW-BH-A304.

10.2. DSI Groundwater Results

EES undertook groundwater sampling from two existing monitoring wells, SMGW-BH-A109S and SMGW-BH-A365, as part of the DSI between April and May 2022 as described in **Table 6.1**. The following sub-sections provide a summary of the field and analytical results obtained by EES during the DSI.

10.2.1. Field Results

EES reported that groundwater levels ranged between approximately 2.00 and 3.14 mbgl and reported the water level range between approximately 25.39 mAHD (SMGW-BH-A109S) and 29.96 mAHD (SMGW-BH-A365).

Groundwater field parameters were recorded as follows:

- Dissolved oxygen (DO): 0.37 mg/L and 4.81 mg/L;
- Electrical conductivity (EC): 946 µS/cm and 31,471 µS/cm;
- pH: 6.18 pH units and 6.36 pH units;
- Redox potential (eH): -40 and 156; and
- Temperature: 18.1°C and 19.7°C.

No odours and/or Non-Aqueous Phase Liquids (NAPL) were reported in the DSI.

10.2.2. Analytical Results

Groundwater was sampled and analysed for a variety of contaminants. The Auditor has assessed the results against the environmental quality criteria outlined in **Section 7**. Groundwater sampling locations are shown as **Attachment 6 and 9, Appendix A**.

In assessing the analytical results, the Auditor makes the following observations:

- Concentrations of BTEX, TRH, OCPs and OPPs were not detected above the laboratory PQL.

- Concentrations of metals were generally low or below the laboratory PQL, however, elevated concentrations of zinc were identified in both samples above the ANZG (2018) criteria adopted for ecological receptors.
- Concentrations of nutrients (ammonia as N) were below the criteria in both samples of groundwater. The shallow bore (SMGW-BH-A109A) also reported detections of nitrate and ortho-phosphate which were below the PQL in the deep bore (SMGW-BH-A365).

EES reported that groundwater samples from the two bores reported two broad chemistries likely reflecting the shallow (alluvial) groundwater system and the deeper bedrock system. These systems were dominated by the same cations and anions (Na+ and Cl-) but an order of magnitude difference in concentrations. The sub-dominant cations and anions in each system were different with the shallow system (bore SMGW-BH-A109S) having greater proportions of Ca^{2+} and HCO^{3-} while the deeper (bore SMGW-BH-A365) had greater Mg^{2+} and SO_4^{2-}. This is potentially a reflection of the deeper groundwater system being comprised of connate water while the shallow is precipitation dominated.

10.3. Auditor's Opinion

In the Auditor's opinion, the groundwater monitoring undertaken was adequate to assess potential site sourced impact and migration of contamination from the former Gipps Street Landfill. Results did not indicate impact from landfill leachate with potential indicators of leachate impact (e.g., ammonia, nitrate and potassium) generally at anticipated background concentrations. Elevated concentrations of metals (zinc) were identified, however, these are typical of shale bedrock aquifers and are unlikely to be a result of onsite/offsite contamination sources.

11. EVALUATION OF SOIL MANAGEMENT AND VALIDATION

The following subsections provide a discussion of the CSM and RAP, and development works undertaken including unexpected finds (UFs), waste disposal and importation of materials.

11.1. Conceptual Site Model

A conceptual site model (CSM) is a representation of the source, pathway and receptor linkages at a site. EES developed a CSM and used it iteratively throughout the site assessment to inform decisions around investigation and management requirements. The CSM was initially developed following the preliminary investigations and has been updated as new information became available. The intrusive investigations did not identify an immediate requirement to undertake site remediation works. However, data gaps were identified (potential former service station and HGG) and potential existed for unexpected finds (UFs) during development/construction works. Therefore, a RAP was prepared to document the additional investigation requirements, an unexpected finds protocol and processes for material handling (i.e. waste disposal, importation of material and validation of retained fill material) to ensure that the site is suitable for the intended use as a construction site. Investigation of the data gaps were addressed during the HGGRA and DGA (results included in **Section 8 and 9**), which also did not identify a requirement for remediation.

The density of sampling for the assessment of asbestos in previous investigations was low and therefore the Auditor considered there to be potential to encounter fill materials containing asbestos and other UFs during construction. The Auditor has developed the below brief CSM for the site following the investigations undertaken, including:

- *Source:* Fill/soil potentially impacted with asbestos or the potential for other unexpected contamination.
- *Pathway:* Direct contact, ingestion or inhalation of asbestos contaminated soil/fibres.
- *Receptors:* On site workers during development, excavation or future maintenance works
- *Risk posed:* Negligible as concentrations were less than corresponding health-based investigation levels for commercial/industrial land uses.

11.2. Review of RAP

To satisfy the requirements of the Deed and as per the recommendations in the DSI, EES prepared the RAP to outline the requirements for additional investigations to address data gaps, an unexpected finds protocol and processes for material handling during preparatory construction works. The Auditor's review of the RAP is documented in IAA8 (**Appendix C**).

Potential remediation options were presented and evaluated for project suitability. The RAP noted that site impacts identified to date are related to the presence of asbestos/ACM in fill/soils. Two preferred remedial options were selected: treatment via 'emu-picking' for visible asbestos and reuse of material under a barrier (e.g. road seal); and excavation of contaminated material with offsite disposal to landfill. Whilst contamination had not been identified, the RAP identified the relevant options for contamination most likely to be identified on site.

The Auditor concluded in IAA8 that "*The remediation approach recommended in the RAP is considered adequate to manage contamination that is likely to be identified and the process for material handling (i.e. waste disposal, importation of material and validation of retained fill material) is appropriately documented. Should contamination be identified, the RAP, if adequately implemented, should ensure the site is suitable for the proposed construction activities, however, successful validation will be required to confirm this.*".

11.3. Development Works Undertaken

The VR documents that development and construction activities at the site included the following:

- Installation of fencing, environmental mitigation including erosion and sediment controls
- Clearing of vegetation
- Local area works including adjustments to access roads, 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 concrete bunds
- Installation of piling pads, footings and foundations
- Bored piling works for services shaft
- Services facility shaft excavation
- Construction of the cast-in-situ shaft
- Operation of water treatment plant and discharge of water.

The following subsections outline the management of localised areas of asbestos impact, waste disposal and importation of materials during development/construction works.

11.3.1. Localised Areas of Asbestos Impact

The VR documented that two areas of asbestos impact (termed 'unexpected finds' or 'UFs' in the VR) were identified during development/earthworks which required management to address workplace health and safety (WH&S). JBS&G reported in the VR that an Asbestos Removal Control Plan (ACRP) was prepared by the engaged licenced asbestos removal contractor (Mann Group). A summary of the areas of asbestos impact, including the remediation and validation undertaken, has been summarised by the Auditor in **Table 11.1** below. The approximate location of the areas of asbestos impact are illustrated in **Attachment 10, Appendix A**.

Table 11.1: Summary of Areas of Asbestos Impact

Area	Management and Validation Activities
North Area: identification of asbestos contamination on the ground surface in the northern portion of site during the earthworks (BH6). The asbestos impacts were reported to be non-friable (bonded) ACM fragments.	• Visual assessment of the area by Mann Group to define the extent of impact. • Asbestos impacted soils removed by Mann Group. Materials were directly loaded for offsite disposal. Air monitoring for removal works was undertaken by Airsafe and reported concentrations less than the reporting limit. • A clearance inspection was undertaken by Airsafe on 20 September 2022. The clearance inspection included a visual inspection of the area with no asbestos observed on the surface.
Car Park Area: an area in the vicinity of TP15 (AF/FA < HSL detected during DSI) in the central eastern portion of site for construction of a car park	• Visual assessment of the area prior to excavation and removal of required extent of asbestos impacted soils to allow construction of carpark by Mann Group. Materials were directly loaded for offsite disposal. Air monitoring for removal works was undertaken by Airsafe and reported concentrations less than the reporting limit. • A clearance inspection was undertaken by Airsafe on 7 November 2022. The clearance inspection included a visual inspection of the area with no asbestos observed on the surface and collection of four soil samples from the excavation. Laboratory analysis of the four samples did not detect asbestos.

Based on the above, the localised areas of asbestos impact were considered by JBS&G to have been appropriately managed in accordance with the requirements of the RAP. It is noted that the area of asbestos impact identified in TP207 and the portion of TP15 outside of the constructed car park remain on the site and will be managed by the AMP.

11.3.2. Material Disposed Off-Site

Waste materials generated on-site were sampled and classified in accordance with the EPA (2014) *Waste Classification Guidelines*. Sampling from stockpiles of excavated soils and in-situ material was undertaken to characterise and classify the waste materials prior to off-site disposal. 47,809 tonnes (t) of waste material was documented in the VR by JBS&G as being disposed off-site including the following waste types:

- General Solid Waste (non-putrescible) (GSW)
- GSW - Special waste (Asbestos)
- Excavated Natural Material (ENM)
- Virgin Excavated Natural Material (VENM)

Waste materials were disposed from the site between September 2022 and October 2024. JBS&G included supporting documentation in the VR from the contractors including waste disposal dockets and waste tracking documentation.

The Auditor has reviewed the documentation provided and is of the opinion that the supplied documentation is consistent with the works described. Further assessment of the waste classifications and disposal quantities is provided in **Section 14.6**.

11.3.3. Imported Material

The VR documents that approximately 11,947 t of materials were imported to the site as part of the site preparation operations. A summary of these imported materials including relevant classification/characterisation documents from the suppliers and importation dockets were appended to the VR.

JBS&G reported that the materials imported to the site were managed by CPBG through a SMWSA project specific 'Material Reuse and Importation Procedure'. This procedure was appended to the VR and JBS&G noted that although the importation requirements detailed in the RAP were not strictly followed, the implemented procedure was considered appropriate for determining the suitability of the materials imported to the site. JBS&G noted that management of material importation as per the CPBG procedure included:

- Confirmation the material was sourced from a quarry with an environmental protection licence (EPL), classified as either VENM or ENM, or supplied in accordance with a NSW EPA RRO/RRE
- Review of supplier documentation by the CPBG Environmental Coordinator (EC)
- EC to assess the material during import (through visual inspection and/or sampling and analysis)
- CPBG to 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.

Based on the information presented in the VR, it is understood that CPBG generally implemented the procedure and reported no issues were identified. It was further understood that there were no materials rejected based on the import assessment process.

Based on the information presented in the VR, the Auditor has summarised the materials imported to the site in **Table 11.2**.

Table 11.2: Imported Material

Source Site	Volume Imported (t)	Material Type	Site Use	Summary of Supporting Documentation	Auditor Comments
Elford Group Badgerys Creek, 320 Badgerys Creek Road, Badgerys Creek NSW	5,065	Sandstone (VENM)	Crane pad and haul road	The VR documents that the Elfords sandstone is sourced from multiple tunnelling projects/ development sites and then temporarily stored at their facility in Badgerys Creek. The VR noted that material was sourced from WestConnex Stage 3B M4 M5 Rozelle and a certificate provided in Appendix L of the VR documented that the waste was Rozelle Interchange Tunnel Spoil as defined in Section 1 of the *Rozelle Interchange tunnel spoil order 2019*. 'Waste Analysis and Classification Report' prepared by ADE Consulting Group (ADE) (26 April 2022) presented results of 12 samples over three stockpiles (approximately 112 to 150 m^3 per stockpile) from the Rozelle Tunnel Site C. ADE described the sampled materials as natural silty sand. Samples were analysed for a range of potential contaminants including metals, TRH, BTEX, PAHs, PCBs, OCP, OPP, phenols and ASS indicators. Concentrations of organic analytes were below the PQLs, metals concentrations were low, and presence of ASS was not detected. ADE concluded that the sampled material was compliant with the *Rozelle Interchange tunnel spoil order 2019*.	Material import register documents indicate that the material was imported to the site between 16 August and 8 September 2022. The Auditor considers that the imported product has been produced under an applicable RRO/RRE and is not VENM. Sampling in accordance with the RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.
ATL Badgerys Creek, Southern tunnel Spoil generated from Airport Business Park to Aerotropolis	57	Shale (VENM)	Temporary XP Ramps	Documentation classifying the material was not provided. The CPBG Material Importation checklist was included in Appendix L of the VR. The checklist notes that the material was imported as VENM sourced from the SMWSA tunnel alignment between Airport business park and Aerotropolis.	Material import register documents indicate that the material was imported to the site on 17 April 2024. Supporting documentation classifying the material was not provided and sampling in accordance with the RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.
SBT Orchard Hills	2,721	Tunnel spoil	Cross passage tunnels	Documentation classifying the material under an applicable RRO/RRE was not provided. The CPBG Material Importation checklist was included in Appendix L of the VR. The checklist notes that the material was imported as VENM sourced from the	Material import register documents indicate that the material was imported to the site between April and July 2024. The Auditor considers that the imported product has been produced under an applicable RRO/RRE.

Source Site	Volume Imported (t)	Material Type	Site Use	Summary of Supporting Documentation	Auditor Comments
				SMWSA tunnel alignment between St Marys Station and Orchard Hills Station under The Sydney Metro Western Sydney Airport tunnelling material order 2023.	Sampling in accordance with the RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.
ECORR, Eco Resource Recovery, 155 Newton Rd, Wetherill Park	1,571	Recovered Aggregate (DGB20)	Site establishment	Documentation classifying the material under an applicable RRO/RRE was not provided. Recovered aggregate test documentation from the supplier was included in Appendix L of the VR. This included laboratory certificates for analysis of metals, asbestos and foreign materials performed on four samples in July and August 2022. Asbestos was not detected and remaining results met the *Recovered Aggregate Order 2014*.	Material import register documents indicate that the material was imported to the site in August 2022 and therefore test documentation from the supplier covers the period of import. Sampling in accordance with the RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.
	290	Recycled Roadbase (40DGS)	Site establishment	Documentation classifying the material under an applicable RRO/RRE was not provided.	Material import register documents indicate that the material was imported to the site in October 2024. Although supporting documentation was not provided, the Auditor notes that the source company recycles construction waste to create engineered construction materials and operates under an EPL (No. 10699). On this basis, the Auditor considers that the imported product is likely to be produced under an applicable RRO/RRE. Sampling in accordance with the RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.
Boral Recycling Windemere Rd, Wetherill Park	2,243	Recovered Aggregate (DGB20)	Office pad	Documentation classifying the material under an applicable RRO/RRE was not provided. Recovered aggregate test documentation from the supplier was included in Appendix L of the VR. This included laboratory certificates for analysis of metals and foreign materials performed on one sample in April, May and June 2022. Foreign materials were not detected and remaining results met the RRO.	Material import register documents indicate that the material was imported to the site in July, August and September 2022. The company operates under an EPL (No. 11815) and scheduled activities under the EPL include resource recovery. On this basis, the Auditor considers that the imported product is likely to be produced under an applicable RRO/RRE. Sampling in accordance with the

Source Site	Volume Imported (t)	Material Type	Site Use	Summary of Supporting Documentation	Auditor Comments
					RAP was not undertaken, however, based on the information provided by CPBG including visual observations and the conclusions made by JBS&G, the Auditor is of the opinion that these materials are suitable for use on the site from a contamination perspective.

Based on the information presented in the VR, JBS&G made the following conclusions on imported materials "*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.*".

11.4. Auditor's Opinion

In the Auditor's opinion, the localised areas of asbestos impact were adequately managed/remediated via offsite disposal. Validation was undertaken in general accordance with the RAP and was adequate to demonstrate successful removal. Two areas of asbestos impacted fill remain at the site (a portion of TP15 and TP207), however, the concentrations reported are below the human health criteria. Due to the site being a workplace (services facility) under the *Workplace Health and Safety Act 2011* (WH&S Act), the AMP is to be implemented where asbestos is present or deemed likely to be present.

Material disposal and importation during the course of development works was generally undertaken in accordance with the relevant guidelines and regulations. Imported materials were not assessed in accordance with the RAP, however, these materials are considered acceptable for use on the site from a contamination perspective based on the supporting documentation provided by the suppliers and observations made by CPBG.

Due to the discrete nature of asbestos contamination, there is a low potential for asbestos to remain onsite, however, if present, concentrations are expected to pose a low risk to human receptors and can be managed by the AMP. The Auditor also notes that Conditions E98 and E99 of the development consent require the preparation and implementation of an Unexpected Contaminated Land and Asbestos Finds Procedure prior to and during construction. This will mitigate the potential risk associated with unexpected contamination during future construction works on the site.

12. CONTAMINATION MIGRATION POTENTIAL AND ASSESSMENT OF RISK

12.1. Auditor's Opinion

Asbestos encountered within fill material during development works was excavated and disposed offsite from two areas (BH6 and a portion of TP15). Asbestos impacted fill material remains in two areas (a portion of TP15 and TP207) at concentrations below the human health criteria. The areas are fenced with appropriate signage and covered with geofabric and are to be managed under the AMP. Disturbance of these areas is unlikely to result in off-site migration, however has the potential to pose a WH&S risk during future bulk earthworks and therefore should be undertaken in accordance with the AMP (or any subsequent revisions).

Chemical contamination was not identified in soil and groundwater, therefore, there is no potential for migration of chemical contamination from the site or vertically to groundwater. The results also indicate that contaminant concentrations do not pose a risk to site users or the environment under the proposed/ongoing land use scenario.

There is potential for asbestos to remain in areas where site fill materials were re-used or were not disturbed. Any future unexpected finds should be managed in accordance with the Unexpected Contaminated Land and Asbestos Finds Procedure required under Conditions E98 and E99 of the development consent.

There is a potential risk of contamination from materials imported to the site during ongoing use as an intermediate facility. The suitability of any materials imported during future development or construction works should be verified in accordance with relevant guidelines, regulations, and the intended land use exposure scenario.

Beneficial re-use of groundwater is not proposed at the site, therefore, the risks to human health are low (i.e. no direct contact with seepage and no groundwater abstraction). Any future use of groundwater would require appropriate groundwater assessment and regulatory approvals from the NSW Office of Water.

13. COMPLIANCE WITH REGULATORY GUIDELINES AND DIRECTIONS

13.1. General

The Auditor has used guidelines currently made and approved by the EPA under section 105 of the CLM Act.

The reporting was generally conducted in accordance NSW EPA (2020) *Contaminated Land Guidelines, Consultants Reporting on Contaminated Land*.

13.2. Resilience and Hazards State Environment Planning Policy (SEPP) (2021)

The investigation was generally conducted in accordance with Chapter 4 Remediation of Land in the Resilience and Hazards State Environment Planning Policy (SEPP) (2021) (SEPP R&H, formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land'*. Documents that may be required by SEPP R&H and the status of these are summarised in **Table 13.1**.

Table 13.1: Reports Anticipated by SEPP R&H

Item	Auditor's Opinion
Preliminary Site Investigation	Addressed by the Technical Paper, SAQP and DSI which identified past or present potentially contaminating activities and provided a preliminary assessment of the extent and nature of site contamination and included a detailed appraisal of the site history.
Detailed Site Investigation	Addressed by the DSI, DGA and HGGRA reports. These were undertaken to define the nature, extent and degree of contamination; assess the potential risk posed by contaminants to human health and the environment by considering the likelihood of exposure to contaminants of concern and the potential effect of such exposure; and obtain sufficient information for the development of a remediation plan (if necessary).
Remediation Action Plan	Addressed by the RAP
Validation Report	Addressed by the VR
Environmental Management Plan	Not required

13.3. Notification

The asbestos removal contractor notified SafeWork NSW of the proposed asbestos removal works and the notification was appended to the VR.

13.4. Development Approvals

A CSSI approval 10051 was issued on 23 July 2021 by the Minister for Planning and Public Spaces for construction of new stations, tunnels, bridges, viaducts, and rail and associated ancillary infrastructure along the SMWSA rail alignment from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. Condition E96 of the CSSI requires a site audit as follows:

> *"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."*

This SAR and accompanying SAS were prepared to comply with this condition.

13.5. Duty to Report

Consideration has been given to the requirements of the EPA (2015) *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*. Based on the findings presented in this SAR, the Auditor considers that the site is not required to be notified under the Duty to Report requirements.

13.6. Waste Management

In accordance with Section 4.3.7 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition),* the Auditor has checked the following aspects relating to waste disposal.

13.6.1. Waste Classification

Waste classification letters have been prepared by various consultants which were either provided separately or were appended to the VR. It was reported that wastes were classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*. The adopted waste classification strategy included sampling from stockpiles of excavated soils and in-situ material.

The following waste classification letter reports have been reviewed by the Auditor:

- EDP WC. Pre-existing soil stockpile (1,100 m^3) from unknown source. The stockpile was classified as GSW – Special waste (asbestos).
- 'Waste Classification of Material at the Claremont Meadows Services Facility – 1-17 Gipps St, Claremont Meadows NSW 2747', 9 September 2022, EES. Soil stockpile (30 m^3) sourced during excavation of UFs in north area. The stockpile was classified as GSW – Special waste (asbestos).
- 'Waste Classification of Material (TP15) at the Claremont Meadows Services Facility – 1-17 Gipps St, Claremont Meadows NSW 2747', 11 October 2022, EES. Soil stockpile (58 m^3) sourced during excavation in the vicinity of TP15 for car park works. The stockpile was classified as GSW – Special waste (asbestos).
- 'Materials Analysis & Classification Report, Putland Street and Gipps Street Claremont Meadows, 2747', 9 September 2022, ADE Consulting Group Pty Ltd (ADE). Soil stockpile (1000 m^3) sourced from multiple excavation works within fill material (0-0.5 mbgl) from various areas of the site. Material classified in 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.
- 'Excavated Natural Material Assessment 23122, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works Claremont Station', 21 August 2023, NEO Consulting Pty Ltd (NEO). Soil stockpile (1790 m^3) sourced from sandstone crane pad and the piling spoil made up of shale. Classified as ENM.
- 'Waste Classification Report, P23122- Sydney Metro West, Gipps Street Claremont, Meadows NSW 2747', 24 July 2024, NEO. Soil stockpile (1000 m^3) sourced from the excavation of cross passages. The stockpile was classified as GSW.

13.6.2. Waste Volumes, Disposal Receipts and Disposal Facilities

Waste disposal dockets were included in the VR for the period of April 2022 to June 2023. The VR also included a waste tracking register prepared by CPBG. The Auditor reviewed a selection of the documents including the EPLs of the waste disposal facilities to confirm compliance.

Table 13.2 summarises the waste disposal information for soil material disposed offsite to several waste management facilities that are licensed to receive the specified waste under their EPLs. A total of 47,809 tonnes of soil wastes were removed and disposed offsite.

Table 13.2: Summary of Waste Disposal

Waste Classification	Tonnage (t)	Disposal Facility	EPL No.
GSW – Special waste (asbestos)	304	Bingo Eastern Creek Recycling Ecology Park, 1 Kangaroo Avenue, Eastern Creek, NSW	13426
GSW	2,371	Brandown Waste and Recycling Pty Ltd, 37 Lee Holmes Drive St Marys	5857
VENM	24,797	Nepean Business Park, Old Castlereagh Road, Penrith 2759	Not applicable
	175	AWJ Kemps Creek, 657-769 Mamre Road, Kemps Creek	Not applicable
	6,925	PCC Sport Centre, 31 Gipps St Recreational Precinct	Not applicable
	3,513	SBT Works FS01, 560 Badgerys Creek Road, Badgerys Creek	Not applicable
ENM	1,644	Great River development located at 14-98 Old Castlereagh Road, Penrith	Not applicable
	1,023	AWJ Kemps Creek, 657-769 Mamre Road, Kemps Creek	Not applicable
	7,057	SBT Works FS01, 560 Badgerys Creek Road, Badgerys Creek	Not applicable

The Auditor noted that the 5,408 tonnes of material disposed to Nepean Business Park was documented as GSW on dockets and in the CPBG export register. JBS&G documented in the VR that this material was VENM. It was also documented in the VR that the Nepean Business Park weighbridge was not operational during approximately 15 days between 14 September 2022 and 21 September 2023 and as a result disposal dockets were not available for these days.

JBS&G concluded in the VR that "*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.*".

13.6.3. Auditor's Opinion

The Auditor considers that the waste management that was assessed as part of the remedial/development works was undertaken in general accordance with the relevant guidelines and regulations. There were some discrepancies between the volumes classified and disposed, however this is considered to be acceptable as set procedures for waste disposal were implemented during the works.

13.7. VENM and Other Imported Materials

Based on the information in **Section 11.3.3**, the Auditor is of the opinion that the materials imported to the site are suitable for onsite use (from a contamination perspective) and generally have been imported in accordance with relevant legislation.

13.8. Licenses

Based on the information presented in the VR, excavation and removal of the asbestos UFs was conducted by Mann Group NSW (Auswide Operations Pty Ltd) who hold a Class A Asbestos

Removal Licence (SafeWork Licence AD212715). An occupational hygienist/Licenced Asbestos Assessor (LAA) from Airsafe Laboratories Pty Ltd (Airsafe) undertook inspections following removal works, asbestos air monitoring and issued a surface clearance inspection certificate confirming the areas were free from visual asbestos contamination on the ground surface. Copies of the appropriate licences were appended to the Validation Reports. In addition, the Auditor checked the Service NSW 'Verify a Licence' register (https://verify.licence.nsw.gov.au/home) on 3 December 2024 and notes that Auswide Operations Pty Ltd Trading as Mann Group NSW are a current licensed asbestos removal contractor.

13.9. Asbestos Register and Asbestos Management Plan

As noted in **Section 1.4**, CPBG have prepared an AMP for the SMWSA SBT works which has been reviewed by the Auditor. The AMP and associated Asbestos Register will be provided to Sydney Metro at the conclusion of the project. They will document areas where asbestos remains at concentrations below the human health criteria and the management procedures to be implemented.

13.10. Conflict of Interest

The Auditor has considered the potential for a conflict of interest in accordance with the requirements of Section 3.2.3 of the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*.

The Auditor considers that there are no conflicts of interest, given that:

1. The Auditor is not related to a person by whom any part of the land is owned or occupied.
2. The Auditor does not have a pecuniary interest in any part of the land or any activity carried out on any part of the land.
3. The Auditor has not reviewed any aspect of work carried out by, or a report written by, the site auditor or a person to whom the site auditor is related.

14. CONCLUSIONS AND RECOMMENDATIONS

Based on the results documented in the VR, JBS&G concluded that *"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."*.

Based on the information presented in consultant reports and observations made on site, and following the Decision-making process for assessing urban redevelopment sites in NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, the Auditor concludes that the site is suitable for operation as a services facility to support construction activities for the underground tunnel portions of the SMWSA.

In accordance with Conditions E98 and E99 of the development consent, an Unexpected Contaminated Land and Asbestos Finds Procedure should be prepared and implemented during future construction of the site.

Fill containing asbestos at concentrations below the human health criteria is covered in geofabric, fenced off from the rest of the site and signposted. Management of these areas is to be undertaken in accordance with the AMP.

The suitability of any materials imported during future development or construction works should be verified in accordance with relevant guidelines, regulations, and the intended land use exposure scenario.

Groundwater has not been assessed for any beneficial re-use. Any future use of groundwater would require appropriate assessment and regulatory approvals from the NSW Office of Water.

15. OTHER RELEVANT INFORMATION

This Audit was conducted on the behalf of CPBG for the purpose of assessing whether the land is suitable for the proposed operation as a services facility to support construction activities for the underground tunnel portions of the SMWSA, i.e. a "Site Audit" as defined in Part 1 Clause 4 (1) (definition of a 'site audit' (b)(iii)) of the CLM Act.

This summary report may not be suitable for other uses. The consultants included limitations in their reports. The Audit must also be subject to those limitations. The Auditor has prepared this document in good faith, but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check.

The Auditor has relied on the documents referenced in **Section 1** of the Site Audit Report in preparing the Auditor's opinion. If the Auditor is unable to rely on any of those documents, the conclusions of the audit could change.

It is not possible in a Site Audit Report to present all data which could be of interest to all readers of this report. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

Appendix A
Attachments

Attachment 1: Site Audit Boundary
Attachment 2: Site Locality
Attachment 3: DSI Site Layout
Attachment 4: Technical Paper AECs
Attachment 5: EES DSI Soil Sample Investigation Locations
Attachment 6: Previous Investigation Sample Locations
Attachment 7: DGA Sample Locations
Attachment 8: HGG Monitoring Well Locations
Attachment 9: DSI Groundwater and HGG Monitoring Well Locations
Attachment 10: Location of Unexpected Finds

Attachment 1: Site Audit Boundary

Legend

Approximate Site Boundary

JBS&G

Job No: 63723

Client: CPB Contracting

Version: R13 Rev A	Date 11/09/2024
Drawn By: IA	Checked By: EH

Scale 1:2,500

0 20 40

metres

Coord. Sys. GDA 1994 MGA Zone 56

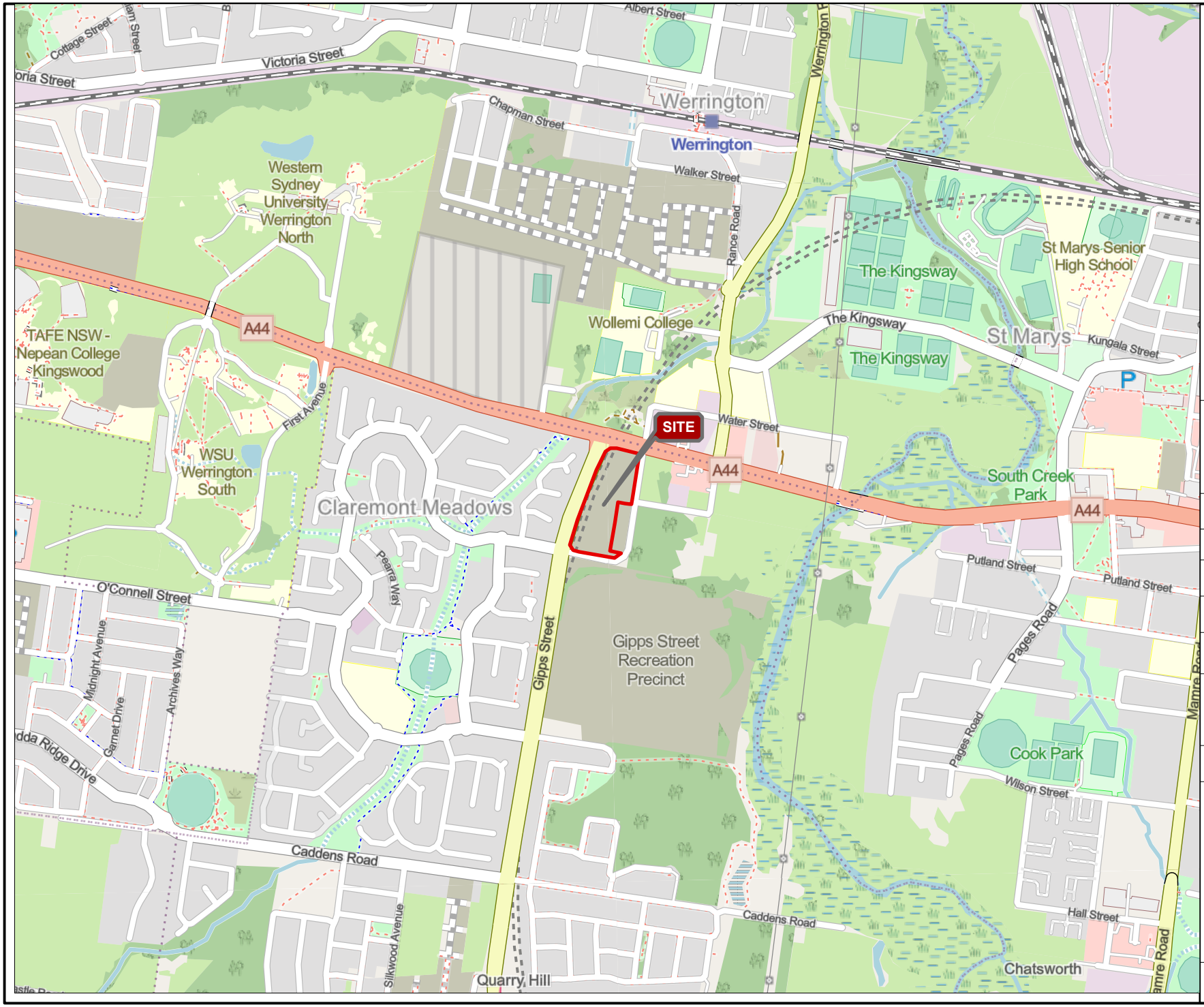
1-17 Gipps Street
Claremont Meadows, NSW

SITE LAYOUT

FIGURE 2

File Name: 63723_WSA_OrchardHill_R13_RevA
Reference: www.nearmap.com.au (Capture Date 2024/07/11)

Attachment 2: Site Locality



Legend

Approximate Site Boundary

JBS&G

Job No: 63723	
Client: CPB Contracting	
Version: R13 Rev A	Date 11/09/2024
Drawn By: IA	Checked By: EH

Scale 1:15,031

0 140 280

metres

Coord. Sys. GDA 1994 MGA Zone 56

1-17 Gipps Street
Claremont Meadows, NSW

SITE LOCATION

FIGURE 1

File Name: 63723_WSA_OrchardHill_R13_RevA
Reference: www.nearmap.com.au (Capture Date 2024/07/11)

Attachment 3: DSI Site Layout

Legend

- Site Boundary
- Road-base Gravel at surface
- Stockpiles
- Former Gipps Stree tLandfill (approximate)

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Observed Site Layout

Client: Road and Rail Excavations

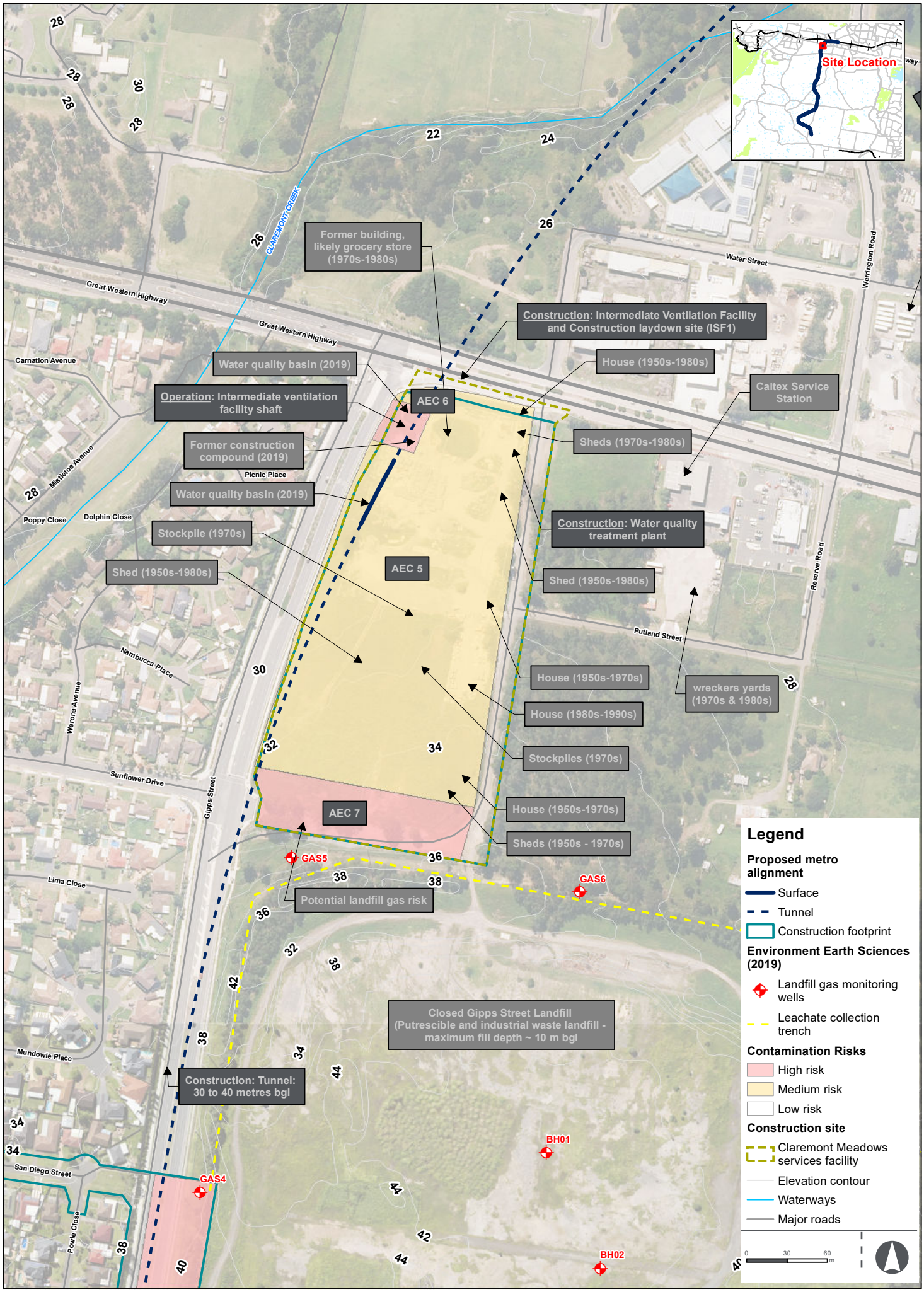
Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG | Scale: As Shown | Job No: 122045

Drawn By: SG | Date: July 2022

Figure 2

Attachment 4: Technical Paper AECs



Sydney Metro – Western Sydney Airport

Claremont Meadows Services Facility contamination sources and risk ranking

*HBM - Potential hazardous building materials
Indicative only, subject to design development

Figure A3

Attachment 5: EES DSI Soil Sample Investigation Locations

Legend

- Approximate Site Boundary

Site Features

- General Solid Waste (EES, 2022d)
- Special Waste - Asbestos Waste (EES, 2022d)
- Small Footprint
- Stockpile Footprint

Sample Locations (DSI, EES 2022b)

- Small Stockpile
- Stockpile Footprints
- Test pits

JBS&G

Job No: 63723

Client: CPB Contracting

Version: R13 Rev A	Date 11/09/2024
Drawn By: IA	Checked By: EH

Scale 1:1,800

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

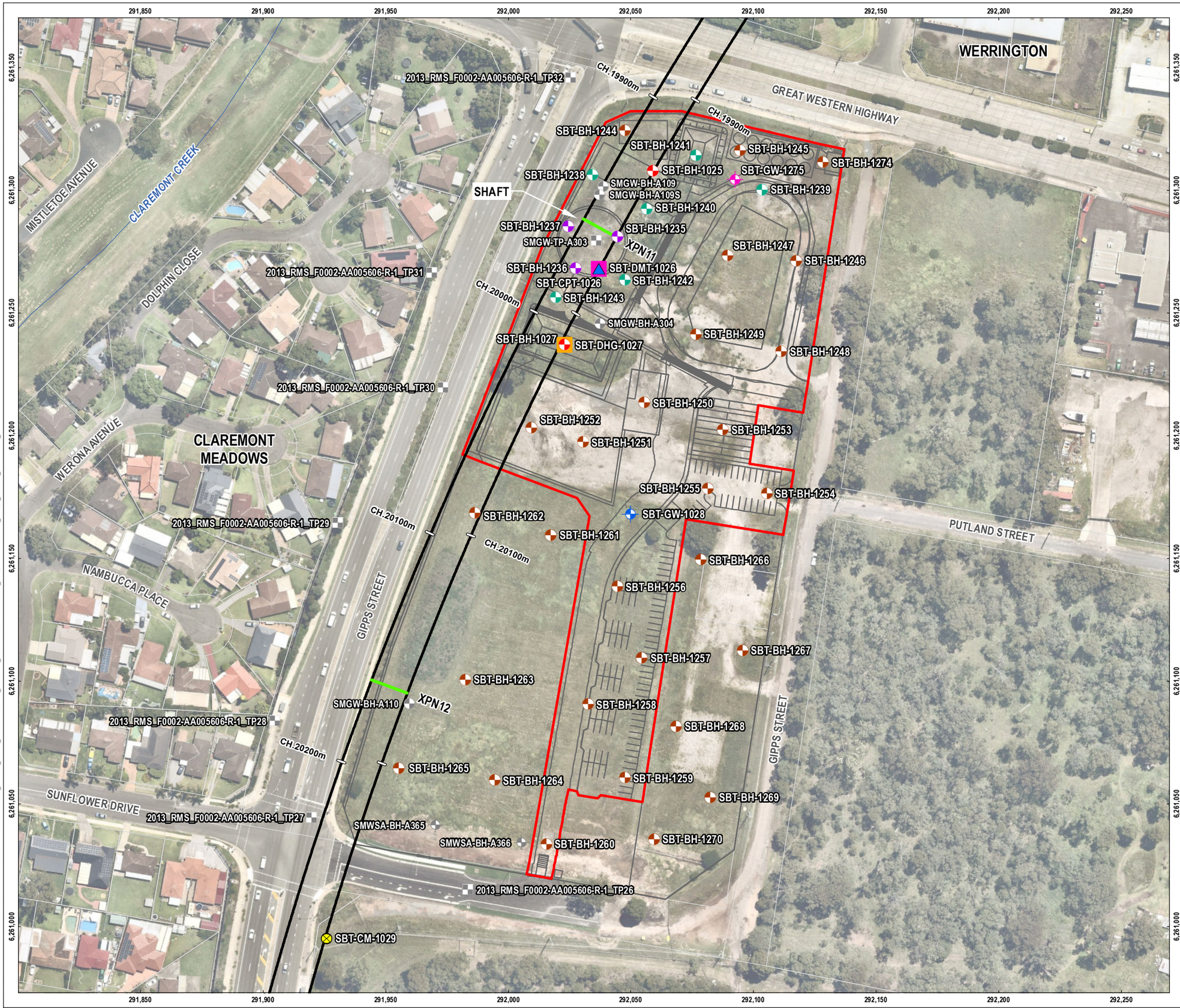
1-17 Gipps Street
Claremont Meadows, NSW

SAMPLE LOCATIONS AND WASTE CLASSIFICATION AREAS

FIGURE 3

File Name: 63723_WSA_OrchardHill_R13_RevA
Reference: www.nearmap.com.au (Capture Date 2024/07/11)

Attachment 6: Previous Investigation Sample Locations



CPB CONTRACTORS

Ghella 1894 5 Generations of Tunnelers

LEGEND

Additional Contaminated Land Location
- Borehole (1 m)
- Borehole (2 m)
- Borehole (Deep)
- Groundwater Monitoring Well

Additional Geotechnical/Hydrogeological Location
- Borehole
- Contamination Hole
- Cone Penetration Test
- Groundwater Monitoring Well
- Down Hole Geophysics (Seismic)
- Flat Dilatometer Test

Existing Investigation Location
- Borehole
- Test Pit
- Tunnel Alignment
- Tunnel Alignment - Chainage
- Tunnel Alignment - Cross Passage
- Claremont Meadows Services Facility Site Layout
- Non-perennial Watercourse
- Cadastral Boundary
- Construction Footprint

SOURCE
Contaminated land locations, additional investigations, and construction footprint boundary from Tetra Tech Coffey.
Existing investigations and alignment supplied by CPBG.
Cadastre and watercourses from DFSI.
Aerial imagery from Nearmap (capture date 18-02-2022).

N

0 25 50 m

SCALE **1:1,500**
PAGE SIZE: **A3**
PROJECTION: **GDA2020 MGA Zone 56**

CPB - GHELLA

WESTERN SYDNEY AIRPORT
STATION BOXES AND TUNNELLING WORKS

FIGURE 1

Contaminated Land Locations Claremont Meadows

TETRA TECH COFFEY

DATE: **21.03.22** PROJECT: **754-SYDGE292575** FILE: **292575_SAQP_F001_GIS_REVA**

Attachment 7: DGA Sample Locations

Legend

- Borehole locations - Data gap investigation
- Test pit locations (EES, Mar 2022)
- Approximate footprint of potential historical service station
- Trench
- Location of proposed water treatment plant
- Site boundary

0 5 10 15 m

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Sampling locations

Client: Road and Rail Excavations

Location: Claremont Meadows Services Facility - 1-17 Gipps St, Claremont Meadows NSW

Project Manager: Sam Goldsmith | Scale: As Shown | Job No: 122045

Drawn By: Karin Azzam | Date: September 2021

Figure 2

Attachment 8: HGG Monitoring Well Locations

References:
Lot boundaries - downloaded from SixMaps 13/02/2023
Imagery - NearMap 12 January 2021

N
0 40
Metres
1:2,000 at A4
GDA2020 MGA Zone 56

EESI Environmental Earth Sciences International

Title:	Site Layout
Client:	Road and Rail Excavations
Location:	1-17 and 19 Gipps Street, Claremont Meadows, NSW 2747
Project Manager:	Sam Goldsmith
Scale:	As noted
Job No:	122045
Drawn By:	The Map Lass Pty Ltd
Date:	15 February 2023

Figure 2

Document Location D:\Projects\EES\EESI 2023-002 122045 Claremont Meadows\Output\122045-001-B (Site Layout).mxd

Attachment 9: DSI Groundwater and HGG Monitoring Well Locations

Legend

- Site Boundary
- Excluded Area
- Groundwater Bore
- Soil/ Rock Bore
- Gas Bore
- Unknown Bores
- Former Gipps Street Landfill (approximate)

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Groundwater and Hazardous Ground Gas Investigation Locations

Client: Road and Rail Excavations

Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG	Scale: As Shown	Job No: 122045
Drawn By: SG	Date: June 2022	

Figure 6

Attachment 10: Location of Unexpected Finds

Legend

Approximate Site Boundary

Unexpected Finds

Car Park CMSF

North Area CMSF

JBS&G

Job No: 63723

Client: CPB Contracting

Version: R13 Rev A | Date 12/09/2024

Drawn By: IA | Checked By: EH

Scale 1:1,750

0 10 20

metres

Coord. Sys. GDA 1994 MGA Zone 56

1-17 Gipps Street
Claremont Meadows, NSW

LOCATION OF UNEXPECTED FINDS

FIGURE 4

File Name: 63723_WSA_ClaremontMeadows_R13_RevA
Reference: www.nearmap.com.au (Capture Date 2024/07/11)

Appendix B
Site Audit Statement

NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. TO-095-A5

This site audit is a:

☒ statutory audit

☐ non-statutory audit

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name: [redacted]

Company: Ramboll Australia Pty Ltd

Address: Level 3, 100 Pacific Highway, North Sydney

Postcode: 2060

Phone: [redacted]

Email: [redacted]@ramboll.com

Site details

Address: Claremont Meadows Services Facility (Sydney Metro Western Sydney Airport), Part 1-17 Gipps Street, Claremont Meadows, NSW

Postcode: 2747

Property description

(Attach a separate list if several properties are included in the site audit.)

Part Lot 1601 Deposited Plan (DP) 1282557 (See survey and boundary co-ordinates at the end of Part I)

Local government area: Penrith City Council

Area of site (include units, e.g. hectares): 4.0 hectares

Current zoning: R3 (Medium Density Residential) over the majority of the site and E3 (Productivity Support) fronting The Great Western Highway under the Penrith Local Environmental Plan (LEP) 2010

Regulation and notification

To the best of my knowledge:

☐ **the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985,* as follows: (provide the no. if applicable)

- ☐ Declaration no.
- ☐ Order no.
- ☐ Proposal no.
- ☐ Notice no.

☒ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☐ the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

☒ the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.

Site audit commissioned by

Name: [redacted]

Company: CPB Contractors Pty Limited and Ghella Pty Ltd (CPBG) Joint Venture

Address: Level 2, 177 Pacific Highway, North Sydney

Postcode: 2060

Phone: [redacted]

Email: [redacted].com.au

Contact details for contact person (if different from above)

Name: [redacted]

Phone: [redacted]

Email: [redacted]

Nature of statutory requirements (not applicable for non-statutory audits)

☐ Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)

☐ Requirements imposed by an environmental planning instrument (please specify, including date of issue)

☒ Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)

Critical State Significant Infrastructure approval 10051, issued 23 July 2021 by the Minister for Planning and Public Spaces

☐ Requirements under other legislation (please specify, including date of issue)

Purpose of site audit

☒ **A1** To determine land use suitability

Intended uses of the land: Ongoing services facility to support construction activities for the underground tunnel portions of the Sydney Metro Western Sydney Airport project

OR

☐ **A2** To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land:

OR

(Tick all that apply)

☐ **B1** To determine the nature and extent of contamination

☐ **B2** To determine the appropriateness of:

- ☐ an investigation plan
- ☐ a remediation plan
- ☐ a management plan

☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

☐ **B4** To determine the compliance with an approved:

- ☐ **voluntary management proposal** or
- ☐ **management order** under the *Contaminated Land Management Act 1997*

☐ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land:

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

CPB Contractors Pty Limited and Ghella Pty Ltd (CPBG)

Tetra Tech Major Projects Pty Ltd (TTMP)

Douglas Partners Pty Ltd (Douglas)

EDP Consultants Pty Ltd (EDP)

Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES)

JBS&G Australia Pty Ltd (JBS&G)

Titles of reports reviewed:

‘Sydney Metro – Western Sydney Airport Technical Paper 8 Contamination’, October 2020, M2A

‘Ground Gas Monitoring and Assessment, Proposed Recreational Development, Gipps Street, Claremont Meadows, NSW’, 25 March 2021, Douglas

‘Claremont Meadows, Sampling Analysis Quality Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works’, 30 March 2022, TTMP

‘Waste Classification and Onsite Re-Use Assessment of Stockpiled Soil Material – 1-17 Gipps Street, Claremont Meadows NSW’, 13 April 2022, EDP

‘Sampling Analysis and Quality Plan Addendum – Claremont Meadows Services Facility, Sydney Metro Western Sydney Airport’, 27 May 2022, EES

‘Additional Ground Gas Investigation Works, Proposed Recreational Development, Gipps Street, Claremont Meadows’, 8 July 2022, Douglas

‘Detailed Site Investigation for Claremont Meadows Services Facility’, 27 July 2022, EES

‘Remediation Action Plan, 1-17 Gipps Street, Claremont Meadows NSW’, 26 September 2022, EES

‘Hydrogeological Report (Project-wide), Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works’, 23 February 2023, TTMP

‘Hazardous Ground Gas Risk Assessment - Claremont Meadows Services Facility’, 6 April 2023, EES

‘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’, 13 April 2023, EES

‘Factual Gas Monitoring Report No.1 (June 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW’, 16 June 2023, EES

‘Factual Gas Monitoring Report No.2 (July 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW’, 14 July 2023, EES

‘Factual Gas Monitoring Report No.3 (August 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW’, 10 August 2023, EES

‘Factual Gas Monitoring Report No.4 (September 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW’, 14 September 2023, EES

‘Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF) in Claremont Meadows, NSW’, 25 September 2023, EES

‘Factual Gas Monitoring Report No.5 (October 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW’, 12 October 2023, EES

‘Asbestos Management Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Work’ Revision C, 22 February 2024, CPBG

‘NSW (Off-Airport) Soil and Water Management Sub-Plan, Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works’ (Revision 2), 15 August 2024, CPBG

‘Validation Report, Claremont Meadows Service Facility’, 21 November 2024, JBS&G

Other information reviewed, including previous site audit reports and statements relating to the site:

Site audit report details

Title:	Site Audit Report – Claremont Meadows Services Facility SBT Works, Sydney Metro Western Sydney Airport
Report no.:	TO-095-A5 (Ramboll Ref: 318001447-002) Date: 20 December 2024

GIPPS ST

PROPERTY BOUNDARY

E=291932.607
N=6261049.568

E=291952.321
N=6261115.038

E=291937.947
N=6261033.263

E=291977.847
N=6261183.410

E=292013.652
N=6261276.602

R=15.200m

Capping Beam

E=292034.038
N=6261279.259

E=292039.753
N=6261327.710

E=292049.969
N=6261332.242

E=292060.777
N=6261332.243

E=292070.777
N=6261332.244

PORTION
N3

PROPERTY BOUNDARY

GREAT WESTERN HIGHWAY

E=292072.581
N=6261165.843

E=292048.903
N=6261013.797

E=292127.443
N=6261319.013

E=292125.173
N=6261309.274

E=292052.554
N=6261037.243

E=292125.428
N=6261242.183

E=292135.611
N=6261306.841

E=292112.175
N=6261159.650

E=292137.182
N=6261316.743

E=292092.176
N=6261031.073

GIPPS ST

E=292064.209
N=6261011.107

PUTLAND ST

Sydney Metro WSA – CLAREMONT MEADOWS

SUREX SURVEYORS

HANDOVER BOUNDARIES

Portion N3

SURVEYOR : RS	DATE: 30/08/2024
SURVEY REF: 3156_Claremont_N3_Portion-Boundary_R2.pro	Rev : 3

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
    - (B1) the nature and extent of contamination, and/or
    - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
    - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
    - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
    - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ ~~Residential, including substantial vegetable garden and poultry~~

☐ ~~Residential, including substantial vegetable garden, excluding poultry~~

☐ ~~Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

☐ ~~Day care centre, preschool, primary school~~

☐ ~~Residential with minimal opportunity for soil access, including units~~

☐ ~~Secondary school~~

☐ ~~Park, recreational open space, playing field~~

☐ ~~Commercial/industrial~~

☒ Other (please specify):

Ongoing use as a services facility to support construction activities for the underground tunnel portions of the Sydney Metro Western Sydney Airport project

~~OR~~

☐ ~~I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.~~

Overall comments:

The Claremont Meadows Services Facility (CMSF) has been constructed by CPBG as part of the Station Boxes and Tunnelling Works (SBT Works) and has been used as a services facility to support construction activities for the underground tunnel portions of the Sydney Metro Western Sydney Airport (SMWSA) and included a shaft, as well as temporary construction facilities, a water treatment plant and amenities.

Intrusive investigations of soil and groundwater did not identify contamination above human health criteria for a commercial/industrial land use. Hazardous ground gas (HGG) screening was also undertaken to assess potential migration of HGG onto the site from an adjacent landfill, which was not found to be of concern.

During construction works two unexpected finds (UFs) relating to asbestos in soil were identified which required management. The UFs were adequately managed/remediated via offsite disposal. Validation was adequate to demonstrate successful removal.

Asbestos was detected through laboratory assessment as fibrous asbestos (FA) in two surface samples of fill material at concentrations below the adopted human health screening level and were deemed to pose a low risk to receptors under the proposed land use. These impacts remain at the site covered in geofabric, fenced off from the rest of the site and signposted. Management of these areas is to be undertaken in accordance with the Asbestos Management Plan (AMP).

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

EMP details

Title:

Author:

Date: No. of pages:

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Section B

Purpose of the plan[4] which is the subject of this audit:

_____

_____

_____

I certify that, in my opinion:

(B1)

☐ The nature and extent of the contamination **has** been appropriately determined

☐ The nature and extent of the contamination **has not** been appropriately determined

AND/OR (B2)

☐ The investigation, remediation or management plan **is** appropriate for the purpose stated above

☐ The investigation, remediation or management plan **is not** appropriate for the purpose stated above

AND/OR (B3)

☐ The site testing plan:

☐ **is** appropriate to determine

☐ **is not** appropriate to determine

if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

AND/OR (B4)

☐ The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):

☐ **have** been complied with

☐ **have not** been complied with.

*voluntary management proposal no. _____

**management order no. _____

AND/OR (B5)

☐ The site **can be made suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

- ☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry
- ☐ Day care centre, preschool, primary school
- ☐ Residential with minimal opportunity for soil access, including units
- ☐ Secondary school
- ☐ Park, recreational open space, playing field
- ☐ Commercial/industrial
- ☐ Other (please specify):

IF the site is remediated/managed* in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title

Plan author

Plan date No. of pages

SUBJECT to compliance with the following condition(s):

Overall comments:

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. 1505

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed 

Date 20 December 2024

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**:
  nswauditors@epa.nsw.gov.au or as specified by the EPA

  AND
- the **local council** for the land which is the subject of the audit.

Appendix C
Correspondence

RAMBOLL

ENVIRONMENT
& HEALTH

19 August 2022

CPB Contractors Pty Ltd and Ghella Pty Ltd
Attn: [redacted]
Level 2, 177 Pacific Highway
North Sydney NSW 2060

By email:[redacted].com.au

Dear Stuart

RE: INTERIM AUDIT ADVICE LETTER NO.1 - REVIEW OF DETAILED SITE INVESTIGATION, PROPOSED SYDNEY METRO WESTERN SYDNEY AIRPORT CLAREMONT MEADOWS SERVICES FACILITY, 1-17 GIPPS STREET, CLAREMONT MEADOWS NSW

Ramboll Australia Pty Ltd
Level 3, 100 Pacific Highway
PO Box 560
North Sydney NSW 2060

T +61 2 9954 8100
www.ramboll.com

Ref: 318001447-002

Audit Number: TO-095

1. Background and Objective

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, on behalf of CPB Contractors Pty Ltd and Ghella Pty Ltd (CPBG), I am conducting an Audit (TO-095) under the NSW *Contaminated Land Management Act 1997* (CLM Act) in relation to the proposed Claremont Meadows Services Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows NSW (Part Lot 100 DP1275138) which forms part of the Sydney Metro - Western Sydney Airport (SMWSA) rail project. The site locality is shown on Attachment 1.

The Audit is required under Conditions E94, E96 and E97 of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces. The audit is therefore statutory. The overall objective of the audit is to enable a Section A1 or A2 site audit statement (SAS) and supporting site audit report (SAR) to be prepared that confirms the site is suitable for the proposed development. This initial review has been undertaken to provide an independent review of the detailed site investigation (DSI) of the site. The review is documented in this Interim Audit Advice (IAA) letter (IAA1), which was prepared to satisfy Conditions 12.9 (c) (vi and vii) of the deed agreed between Transport for NSW and CPBG.

The new SMWSA railway line is around 23 kms in length, between St Marys in the north and the Western Sydney Aerotropolis in the south. The alignment passes through the Western Sydney International Airport (on-airport Commonwealth land). The project includes construction of new stations, a train stabling and maintenance facility, rail infrastructure facilities, tunnels, bridges, viaducts and associated ancillary infrastructure. It is understood that the site will be used as an intermediate service facility to support construction activities for the underground tunnel portions of the SMWSA and therefore will include a shaft, as well as temporary construction facilities and amenities.

Ramboll Australia Pty Ltd
ACN 095 437 442
ABN 49 095 437 442

The site occupies an area of approximately 4 hectares (ha) and is located in the City of Penrith local government area. The current zoning of the site is R3 (Medium Density Residential) and B6 (Enterprise Corridor) under the Penrith Local Environmental Plan 2010.

The site has been subject to previous preliminary intrusive investigations of soil and groundwater. A sampling analysis quality plan (SAQP) for the DSI was prepared by Tetra Tech Major Projects Pty Ltd (TTMP) dated 30 March 2022 which was reviewed by the Auditor. The SAQP noted that previous investigations conducted at the site were limited in scope. The SAQP was specific to the shaft and surface construction activities, and did not considered the post-construction use of the site. Review comments on the SAQP were issued by the Auditor by email on 13 May 2022. Subsequently, Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES) prepared an SAQP Addendum dated 27 May 2022 which is understood to have considered the Auditor comments. The SAQP Addendum was not reviewed by the Auditor.

Previous investigations were summarised in both the SAQP and SAQP Addendum. The SAQP included a summary of the site history, which noted the following:

- The site was in private ownership from 1905 to 1974 when it was purchased by the Housing Commission of NSW. The land title was then transferred to The Land Commission of New South Wales. The site was purchased by Roads and Maritime Services (now Transport for NSW) in 2012.
- Four houses and associated outbuildings/sheds were previously located along the eastern boundary of the site between 1955 and the 1970s. The number of houses had been reduced to one by the 1980s and this house was removed in the 2000s. The site appears to have been used as a rural residential area over this time period.
- A building with two access driveways connecting to the Great Western Highway was present at the northern end of the site in the 1970s and 1980s. Based on its configuration it was inferred as a potential service station site, however, it may have been used for other commercial or residential purposes.
- From 2012 the site was cleared vacant land and remained in this configuration until approximately 2015.
- Construction areas including buildings/sheds, parking, laydown areas, sediment basins and stockpiles were present over the majority of the site from 2015 to 2017, and in the northern half of the site from 2015 to the 2020s. It has been assumed that the site was in use to support road construction projects based on ownership by Transport NSW and construction activities taking place along Gipps Street adjacent to the CMSF site.
- The Gipps Street Landfill is located to the south of the site. The landfill was developed circa 1956 and is now closed. Several service stations are present to the east of the site.
- A stockpile was observed along the western portion of the site. The stockpile was heavily overgrown and difficult to inspect. The dimensions of the stockpile were estimated visually to be approximately 50 m long, 20 m wide, 3 m high. Anecdotally this stockpile was understood to be contaminated with asbestos and perfluoroalkyl and polyfluoroalkyl substances (PFAS). The stockpile was subsequently removed and the footprint sampled during the DSI.

The SAQP and SAQP Addendum noted that previous investigations did not identify contamination above human health criteria for a commercial/industrial land use. Trace concentrations of PFAS were reported in natural materials at the southern end of the site. Petroleum hydrocarbons (total recoverable hydrocarbons, ethylbenzene and xylenes) were found at depth (1.5, 12 and 19 metres below ground level (mbgl)) at two locations in the northwest (BH-A304) and south (BH-A366) of the site and may indicate a potential source of contamination (e.g. the potential service station site).

2. Scope of Work

The following report was reviewed:

- 'Detailed Site Investigation for Claremont Meadows Services Facility', dated 27 July 2022, EES (*the DSI*)

I provided review comments on a previous version of the DSI (Version 1 dated 22 June 2022) by email on 6 July 2022 and received responses from EES by email as well as a revised report (dated 27 July 2022) on 28 July 2022. Additional review comments were provided on the revised report by email on 3 August 2022 and responses by EES were provided by email along with the updated DSI (dated 27 July 2022, date unchanged from previous version) on 8 August 2022.

I reviewed the DSI against the requirements of the following:

- NSW EPA (2016) '*Environmental Guidelines, Solid Waste Landfills'*
- NSW EPA (2017) '*Guidelines for the NSW Site Auditor Scheme (3rd Edition)'*
- NSW EPA (2020) '*Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'*
- NSW EPA (2020) '*Contaminated Land Guidelines, Assessment and management of hazardous ground gases'*
- National Environment Protection Council (NEPC) '*National Environment Protection (Assessment of Site Contamination) Measure 1999',* as Amended 2013 (NEPM, 2013)
- Western Australia Department of Health (WA DoH) (2021) '*Guidelines for Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'
- Chapter 4 Remediation of Land in the *Resilience and Hazards State Environment Planning Policy (SEPP) 2021* (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land'*
- HEPA (2020) *'PFAS National Environmental Management Plan, Version 2.0 – January 2020'*

3. Review of DSI

3.1. DSI Scope of Work

EES undertook the DSI over periods in April, May and July 2022 which included sampling of insitu soil, stockpiles, groundwater and hazardous ground gas (HGG). Sample locations are shown in Attachments 2 and 3. The soil sampling was undertaken from 31 test pits (TP1 to TP31) excavated across the site to a maximum depth of 4.0 mbgl. Additional soil sampling was undertaken from greater depths in four boreholes (BH1235 to BH1237 and GW1028) targeting the location of the shaft. The groundwater assessment included the installation and sampling of one new groundwater well (GW1028), along with sampling from two existing wells (SMGW-BH-A109S and SMGW-BH-A365). The HGG screening was undertaken from a previous well installed at the site (SMGW-BHA366). Eight test pits (TP201 to TP208) were excavated to 1 mbgl within the footprint of the former stockpile in the southwest of the site, while six test pits (MP1 to MP6) were excavated 0.3 m below the surface of a small stockpile located in the northwest of the site.

Soil samples collected from test pits were generally collected at pre-determined intervals within the soil profile (0.1, 0.5, 1.0 mbgl then one sample for each additional metre below) or where changes in the soil profile were noted. Soils were field screened using a calibrated photoionisation detector (PID) device to provide a semi-quantitative assessment of volatile organic compounds (VOC) within soil pore spaces that may indicate potential contamination.

The new deep groundwater monitoring well was constructed of class 18 uPVC screen and casing to depth of 21 mbgl with a long (6 m) screen due to the low permeability and porosity of the fine-grained sedimentary stratigraphy. The screen was 1 mm machine slotted with 2-3 mm graded sand used to create a filter to 0.5 m above the top of the screen section. Above the sand a 0.5 m bentonite clay plug was installed to prevent groundwater from overlying water bearing zones entering the screen along with top-down water ingress through the bore annulus. The bore annulus was then grouted to the surface and finished with a steel monument. Following installation, the groundwater monitoring well along with previously installed wells were developed using a dedicated PVC bailer to remove water introduced through drilling. Waterra foot-valves were used to purge the monitoring wells and facilitate collection of samples to ensure that groundwater representative of aquifer conditions was being sampled.

The HGG screening was undertaken using a calibrated GFM436 handheld gas analyser to assess for concentrations of bulk hazardous ground gases (methane, carbon dioxide and oxygen) along with trace carbon monoxide and hydrogen sulfide and additional parameters such as borehole flow and atmospheric pressure. Flow was measured prior to assessing composition, connecting to the quick connect fittings on the gas cap to ensure representative sampling without external atmospheric influence.

Generally, two soil samples per test pit were submitted for laboratory analysis for various combinations of metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), organophosphorus pesticides (OPP), phenolic compounds, polychlorinated biphenyls (PCB) and asbestos (presence/absence). In addition, four samples obtained from the footprint of the former stockpile were analysed for PFAS and one sample for asbestos fines/fibrous asbestos (AF/FA). 10 Litre samples were obtained from the small stockpile only and were sieved in the field with a 7 mm metal sieve for the presence of asbestos containing material (ACM). Groundwater samples were analysed for metals, TRH, BTEX, OCP and ionic balance.

Auditor's Opinion: The scope of work undertaken for the DSI was generally adequate to provide an assessment of contamination at the site and was generally in accordance with the SAQP and SAQP Addendum and adequate to meet the objective of characterising contamination for construction purposes. My review comments on the SAQP (email dated 13 May 2022) recommended that the DSI scope should include 500 mL and 10 Litre bulk sampling in accordance with NEPM (2013) for the assessment of asbestos, however this was generally not undertaken.

Investigation locations did not target the potential former service station in the north of the site. This was considered a data gap and the DSI proposed further investigation by excavation of test pits during construction. Further assessment of HGG was also considered to be required.

3.2. DSI Results

The reported concentrations of contaminants in soil were below the laboratory's limit of reporting (LOR) and the adopted criteria considering a commercial/industrial land-use scenario. The sample locations undertaken did not identify widespread or visible asbestos/ACM, however EES noted that the vegetation ground cover on the surface in areas of the site may have reduced the ability to identify surficial asbestos/ACM.

Asbestos was detected through laboratory assessment as FA in two surface samples (TP15_0.05 and TP207_0.05) however concentrations reported were below the adopted HSL-D assessment criteria. The DSI noted that an asbestos management plan (SMWSASBT-CPG -1NL-NL000-SF-PLN-000024) had been prepared to ensure appropriate management of any further potential unidentified asbestos impacts in soil encountered during the construction stage.

Deeper fill material was identified in TP4 and TP5 and was considered by EES to have been placed relatively recently, likely due to the visible infilling of temporary onsite retention/ sediment dams when the site was used for construction purposes.

The depth to groundwater measured in two of the three monitoring wells was 2.00 mbgl (SMGW-BH-A190S) and 3.14 mbgl (SMGW-BH-A365). The third well (GW1028) was not sampled, however the DSI did not report why. EES considered that groundwater is inferred to flow in a northerly direction aligning with regional topography. All organic compounds (TRH, BTEX, OCP and OPP) were reported below the LOR in the groundwater samples submitted. The majority of dissolved metals were below the LOR with the exception of zinc, iron and manganese, with zinc and manganese above the adopted site assessment criteria. These exceedances were considered by EES to be a likely reflection of natural background conditions and not contamination from an on-site (or off-site) source.

The concentrations of methane measured during the HGG screening were reported below the minimum resolution of the handheld gas analyser (0.1% v/v), while the flow rate was also below the minimum resolution of 0.1 L/hr. Carbon dioxide was reported at 18% v/v, which is above the NSW EPA (2016) threshold value of 1.5% v/v above background values (there is currently no background for the site). EES noted that the sampling conditions for the HGG screening were not considered to represent a 'worst-case' scenario.

Based on the results of the DSI, EES concluded "*Based upon the results and findings of this assessment the site is considered to be suitable for use as a construction site, under a commercial/ industrial land use scenario without further assessment or remediation required. The proposed site works are considered unlikely to disturb moderate to high-risk contaminated land.*".

EES also concluded that "*In view of the results and conclusions of the DSI, the following recommendations are made:*

- *Areas that have been excluded for* (sic) *the site boundary as defined for this assessment should be investigated if they become part of the construction site at a later stage of the project.*
- *A construction environmental management plan (CEMP) should be prepared and implemented with sufficient details to address managing asbestos soil contamination, waste material, and unexpected finds. To this end Environmental Earth Sciences NSW is aware of the following Preparatory CEMP - SMWSASBT-CPG-1NL-EV-PLN-00002 and an asbestos management plan - SMWSASBT-CPG-1NL-NL000-SF-PLN-000024*
- *All management plans should be implemented prior to bulk earth works commencing to mitigate against potential risks.*
- *Caution should be taken during top-soil stripping and clearing and grubbing as from the site's history, unidentified impacts (such as ACM) may be present or localised in the shallow sub-surface.*
- *Any asbestos removal works should be undertaken by a suitably licensed asbestos removalist (LAR) and following removal a clearance certificate should be issued to demonstrate all impacts have been suitably managed/ removed.*
- *Confirmatory sampling of soils via a targeted test pitting assessment in the vicinity of the potential former service station (near north boundary) to close out potential for unidentified impacts from potential bulk fuel storage and distribution. Any additional assessment should be appropriately documented in accordance with NSW EPA [2020].*
- *The potential effect of tunnelling on groundwater should be assessed as changes in groundwater levels may induce/ enhance leachate, or potentially hazardous ground gas migration from the former Gipps Street landfill which is located ~70 m to the south of the site.*
- *An assessment of hazardous ground gases in accordance with NSW EPA guidelines should be completed.*

- *Waste material needs to be disposed in accordance with the POEO Act [Protection of the Environment Operations Act 1997] based on the waste classifications herein, ensuring waste is disposed of to suitably licenced facilities.*"

Auditor's Opinion: The scope of work undertaken for the DSI was generally adequate to assess contamination likely to be disturbed during shaft and surface construction activities. The scope of work was not suitable to demonstrate the suitability of the site for commercial/industrial land use.

The assessment of asbestos was not undertaken in accordance with NEPM (2013) and, given the site history, AF/FA detections and limitations of the site investigation, it is considered reasonably likely that asbestos (ACM and/or AF/FA) is present in fill material. The DSI recommends that "*A construction environmental management plan (CEMP) should be prepared and implemented with sufficient details to address managing asbestos soil contamination, waste material, and unexpected finds. To this end Environmental Earth Sciences NSW is aware of the following Preparatory CEMP - SMWSASBT-CPG-1NL-EV-PLN-00002 and an asbestos management plan - SMWSASBT-CPG-1NL-NL000-SF-PLN-000024.*". I have reviewed the asbestos management plan (AMP) (Rev A dated 2 February 2022) and consider that the procedures for asbestos management are adequate for any unexpected finds of asbestos for worker health and safety under the *Work Health and Safety Act 2011* (WHS Act). The AMP is not appropriate for widespread asbestos impact (i.e. not unexpected), nor ensuring the site is ultimately suitable for site use under the CLM Act. A basic remedial action plan (RAP) is recommended to ensure that material disposal/import is appropriate, any fill material remaining on the site is suitable, and documenting the additional sampling requirements recommended by EES in the DSI.

The Auditor agrees with the additional works recommended by EES to close out data gaps, including the assessment of HGG and assessment of the potential former service station.

4. Conclusion and Recommendations

Overall, in the Auditor's opinion, the DSI was adequate to assess contamination likely to be disturbed during shaft and surface construction activities. There is doubt with regards to the identified extent of asbestos contamination, however, it is understood that any unexpected finds of asbestos encountered during development works will be managed through the AMP prepared by CPBG. It is noted that the AMP is not appropriate for widespread asbestos impact or ensuring the site is suitable for commercial/industrial site use.

It is recommended that a basic RAP is prepared outlining the requirements for waste management (handling and offsite disposal), importation of material, the suitability assessment of any fill material which may remain (including potential asbestos impact) and any additional sampling requirements recommended by EES to address data gaps.

* * *

Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd

[redacted]
EPA Accredited Site Auditor 1505

[redacted]
[redacted]@ramboll.com

Attachments: 1 Site Location
2 DSI Soil Sample Locations
3 DSI Monitoring Well Locations

Attachment 1: Site Location

Legend

- Site Boundary
- Road-base Gravel at surface
- Stockpiles
- Former Gipps Stree tLandfill (approximate)
- Excluded Area

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Observed Site Layout

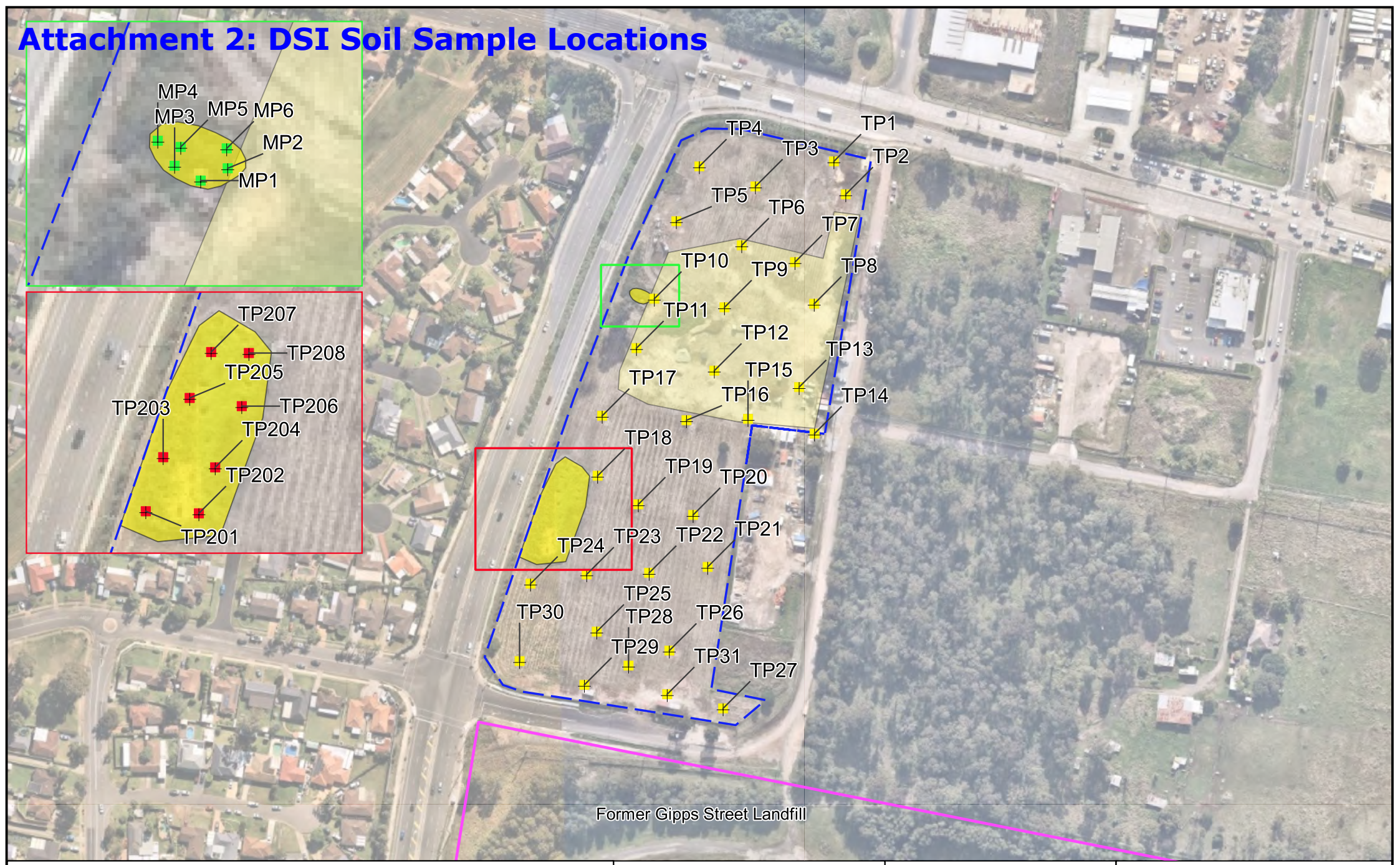
Client: Road and Rail Excavations

Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG	Scale: As Shown	Job No: 122045
Drawn By: SG	Date: July 2022	

Figure 2

Attachment 2: DSI Soil Sample Locations



Legend

Sample Locations
- Site investigation
- Small stockpile
- former Stockpile footprint
- Site Boundary
- Former Gipps Street Landfill (approximate)

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Soil Investigation Locations

Client: Road and Rail Excavations

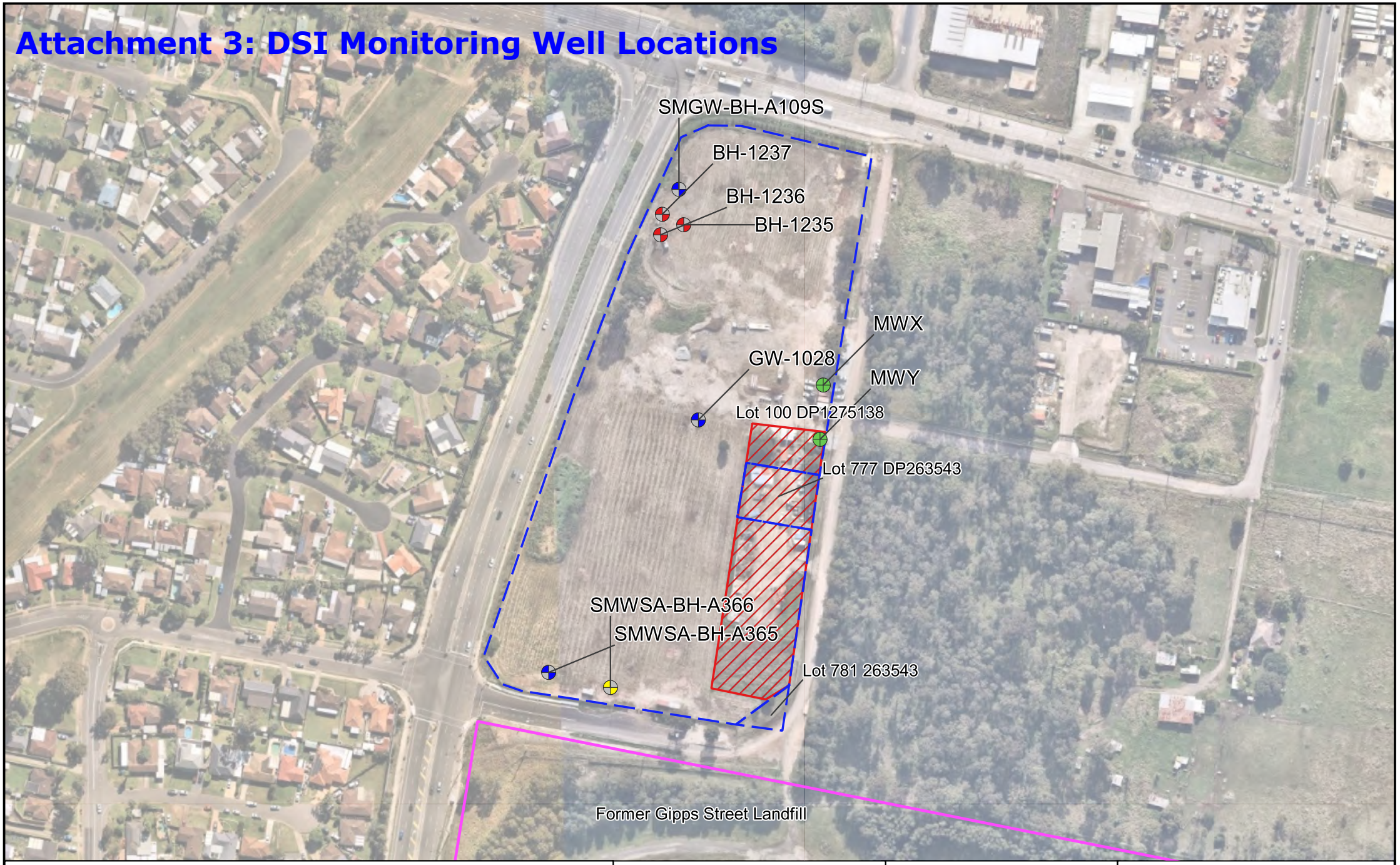
Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG | Scale: As Shown | Job No: 122045

Drawn By: SG | Date: July 2022

Figure 5

Attachment 3: DSI Monitoring Well Locations



Legend

- Site Boundary
- Excluded Area
- Groundwater Bore
- Soil/ Rock Bore
- Gas Bore
- Unknown Bores
- Former Gipps Street Landfill (approximate)

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Groundwater and Hazardous Ground Gas Investigation Locations

Client: Road and Rail Excavations

Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG	Scale: As Shown	Job No: 122045
Drawn By: SG	Date: June 2022	

Figure 6

RAMBOLL

ENVIRONMENT
& HEALTH

28 September 2022

CPB Contractors Pty Ltd and Ghella Pty Ltd
Attn: [redacted]
Level 2, 177 Pacific Highway
North Sydney NSW 2060

By email:[redacted].com.au

Dear Stuart

RE: INTERIM AUDIT ADVICE LETTER NO.8 - REVIEW OF REMEDIATION ACTION PLAN, PROPOSED SYDNEY METRO WESTERN SYDNEY AIRPORT CLAREMONT MEADOWS SERVICES FACILITY, 1-17 GIPPS STREET, CLAREMONT MEADOWS NSW

Ramboll Australia Pty Ltd
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Ref: 318001447-002

Audit Number: TO-095

1. Background and Objective

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, on behalf of CPB Contractors Pty Ltd and Ghella Pty Ltd (CPBG), I am conducting an Audit (TO-095) under the NSW *Contaminated Land Management Act 1997* (CLM Act) in relation to the proposed Claremont Meadows Services Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows NSW (Part Lot 100 DP1275138) which forms part of the Sydney Metro - Western Sydney Airport (SMWSA) rail project.

The site occupies an area of approximately 4 hectares (ha) and is located in the City of Penrith local government area. The current zoning of the site is R3 (Medium Density Residential) and B6 (Enterprise Corridor) under the Penrith Local Environmental Plan 2010. The site layout is shown on Attachment 1.

This IAA (IAA8) has been prepared to document an independent review of the remediation action plan (RAP) prepared for the site. The RAP was prepared to satisfy Clause 12.20(a) of the deed between Transport for NSW and CPBG. This Interim Audit Advice (IAA) letter (IAA8) has been prepared to satisfy this Clause 12.20(c)(ix) of the deed, which requires the RAP to be accompanied by an IAA.

The Audit is required under Conditions E94, E96 and E97 of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces. The audit is therefore statutory. The overall objective of the audit is to enable a Section A1 or A2 site audit statement (SAS) and supporting site audit report (SAR) to be prepared that confirms the site is suitable for the proposed development (Condition E96). Condition E94 requires a Section B SAS and SAR certifying that the RAP is appropriate, and the site can be made suitable for the proposed use prior to remediation commencing. This IAA was not prepared to satisfy Condition E94.

Ramboll Australia Pty Ltd
ACN 095 437 442
ABN 49 095 437 442

The Auditor previously undertook an independent review of a detailed site investigation (DSI) prepared for the site which was documented in IAA1 dated 19 August 2022.

As documented in IAA1, the site has been subject to previous preliminary intrusive investigations of soil and groundwater which did not identify contamination above human health criteria for a commercial/industrial land use. The DSI was undertaken over periods in April, May and July 2022 and included sampling of in-situ soil, stockpiles, groundwater and hazardous ground gas (HGG). The reported concentrations of contaminants in soil were below the laboratory's limit of reporting (LOR) and the adopted criteria considering a commercial/industrial land-use scenario. The sample locations undertaken did not identify widespread or visible asbestos/ACM, however asbestos was detected through laboratory assessment as fibrous asbestos (FA) in two surface samples at concentrations below the adopted NEPM (2013) health screening level (HSL). The DSI identified data gaps and provided recommendations which were required to be considered during remediation and site works.

IAA1 concluded that "*The scope of work undertaken for the DSI was generally adequate to assess contamination likely to be disturbed during shaft and surface construction activities. The scope of work was not suitable to demonstrate the suitability of the site for commercial/industrial land use. The assessment of asbestos was not undertaken in accordance with NEPM (2013) and, given the site history, AF/FA detections and limitations of the site investigation, it is considered reasonably likely that asbestos (ACM and/or AF/FA) is present in fill material*".

Further IAA1 noted that there was doubt with regards to the identified extent of asbestos contamination, however, it was understood that any unexpected finds of asbestos encountered during development works will be managed through the project asbestos management plan (AMP) prepared by CPBG. IAA1 also noted that the AMP was not appropriate for widespread asbestos impact or ensuring the site is suitable for commercial/industrial site use.

IAA1 recommended that a basic RAP be prepared outlining the requirements for waste management (handling and offsite disposal), importation of material, the suitability assessment of any fill material which may remain (including potential asbestos impact) and any additional sampling requirements recommended in the DSI to address data gaps.

2. Scope of Work

The following report was reviewed for this IAA:

- 'Remediation Action Plan, 1-17 Gipps Street, Claremont Meadows NSW', dated 26 September 2022, Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES) (*the RAP*)

I provided review comments on a previous version of the RAP (Version 1 dated 18 August 2022) by email on 12 September 2022 and received responses from EES by email as well as a revised report (Version 3 dated 15 September 2022). Additional review comments were provided on the revised report by email on 20 September 2022 and responses by EES were provided by email along with the updated RAP (Version 4 dated 26 September).

I reviewed the RAP against the requirements of the following:

- NSW EPA (2016) '*Environmental Guidelines, Solid Waste Landfills'*
- NSW EPA (2017) '*Guidelines for the NSW Site Auditor Scheme (3rd Edition)'*
- NSW EPA (2020) '*Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'*
- NSW EPA (2020) '*Contaminated Land Guidelines, Assessment and management of hazardous ground gases'*
- National Environment Protection Council (NEPC) '*National Environment Protection (Assessment of Site Contamination) Measure 1999',* as Amended 2013 (NEPM, 2013)

- Western Australia Department of Health (WA DoH) (2021) '*Guidelines for Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'
- Chapter 4 Remediation of Land in the *Resilience and Hazards State Environment Planning Policy (SEPP) 2021* (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land'*
- HEPA (2020) *'PFAS National Environmental Management Plan, Version 2.0 – January 2020'*

3. Review of RAP

As noted in Section 1, intrusive investigations did not identify an immediate requirement to undertake site remediation works. However, data gaps were identified and potential exists for unexpected finds. Therefore a RAP was prepared to document the additional investigation requirement, an unexpected finds protocol and processes for material handling (i.e. waste disposal, importation of material and validation of retained fill material) to ensure that the site is suitable for the intended use as a construction site. The overarching objective of the RAP was *"…to provide guidance to remediate potential contamination and manage unexpected finds and/or residual risks such that no unacceptable risk based on the proposed commercial/industrial land use scenario is present to identified receptors"*.

The DSI identified several data gaps that require further assessment. Actions to close out the identified data gaps were provided Section 6 of the RAP. Potential remediation options were presented and evaluated for project suitability. The RAP noted that as site impacts identified to date are related to the physical presence of asbestos/ACM in fill/soils only, the remediation options/ technologies that are suitable for managing this impact were considered when evaluating remediation options. Two preferred options were selected which included: treatment via 'emu-picking' for visible asbestos and reuse of material under a barrier (e.g. road seal), and; excavation of contaminated material with offsite disposal to landfill. Whilst contamination has not been identified, the RAP identifies the most relevant options for the contamination most likely to be identified on site.

3.1. Deed Compliance Summary

Table 3.1 below has been prepared to document compliance with Condition 12.20 (a) of the deed agreed between Transport for NSW and CPBG. It is noted that a copy of the Deed has not been provided and the Auditor has only been provided with a snippet.

Table 3.1: Clause 12.20 Remediation Action Plan Deed Compliance

Deed Clause	Deed Item	Comments
12.20(a)	The SBT Contractor must prepare and submit to the Principal's Representative and Independent Certifier a RAP in respect of the DSI performed in accordance with clause 12.19 prior to commencing any excavation activities (except in relation to Preliminary Works)	Outside Auditor scope however it is noted that both a DSI and RAP have been prepared.
12.20(b)	Except in relation to the RAP in respect of Orchard Hills East Station, the SBT Contractor may not submit a RAP unless and until the DSI report for the relevant area has been submitted to the Principal's Representative and has not been the subject of 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	Outside Auditor scope however it is noted that both a DSI and RAP have been prepared.
12.20(c)(i)	Each RAP must describe the nature and extent of contamination based on the DSI, the Information Documents and any other relevant information which is necessary to characterise risk to the	Section 4 of the RAP includes a summary of previous site investigations, including the DSI.

Deed Clause	Deed Item	Comments
	construction, operation and maintenance of Sydney Metro – Western Sydney Airport	
12.20(c)(ii)	Each RAP must describe the manner in which the SBT Contractor will remediate contamination within the proposed areas of excavation and/or disturbance	Section 9 of the RAP outlines actions required when undertaking remediation
12.20(c)(iii)	Each RAP must 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 areas 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 areas of excavation or disturbance	Section 5 (Table 3) of the RAP outlines a conceptual site model and risk linkages for the identified contamination sources and contaminants of concern.
12.20(c)(iv)	Each RAP must 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) D. Compliance with this deed	Section 8 of the RAP provides a remediation options evaluation including selection criteria and the selected preferred option.
12.20(c)(v)	Each RAP must define what will constitute Remediation Practical Completion of the Remediation	Not explicitly stated however Section 13.3 of the RAP notes that a validation report is to be completed following completion of site bulk earthworks including excavation and off-site disposal and importation of fill materials. This includes any details of additional assessments undertaken in response to unexpected finds
12.20(c)(vi)	Each RAP must 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 environmental risk assessment and any other requirement of this deed	Section 3 of the RAP outlines applicable legislation, guidelines, codes of practice and standards which were applicable to the RAP. A list of references is also provided in Section 16.
12.20(c)(vii)	Each RAP must be reviewed and approved by a certified contaminated land consultant	The version history page of each RAP indicates that the internal reviewer is a certified contaminated land consultant
12.20(c)(viii)	Each RAP must be reviewed and endorsed by an Accredited Site Auditor	RAP has been reviewed and endorsed as documented in this IAA
12.20(c)(ix)	Each RAP must be accompanied by an interim site audit advice prepared by the accredited Site Auditor when submitted to the Principal's Representative and the Independent Certifier in accordance with clause 12.20(a)	RAP has been reviewed and endorsed as documented in this IAA. Submission is outside Auditor scope of works

Auditor's Opinion: The investigations undertaken have not identified the need for remediation, however, some data gaps exist that are proposed to be addressed through the RAP. The remediation approach recommended in the RAP is considered adequate and appropriate to manage contamination that is likely to be identified, subject to successful implementation of the RAP and preparation of a validation report.

4. Conclusion and Recommendations

Overall, in the Auditor's opinion, the investigations undertaken have not identified the need for remediation of soil, groundwater, HGG or vapour contamination, however, some data gaps exist that are proposed to be addressed through the RAP. The remediation approach recommended in the RAP is considered adequate to manage contamination that is likely to be identified and the process for material handling (i.e. waste disposal, importation of material and validation of retained fill material) is appropriately documented. Should contamination be identified, the RAP, if adequately implemented, should ensure the site is suitable for the proposed construction activities, however, successful validation will be required to confirm this.

5. Limitations

This interim audit advice (IAA8) was conducted on behalf of CPBG for the purpose of assessing the suitability and appropriateness of a remedial action plan (RAP). This summary report may not be suitable for other uses.

The Auditor has relied on the documents referenced in Section 2 in preparing the Auditor's opinion. The consultants included limitations in their reports. This interim audit advice must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check. If the Auditor is unable to rely on any of those documents, the conclusions of this interim audit advice could change.

It is not possible to present all data which could be of interest to all readers of this interim audit advice. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

* * *

Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd

[redacted]
EPA Accredited Site Auditor 1505

[redacted]

Attachments: 1 Site Location

Attachment 1: Site Location

Legend

- Site Boundary
- Road-base Gravel at surface
- Stockpiles
- Former Gipps Stree tLandfill (approximate)
- Excluded Area

0 25 50 75 m

N

Details approximate only.
Datum: GDA 2020

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Observed Site Layout

Client: Road and Rail Excavations

Location: 1-17 and 19 Claremont Meadows, NSW 2747

Project Manager: SG	Scale: As Shown	Job No: 122045
Drawn By: SG	Date: July 2022	

Figure 2

RAMBOLL

ENVIRONMENT
& HEALTH

17 April 2023

CPB Contractors Pty Ltd and Ghella Pty Ltd
Attn: [redacted]
Level 2, 177 Pacific Highway
North Sydney NSW 2060

By email: [redacted]

Dear [redacted]

RE: INTERIM AUDIT ADVICE LETTER NO.15 - REVIEW OF DATA GAP ASSESSMENT & HAZARDOUS GROUND GAS RISK ASSESSMENT, PROPOSED SYDNEY METRO WESTERN SYDNEY AIRPORT CLAREMONT MEADOWS SERVICES FACILITY, 1-17 GIPPS STREET, CLAREMONT MEADOWS NSW

Ramboll Australia Pty Ltd
Level 3, 100 Pacific Highway
PO Box 560
North Sydney NSW 2060

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Ref: 318001447-002

Audit Number: TO-095

1. Introduction and Objective

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, on behalf of CPB Contractors Pty Ltd and Ghella Pty Ltd (CPBG), I am conducting an Audit (TO-095) under the NSW *Contaminated Land Management Act 1997* (CLM Act) in relation to the proposed Claremont Meadows Services Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows NSW (Part Lot 100 DP1275138) which forms part of the Sydney Metro - Western Sydney Airport (SMWSA) rail project. The site occupies an area of approximately 4 hectares (ha) and is located in the City of Penrith local government area. The current zoning of the site is R3 (Medium Density Residential) and B6 (Enterprise Corridor) under the Penrith Local Environmental Plan 2010. The site location and layout are shown on Attachment 1.

The audit is required under Conditions E94, E96 and E97 of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces. The audit is therefore statutory. The overall objective of the audit is to enable a Section A1 or A2 site audit statement (SAS) and supporting site audit report (SAR) to be prepared that confirms the site is suitable for the proposed development.

The objective of this Interim Audit Advice (IAA) letter (IAA15) is to provide an independent review of a data gap assessment (DGA) and hazardous ground gas risk assessment (HGGRA) completed to target the potential risks associated with possible historic use of part of the site as a service station and potential migration of hazardous ground gas (HGG) from the offsite former Gipps Street landfill, as identified in the detailed site investigation (DSI) and remediation action plan (RAP). IAA15 has been prepared to satisfy Conditions of the deed agreed between Transport for NSW and CPBG. The DGA relates to a portion of the Claremont Meadows site comprising approximately 300 m^2, where possible service station uses were identified. The location and extent of this area is shown on Attachment 1 and 2.

Ramboll Australia Pty Ltd
ACN 095 437 442
ABN 49 095 437 442

2. Background

The Auditor previously undertook independent reviews of a DSI and RAP that were documented in IAA1 (dated 19 August 2022) and IAA8 (dated 28 September 2022), respectively.

As documented in IAA1, the site was subject to previous preliminary intrusive investigations of soil and groundwater which did not identify contamination above human health criteria for a commercial/industrial land use. The DSI sample locations did not identify widespread or visible asbestos, however asbestos was detected through laboratory assessment as fibrous asbestos (FA) in two surface samples at concentrations below the adopted NEPM (2013) health screening level (HSL). The DSI identified data gaps and provided recommendations to be considered during remediation and site works.

IAA1 concluded that "*The scope of work undertaken for the DSI was generally adequate to assess contamination likely to be disturbed during shaft and surface construction activities. The scope of work was not suitable to demonstrate the suitability of the site for commercial/industrial land use. The assessment of asbestos was not undertaken in accordance with NEPM (2013) and, given the site history, AF/FA detections and limitations of the site investigation, it is considered reasonably likely that asbestos (ACM and/or AF/FA) is present in fill material*".

IAA1 recommended that a basic RAP be prepared outlining the requirements for waste management (handling and offsite disposal), importation of material, the suitability assessment of any fill material which may remain (including potential asbestos impact) and any additional sampling requirements recommended in the DSI to address data gaps.

IAA8 reviewed the basic RAP prepared for the site and concluded "*Overall, in the Auditor's opinion, the investigations undertaken have not identified the need for remediation of soil, groundwater, HGG or vapour contamination, however, some data gaps exist that are proposed to be addressed through the RAP. The remediation approach recommended in the RAP is considered adequate to manage contamination that is likely to be identified and the process for material handling (i.e. waste disposal, importation of material and validation of retained fill material) is appropriately documented. Should contamination be identified, the RAP, if adequately implemented, should ensure the site is suitable for the proposed construction activities, however, successful validation will be required to confirm this.*".

3. Scope of Work

The following reports were reviewed for this IAA:

- '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', dated 13 April 2023, Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES) (*the DGA*)
- 'Hazardous Ground Gas Risk Assessment - Claremont Meadows Services Facility', Version 1 dated 6 April 2023, EES (*the HGGRA*)

I provided review comments on a previous version of the DGA (dated 30 September 2022) on 1 February 2023 and received a revised report (dated 13 April 2023) from EES on 14 April 2023. Review comments on the previous version of the HGGRA (Version 0, dated 23 February 2023) were provided on 14 March 2023 and responses and an updated report from EES were provided on 6 April 2023.

I reviewed the DGA and HGGRA against the requirements of the following:

- Chapter 4 Remediation of Land in the *Resilience and Hazards State Environment Planning Policy (SEPP) 2021* (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land'*

- NSW EPA (2016) '*Environmental Guidelines, Solid Waste Landfills'*
- National Environment Protection Council (NEPC) '*National Environment Protection (Assessment of Site Contamination) Measure 1999',* as Amended 2013 (NEPM, 2013)
- NSW EPA (2017) '*Guidelines for the NSW Site Auditor Scheme (3rd Edition)'*
- NSW EPA (2020a) '*Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'*
- NSW EPA (2020b) '*Contaminated Land Guidelines, Assessment and management of hazardous ground gases'*
- NSW EPA (2022) '*Sampling design part 1 – application'* and '*Sampling design part 2 – interpretation'*
- Western Australia Department of Health (WA DoH) (2021) '*Guidelines for Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'

4. Review of DGA

The objective of the DGA was to *"…complete a data gap investigation to address potential risks associated with possible historic use of part of the site as a service station which may have resulted in hydrocarbon impact from bulk storage and distribution of hydrocarbon fuels"*.

The DGA included soil sampling from six boreholes (BH1 to BH6). Two boreholes (BH1 and BH2) were drilled to depths of approximately 1 metre below the base of a sediment basin (which was excavated previously to 3-3.5 m below site levels) and four boreholes (BH3 to BH6) to depth of 3 metres below ground level (mbgl). The DGA sample locations are shown in Attachment 2.

Soil samples were generally collected at pre-determined intervals within the soil profile (0-0.1 mbgl, 0.5 and 1 mbgl then every 1 mbgl) or where changes in the soil profile were noted. Soils samples were screened in the field for the presence of ionisable volatile organic compounds (VOCs) using a calibrated photo-ionisation detector (PID).

Fill and natural samples obtained were submitted for laboratory analysis for various combinations of 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 performed on select samples.

Key findings from the soil investigation, as reported in the DGA, are as follows:

- Ground conditions in the two boreholes (BH1 and BH2) drilled at the base of the sediment basin identified natural light brown and orange clay with inclusions of ironstone gravels to the termination depth. Ground conditions in the four boreholes (BH3 to BH6) drilled to the south of the sediment basin identified fill/reworked natural clay with concrete and gravels to depths of approximately 1.0 mbgl underlain by natural brown and red clay with ironstone gravels to the termination depths of 3 mbgl. No other anthropogenic material, ACM or visual/olfactory indicators of contamination (such as staining and odours) were noted.
- Soil headspace PID readings were below 1 parts per million (ppm), indicating a low likelihood for significant VOC contamination in the sampled soils.
- The reported contaminant concentrations were generally below the laboratory detection limits and/or the adopted human health and ecological criteria for a commercial/industrial land use setting provided in NEPM (2013). Asbestos in the form of AF was identified in one sample (BH6_0.2) at a concentration of 0.00005% weight for weight (% w/w), however was below the adopted human health screening level for all land uses (0.001% w/w).

Based on the results of the DGA, EES concluded:

> *"Based upon results and findings from this assessment, Environmental Earth Sciences concludes 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 considered not necessary."*.

Auditor's Opinion: The scope of work undertaken for the DGA was adequate to identify contamination associated with the possible former service station, which was not identified. The Auditor agrees with the EES conclusions that no additional assessment and/or remediation is warranted for this area.

5. Review of HGGRA

The objective of the HGGRA was to *"…evaluate the potential level of risk 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, Environmental Earth Sciences NSW, 2022)"*.

The HGGRA included installation of four soil gas boreholes (GBH1 to GBH4) to maximum depths of approximately 4.15 mbgl along the southern boundary of the site, closest to the offsite former Gipps Street landfill (Attachment 3). The soil gas bores were constructed using 50 mm uPVC screen and casing with a screen length of 2 m. The screen was slotted with 1 mm wide slits to allow ground gas to enter the bore with 2 mm graded sand used to create a filter to 0.5 m above the top of the screen section. Above the sand a bentonite plug of approximately 1.3 m thickness was installed to mitigate potential cross contamination and/or ambient effects from the surface. The bore annulus was then concreted to the surface and finished with a high-visibility steel monument with a stick-up height of approximately 1 m.

HGG monitoring was undertaken in one location (GBH1) using a Ambisense GasFlux continuous monitoring system which recorded concentrations of gases (methane, carbon dioxide, oxygen, carbon monoxide, hydrogen sulfide), barometric pressure and borehole flow at approximately 1-hour intervals for a total duration of 30 days (16 January 2023 to 16 February 2023). A summary of the Ambisense results is provided in Figure 5.1 below. EES noted that from approximately 1:13 am 18 January 2023 to approximately 12:15 am 20 January 2023 no readings were collected by the unit due to a technical issue (server issue), however EES noted that there was no impact on the subsequent data collected and no calibration was required. Graphic representation of the dataset across the monitoring period has been included as Attachment 4.

In addition, two existing groundwater wells (SM-WSA-BH-A365 and GW-1028) were sampled for dissolved gases C_1–C_4 (methane, ethene, ethane, propene, propane, butene, butane). The results were less than the laboratory detection limit.

Figure 5.1: Summary of the Ambisense Data (Source: the HGGRA)

Analyte/ Statistic		GBH1
		n = 655
Methane (% v/v)	Min	0
	Max	0.06
	Average	0.0025
Carbon Dioxide (% v/v)	Min	0.11
	Max	20.9
	Average	12.06
Oxygen (% v/v)	Min	9.91
	Max	22.21
	Average	16.16
Carbon Monoxide (ppm)	Min	0
	Max	489.1
	Average	74.39
Hydrogen Sulfide (ppm)	Min	0
	Max	1.91
	Average	0.13
Borehole flow (l/h)	Min	-0.51
	Max	0.35
	Average	-0.04
Barometric pressure (mbar)	Min	987.91
	Max	1018.6
	Average	1007.02

Notes:
1. % v/v is '% volume / volume'
2. ppm is 'parts per million'
3. mbar is 'millibar'
4. n is 'number of readings'

Key findings from the investigation, as reported in the HGGRA, are as follows:

- Barometric pressure conditions during the monitoring period included continuous decreases in atmospheric pressure across a three-hour period, including one instance of a 'worst-case' scenario on 2 February 2023. EES believed that the data obtained was representative of both normal climactic conditions and indicative of 'worst-case' conditions.
- Based on the results illustrated in Attachment 4, methane is at very low concentrations under all conditions recorded. Ground gas risk at the site is driven by concentrations of carbon dioxide

within the subsurface. There appears to be a correlation between carbon dioxide concentrations and barometric pressure readings. Decreases in atmospheric pressure result in an increase in carbon dioxide concentrations.

- EES calculated gas screening values (GSV) in accordance with the methodology outlined in NSW EPA (2020b) for the results obtained at GBH1 utilising the peak flow, methane, and carbon dioxide concentrations from the Ambisense GasFlux data and determined a site wide characteristic situation (CS). A maximum GSV of 0.073 L/hr was calculated using the maximum peak flow of 0.35 L/hr and the maximum carbon dioxide concentration reported. This correlates with a CS value of 2 and a 'low' risk rating.

NSW EPA (2020b) requires gas protection measures to be considered where a CS2 or greater is identified, however EES noted that the protection measures are *"…for constructed building, not buildings being constructed. I.e., the gas protection measures are installed during development to provide protection in the future, the measures do not provide protection during construction. With this in mind risk to workers within the shaft and tunnel, as well as other potential excavations at the site, is still considered to be minimal. Works within the shaft and tunnel would require a well ventilated environment hence any residual risk would be appropriately mitigated through mechanical ventilation of below ground spaces. That said, there are (or will be) temporary site sheds and amenities at the site that'll be elevated and off the ground, typically on brick piers or similar, which would provide sub-floor ventilation. In view of this, further gas protection during the construction phase of the development is not appropriate.".*

Based on the results of the HGGRA, EES concluded:

> *"Based on the results of the hazardous ground gas assessment, it is 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."*.

In view of the results and conclusion of the HGGRA and the understanding of potential for changes in response to sustained dewatering, EES recommended that regular HGG monitoring be undertaken at the four gas bores (GBH1 to GBH4). The start of this monitoring was recommended to coincide with the commencement of dewatering on the site and continue through to one month past the conclusion of dewatering (at minimum). 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 to fortnightly or weekly (depending on the severity of the increased risk) as appropriate in order to capture sufficient data to confirm the change in characteristic situation. 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.

Auditor's Opinion: The scope of work undertaken for the HGGRA was adequate to characterise ground gas concentrations on the southern boundary of the site, closest to the offsite former Gipps Street landfill. Only one of the four installed bores was sampled, however the selected bore was closest to the majority of the waste within the former landfill and the continuous monitoring was suitable to assess

potential risk. The risk classification based on the GSV is 'low risk', however is close to 'very low risk', under which no gas protections measures would be required.

The proposed additional monitoring is appropriate to assess for changes in the gas situation resulting from construction works (dewatering onsite and re-surfacing of the landfill offsite). An increase in concentrations, flow, GSV and CS will require gas protection to be considered.

6. Conclusion and Recommendations

Overall, in the Auditor's opinion, the DGA was adequate to assess if the potential former use as a service station had resulted in contamination of the site. No significant contamination was identified that requires remediation.

The Auditor notes that the hazardous ground gas data gap identified in the DSI and RAP has been adequately addressed in the HGGRA based on current site conditions. The results identified a very low to low risk from ground gas (based on current conditions). EES recommend additional monitoring is undertaken to assess for changes in the gas situation resulting from construction works, which is considered appropriate.

7. Limitations

This interim audit advice (IAA15) was conducted on behalf of CPBG for the purpose of assessing the suitability and appropriateness of a DGA and HGGRA to provide an assessment of contamination at the site for construction purposes. This summary report may not be suitable for other uses.

The Auditor has relied on the documents referenced in Section 3 in preparing the Auditor's opinion. The consultant included limitations in their reports. This interim audit advice must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check. If the Auditor is unable to rely on any of those documents, the conclusions of this interim audit advice could change.

It is not possible to present all data which could be of interest to all readers of this interim audit advice. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

* * *

Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd

[redacted]
EPA Accredited Site Auditor 1505

[redacted]@ramboll.com

Attachments: 1 Site Location

2 DGA Sample Locations

3 HGGRA Sample Locations

4 Ambisense GasFlux Gas Readings and Pressure

Attachment 1: Site Location

Legend

- Area of concern (AOC) - Approximate footprint of potential historical service station
- Site boundary

0 5 10 15 m

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Site locality

Client: Road and Rail Excavations

Location: Claremont Meadows Services Facility - 1-17 Gipps St, Claremont Meadows NSW

Project Manager: Sam Goldsmith	Scale: As Shown	Job No: 122045
Drawn By: Karin Azzam	Date: September 2021	

Figure 1

Attachment 2: DGA Sample Locations

Legend

- Borehole locations - Data gap investigation
- Test pit locations (EES, Mar 2022)
- Approximate footprint of potential historical service station
- Trench
- Location of proposed water treatment plant
- Site boundary

0 5 10 15 m

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Sampling locations

Client: Road and Rail Excavations

Location: Claremont Meadows Services Facility - 1-17 Gipps St, Claremont Meadows NSW

Project Manager: Sam Goldsmith | Scale: As Shown | Job No: 122045

Drawn By: Karin Azzam | Date: September 2021

Figure 2

Attachment 3: HGGRA Sample Locations

References:
Lot boundaries - downloaded from SixMaps 13/02/2023
Imagery - NearMap 10 January 2023

N
0 40
Metres
1:2,000 at A4
GDA2020 MGA Zone 56

EESI Environmental Earth Sciences International

Title:	Site Layout
Client:	Road and Rail Excavations
Location:	1-17 and 19 Gipps Street, Claremont Meadows, NSW 2747
Project Manager:	Sam Goldsmith
Scale:	As noted
Job No:	122045
Drawn By:	The Map Lass Pty Ltd
Date:	15 February 2023

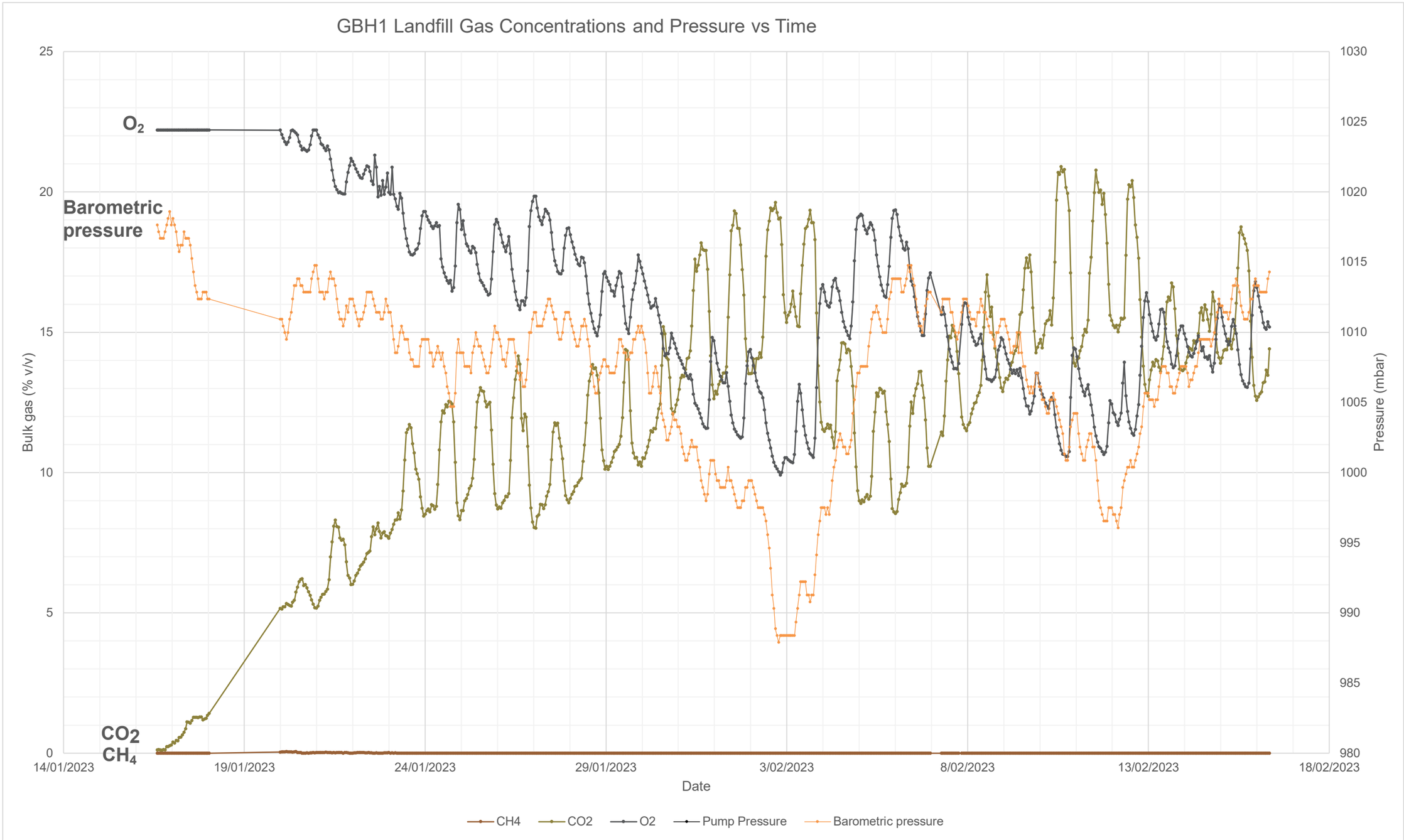
Figure 2

Document Location D:\Projects\EES\EESI 2023-002 122045 Claremont Meadows\Output\122045-001-B (Site Layout).mxd

Attachment 4: Ambisense GasFlux Gas Readings and Pressure

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Figure 3: GBH1 Bulk Gas vs Pressure Measurements



RAMBOLL

ENVIRONMENT
& HEALTH

10 October 2023

CPB Contractors Pty Ltd and Ghella Pty Ltd
Attn: [redacted]
Level 2, 177 Pacific Highway
North Sydney NSW 2060

By email: [redacted]

Dear [redacted]

RE: INTERIM AUDIT ADVICE LETTER NO.18 - REVIEW OF CESSATION OF LANDFILL GAS MONITORING LETTER, PROPOSED SYDNEY METRO WESTERN SYDNEY AIRPORT CLAREMONT MEADOWS SERVICES FACILITY, 1-17 GIPPS STREET, CLAREMONT MEADOWS NSW

Ramboll Australia Pty Ltd
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Ref: 318001447-002

Audit Number: TO-095

1. INTRODUCTION AND OBJECTIVE

As a NSW Environment Protection Authority (EPA) accredited Contaminated Sites Auditor, on behalf of CPB Contractors Pty Ltd and Ghella Pty Ltd (CPBG), I am conducting an Audit (TO-095) under the NSW *Contaminated Land Management Act 1997* (CLM Act) in relation to the proposed Claremont Meadows Services Facility (CMSF) located at 1-17 Gipps Street, Claremont Meadows NSW (Part Lot 100 DP1275138) which forms part of the Sydney Metro - Western Sydney Airport (SMWSA) rail project. The site occupies an area of approximately 4 hectares (ha) and is located in the City of Penrith local government area. The current zoning of the site is R3 (Medium Density Residential) and E3 (Productivity Support) under the Penrith Local Environmental Plan 2010. The site location and layout are shown on Attachment 1.

The audit is required under Conditions E94, E96 and E97 of Critical State Significant Infrastructure (CSSI) approval 10051, issued on 23 July 2021 by the Minister for Planning and Public Spaces. The audit is therefore statutory. The overall objective of the audit is to enable a Section A1 or A2 site audit statement (SAS) and supporting site audit report (SAR) to be prepared that confirms the site is suitable for the proposed development.

The objective of this Interim Audit Advice (IAA) letter (IAA18) is to provide an independent review of a letter prepared to support the cessation of ongoing landfill gas monitoring at the site.

Ramboll Australia Pty Ltd
ACN 095 437 442
ABN 49 095 437 442

2. BACKGROUND

The Auditor has previously undertaken independent reviews of a detailed site investigation (DSI), remediation action plan (RAP), data gap assessment (DGA) and hazardous ground gas risk assessment (HGGRA) which were prepared for the site. Outcomes of the reviews were documented by the Auditor in separate IAAs including:

- 'Interim Audit Advice Letter No.1 – Review of Detailed Site Investigation, Proposed Sydney Metro Western Sydney Airport Claremont Meadows Services Facility, 1-17 Gipps Street, Claremont Meadows NSW', 19 August 2022, Ramboll Australia Pty Ltd (Ramboll) (*the IAA1*).
- 'Interim Audit Advice Letter No.8 – Review of Remediation Action Plan, Sydney Metro Western Sydney Airport Claremont Meadows Services Facility, 1-17 Gipps Street, Claremont Meadows NSW', 28 September 2022, Ramboll (*the IAA8*).
- 'Interim Audit Advice Letter No.15 – Review of Data Gap Assessment & Hazardous Ground Gas Risk Assessment, Sydney Metro Western Sydney Airport Claremont Meadows Services Facility, 1-17 Gipps Street, Claremont Meadows NSW', 17 April 2023, Ramboll (*the IAA15*).

Relevant information from these reports and IAAs is referenced herein, where required.

As documented in IAA1, the site was subject to previous preliminary intrusive investigations of soil and groundwater which did not identify contamination above human health criteria for a commercial/industrial land use. The DSI sample locations did not identify widespread or visible asbestos, however asbestos was detected through laboratory assessment as fibrous asbestos (FA) in two surface samples at concentrations below the adopted NEPM (2013) health screening level (HSL). The DSI identified data gaps and provided recommendations to be considered during remediation and site works.

IAA1 recommended that a basic RAP be prepared outlining the requirements for waste management (handling and offsite disposal), importation of material, the suitability assessment of any fill material which may remain (including potential asbestos impact) and any additional sampling requirements recommended in the DSI to address data gaps. Data gaps identified included potential risks associated with possible historic use of part of the site as a service station and potential migration of hazardous ground gas (HGG) from the offsite former Gipps Street landfill (located south of the site).

A RAP, data gap assessment (DGA) and hazardous ground gas risk assessment (HGGRA) were completed for the site. Findings did not identify any additional contamination requiring remediation, however, the HGGRA recommended additional monitoring of HGG be undertaken to assess for changes in the gas situation resulting from construction works.

Subsequently, Glaeba (02) Pty Ltd trading as Environmental Earth Sciences NSW (EES) have completed four monthly gas monitoring events at the site from June to September 2023. In addition, CPBG have obtained two reports from Penrith City Council prepared by Douglas Partners Pty Ltd (Douglas) relating to HGG assessments at the neighbouring former Gipps Street landfill.

Based on the results of the four EES monthly gas monitoring events and the recently obtained Douglas reports for the Gipps Street landfill, it is understood that CPBG have requested a re-evaluation of the ongoing monthly gas monitoring recommended by the HGGRA. As a result, EES have prepared an advice letter regarding the cessation of landfill gas monitoring at the site.

3. SCOPE OF WORK

The following reports were reviewed for this IAA:

- 'Advice letter regarding cessation of landfill gas monitoring at the Claremont Meadows Services Facility (CMSF) in Claremont Meadows, NSW', dated 25 September 2023, EES (*the Cessation Letter*)

The Cessation Letter was based on a review of the following reports:

- 'Ground Gas Monitoring and Assessment, Proposed Recreational Development, Gipps Street, Claremont Meadows, NSW', 25 March 2021, Douglas.
- 'Additional Ground Gas Investigation Works, Proposed Recreational Development, Gipps Street, Claremont Meadows', 8 July 2022, Douglas.
- 'Factual Gas Monitoring Report No.1 (June 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', 16 June 2023, EES.
- 'Factual Gas Monitoring Report No.2 (July 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', 14 July 2023, EES.
- 'Factual Gas Monitoring Report No.3 (August 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', 10 August 2023, EES.
- 'Factual Gas Monitoring Report No.4 (September 2023): Proposed Claremont Meadows Services Facility, Claremont Meadows NSW', 14 September 2023, EES.

I have reviewed the Cessation Letter against the requirements of the following:

- Chapter 4 Remediation of Land in the *Resilience and Hazards State Environment Planning Policy (SEPP) 2021* (formerly known as SEPP 55) and NSW Department of Urban Affairs and Planning and NSW EPA (1998) *'Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land'*
- National Environment Protection Council (NEPC) *'National Environment Protection (Assessment of Site Contamination) Measure 1999',* as Amended 2013 (NEPM, 2013)
- NSW EPA (2016) *'Environmental Guidelines, Solid Waste Landfills'*
- NSW EPA (2017) *'Guidelines for the NSW Site Auditor Scheme (3rd Edition)'*
- NSW EPA (2020a) *'Contaminated Land Guidelines, Consultants Reporting on Contaminated Land'*
- NSW EPA (2020b) *'Contaminated Land Guidelines, Assessment and management of hazardous ground gases'*

4. REVIEW OF CESSATION LETTER

The objective of the Cessation Letter was to *"…evaluate the need for further subsurface gas monitoring at the site"*.

The Cessation Letter included a review of current and historical ground gas data (Douglas and EES) from on-site and off-site locations to evaluate prevailing ground gas conditions, include Gas Screening Values (GSV) and Characteristic Scenarios (CS) in accordance with NSW EPA (2020b).

EES reported that the Douglas reports indicate that the northern extent of the former landfill is approximately 70 m south of the site at its nearest, the waste mass is up to 14 m thick and the landfill does not appear to have been lined, with the waste deposited into residual soil comprising clay, sandy

clay and clayey sand. The landfill does include a cap that is between 0.5 m and 3.4 m thick. A leachate trench was installed around 2007 between the former landfill and the site that extends along the northern, eastern and southern extent of the landfill. The leachate trench is keyed into underlying bedrock and is expected to be at least 14-15 m deep.

There are three landfill gas bores along the northern boundary of the former landfill: GAS 5 and GAS 6 located outside the footprint of the former landfill; and BH103 located within the footprint of the former landfill (Attachment 2). As documented in IAA15, the HGGRA also included installation of four soil gas boreholes (GBH1 to GBH4) to maximum depths of approximately 4.15 mbgl along the southern boundary of the site, closest to the offsite former Gipps Street landfill (Attachment 1).

The Cessation Letter included a consolidated data set from six locations (GAS 5, GAS 6 and GBH1 to GBH4) obtained from Douglas and EES spanning from 30 March 2017 to 6 September 2023. This data was considered by EES to be representative of ground gas conditions to the north of the former landfill and would therefore be relevant to assessment of HGG risk to the site. Review of the data indicates that the methane and carbon dioxide concentrations were fairly consistent over time and between wells, with some minor variability. Methane concentrations appeared relatively low while carbon dioxide concentrations were elevated in the monitored boundary wells (and were typically greater than carbon dioxide concentrations found in BH103 located within the landfill).

The maximum (peak) methane concentration across the data set was 2.8% v/v (at GAS 6 on 18 June 2020) while the maximum flow (initial) was 9.7 L/h (at GAS 6 on 3 June 2020) indicating a methane GSV of 0.3 and CS 2 ('low risk'). Generally, the recorded methane GSVs for each location were very low (0.000 to 0.03) and CS 1 (indicative of a 'very low risk'). The maximum (peak) carbon dioxide concentration across the data set was 29.5% v/v (at GBH1 on 8 June 2023) while the maximum flow is 9.7 L/h (at GAS 6 on 3 June 2020), with a maximum carbon dioxide GSV of 0.4 and CS 2 (indicative of 'low risk') at GAS 6 on 3 June 2020.

EES reported that the methane concentrations at locations GAS 6 and BH103, which are on either side of the leachate trench (one within and one outside the footprint of the former landfill), indicate the leachate trench is effective at reducing off-site migration of landfill gas.

EES noted that the Douglas reports hypothesised that elevated carbon dioxide outside the landfill is naturally occurring and/or due to background conditions. The carbon dioxide concentrations at location GAS 6 (outside the landfill footprint) are relatively higher than the concentrations at location BH103. Based on these results, EES reported that this supports the Douglas hypothesis that carbon dioxide concentrations are naturally occurring.

Based on the findings of the Cessation Letter, the following conclusions are drawn by EES:

- "*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.*

In view of the results of this landfill gas assessment completed herein, it is considered that ongoing monitoring of ground gas conditions is not appropriate at this stage."

5. CONCLUSION

Overall, in the Auditor's opinion, the dataset reviewed for the Cessation Letter appears adequate to assess potential migration of HGG from the offsite former Gipps Street landfill to the site. The results identified a risk classification based on the GSV as very low to low risk from ground gas (based on current conditions). Based on the information presented in the Cessation Letter, the Auditor agrees with EES that ongoing monitoring of ground gas is not required.

6. LIMITATIONS

This interim audit advice (IAA18) was conducted on behalf of CPBG for the purpose of assessing whether the ongoing monitoring of HGG at the site during construction could cease. This summary report may not be suitable for other uses.

The Auditor has relied on the documents referenced in Section 3 in preparing the Auditor's opinion. The consultant included limitations in their reports. This interim audit advice must also be subject to those limitations. The Auditor has prepared this document in good faith but is unable to provide certification outside of areas over which the Auditor had some control or is reasonably able to check. If the Auditor is unable to rely on any of those documents, the conclusions of this interim audit advice could change.

It is not possible to present all data which could be of interest to all readers of this interim audit advice. Readers are referred to the referenced reports for further data. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

* * *

Consistent with the NSW EPA requirement for staged 'signoff' of sites that are the subject of progressive assessment, remediation and validation, I advise that:

- This advice letter does not constitute a Site Audit Report or Site Audit Statement.
- At the completion of the remediation and validation I will provide a Site Audit Statement and supporting documentation.
- This interim advice will be documented in the Site Audit Report.

Yours faithfully
Ramboll Australia Pty Ltd

[redacted]
EPA Accredited Site Auditor 1505

[redacted]@ramboll.com

Attachments: 1 Site Location and HGG Sample Locations

2 Former Gipps Street Landfill and HGG Sample Locations

Attachment 1: Site Location and HGG Sample Locations

ENVIRONMENTAL EARTH SCIENCES
CONTAMINATION RESOLVED

Title: Site locality

Client: Road and Rail Excavations

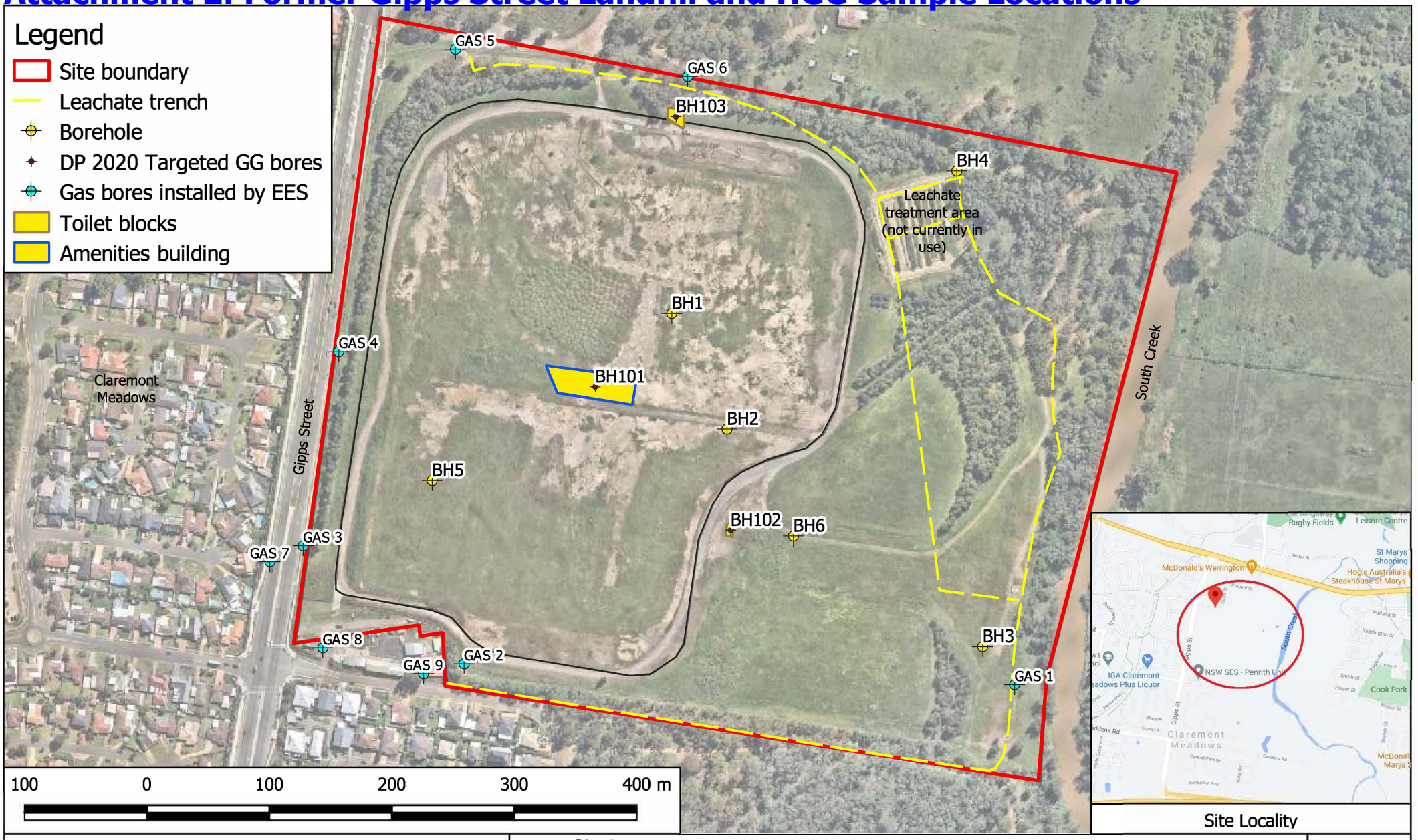
Location: Claremont Meadows Services Facility - 1-17 Gipps St, Claremont Meadows NSW

Project Manager: Jessica Whitehead | Scale: As Shown | Job No: 123029

Drawn By: Jessica Whitehead | Date: September 2023

Figure 1

Attachment 2: Former Gipps Street Landfill and HGG Sample Locations



Douglas Partners
Geotechnics / Environment / Groundwater

TITLE: **Site Layout**
Ground Gas Risk Assessment
Gipps Street Reserve, Claremont Meadows

MGA

CLIENT: Penrith City Council	PROJECT No.: 92291.03	SCALE: As shown	DRAWING No: 1
OFFICE: Macarthur	DRAWN BY:	DATE: 5 November 2020	REVISION: 0

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