

# Aerotropolis Validation Report

## Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works

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### Document approval

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Rev A01	01/08/2023			Incomplete sections to be completed and reviewed.
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## Executive Summary

Sydney Metro has engaged the CPB Contractors Ghella Joint Venture (CPBG) for the design and construction of the Station Boxes and Tunnelling Works (SBT Works) of the Sydney Metro Western Sydney Airport project (the Project).

The SBT Works involve the construction and operation of a new 23 km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and the Aerotropolis (at Bringelly) in the south. The Project includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections.

The Aerotropolis Station site ("the SBT Site") is to be redeveloped for open space and commercial land use. Commercial areas will predominately be covered in hard pavements (i.e. buildings, roads and parking) with minimal soft landscaping. This type of land use is analogous with a commercial/industrial land use as defined in Schedule B7, Section 3.2.4 of the ASC NEPM.

Open Space areas within the SBT Site include the Central Park and the western end of a Pedestrian only street. The ASC NEPM defines open space land use as parks, playgrounds, playing fields and recreational areas which are fully accessible to the general public.

CPBG has engaged Tetra Tech Major Projects Pty Ltd (TTMP) to provide geotechnical, hydrogeological and contaminated land services associated with the design and construction of the SBT Works.

The Detailed Site Investigation (DSI) for the SBT Site identified the requirement for the remediation of materials in the Medium Impact Area (refer to Figure on next page) including topsoil/fill materials with asbestos and soil materials impacted with PFAS. Materials in the Low Impact Areas are not considered to pose unacceptable risks to human health or the environment for a commercial/industrial land use. As such, it is considered that remediation is not required for the Low Impact Areas.

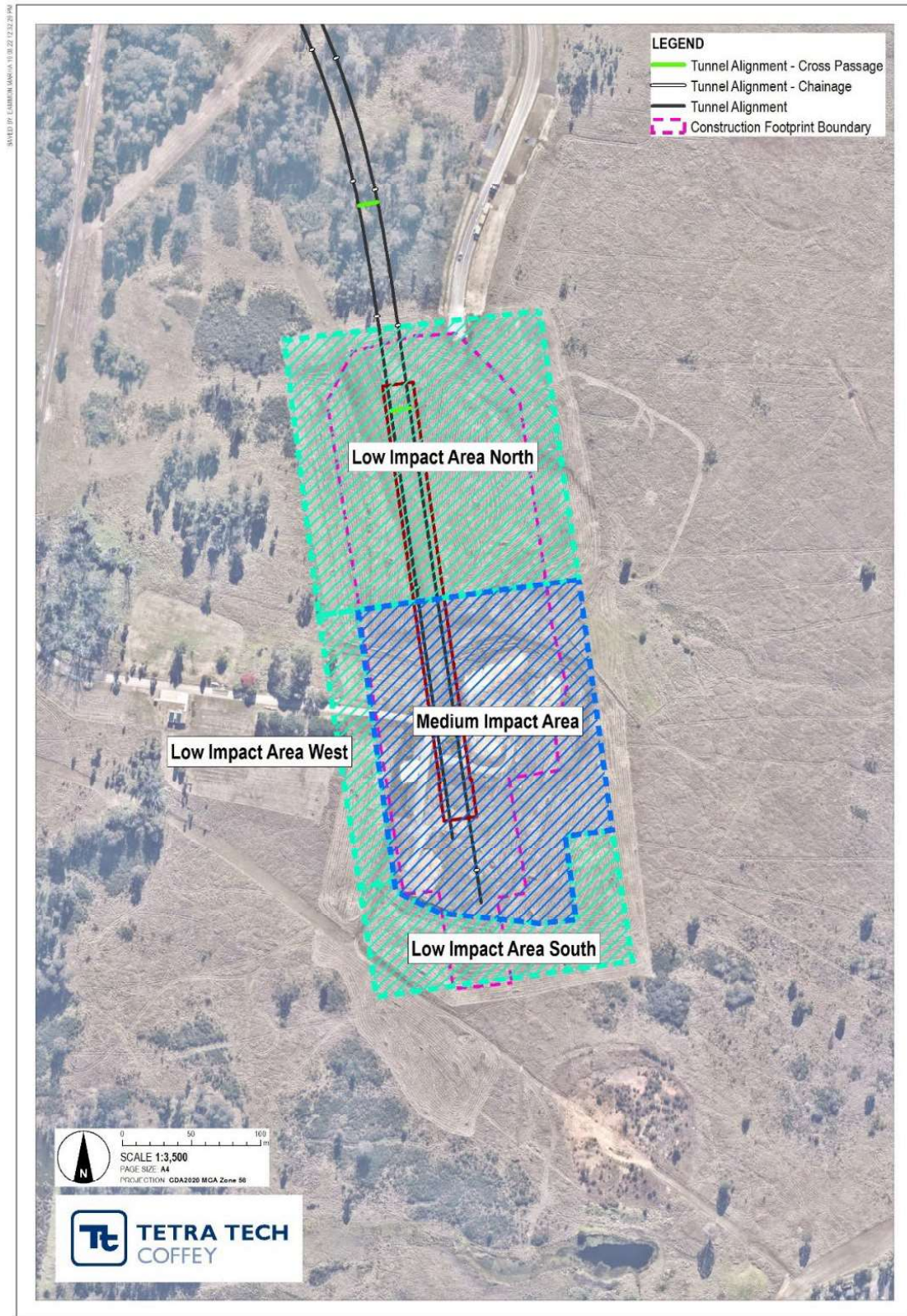
The remediation strategy required by Sydney Metro to mitigate risks from asbestos and PFAS materials is the removal of contamination sources such that the SBT Site is made suitable for commercial and open space land use as per the configuration of the SBT Site shown in Figure 3, Appendix 1.

Reduction in flux of PFAS migrating off-site via surface and groundwater pathways was expected to be achieved through a combination of removal of PFAS-impacted soil, introduction of hardstand pavement and stormwater drainage in commercial land use areas that will substantially reduce infiltration through soils containing residual levels of PFAS.

Remediation of the SBT Site was undertaken in general accordance with the TTMP (2023) *Aerotropolis Remedial Action Plan, SMWSASBT-CPG-SWD-SW000-GE-RPT-040527, 5 June 2023, Rev A03*.

Based on the implementation of the RAP, the information considered and reviewed in this Validation Report, and the intended future land use of the SBT Site, TTMP considers that potential risks from asbestos and PFAS contamination have been adequately mitigated and the SBT Site is suitable for commercial and open space land uses as shown in Figure 3, Appendix 1.





Aerotropolis Low and Medium Impact Areas





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## Abbreviations

Abbreviation	Definition
ACM	Asbestos-Containing Material
ADE	ADE Consulting Group Pty Ltd
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ARC	Australian Reinforcing Company
ASS	Acid Sulfate Soils
ATM	Airport Terminal Station
BSF	Bringelly Services Facility
CEMP	Construction Environmental Management Plan
CLM	Contaminated Land Management
CMF	Claremont Meadows Services Facility
COPC	Contaminant of Potential Concern
CPBG	CPB Ghella Joint Venture
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Plan
ENM	Excavated Natural Materials
EPL	Environmental Protection License
HHRA	Human Health Risk Assessment
MIP	Membrane Interface Probe
NAPL	Non-Aqueous Phase Liquids
PFAS	Per- and Polyfluoroalkyl Substances
PFOS	Perfluorooctane Sulfonic Acid
POEO	Protection of the Environment Operations
PRB	Permeant Reactive Barrier
RAAF	Royal Australian Air Force
RAP	Remedial Action Plan

Abbreviation	Definition
SMF	Synthetic Mineral Fibre
SSRA	Site-Specific Risk Assessment
SSTOM	Stations Systems Trains And Operations And Maintenance
TBM	Tunnel Boring Machine
UST	Underground Storage Tank
VCH	Volatile Chlorinated Hydrocarbons
VENM	Virgin Excavated Natural Materials
WHS	Work Health and Safety
WSI	Western Sydney International

## 1. Introduction and Background

Sydney Metro has engaged the CPB Ghella Joint Venture (CPBG) for the design and construction of the Station Boxes and Tunnelling Works (SBT Works) of the Sydney Metro Western Sydney Airport project (the Project).

For the purpose of this Validation Report, the Aerotropolis site is located at 215 Badgerys Creek Road, Bringelly NSW 2556 (the SBT Site) as outlined in Table 4 in Section 4, and shown on Figure 1A in Appendix 1. The SBT Site relates to the proposed Aerotropolis Sydney Metro Station.

TTMP has prepared the following documents for the SBT Site which were endorsed by the SBT Site Auditor:

- Aerotropolis Detailed Site Investigation, SMWSASBT-CPG-SWD-SW000-GE-RPT-040515, 13 November 2022, Rev A06 (TTMP, November 2022) (“the DSI”).
- Aerotropolis Remedial Action Plan, SMWSASBT-CPG-SWD-SW000-GE-RPT-040527, 5 June 2023, Rev A03 (TTMP, June 2023) (“the RAP”).

SBT Works at the SBT Site includes demolition of existing buildings/structures, establishment of temporary offices, amenities, car parking and access roads, site levelling, piling and bulk excavation of the station box (a rectangular structure with an area of approximately 8,000 m<sup>2</sup>) to approximately 52 m Australian Height Datum (AHD), reuse of excavated material, and remediation activities required under the RAP to make the SBT Site suitable for its intended use.

Final fit out works to complete the Aerotropolis Sydney Metro Station including lining of the station box such that it will comprise an undrained (tanked) structure is outside the scope of the SBT Works and will be completed under a Stations Systems Trains and Operations and Maintenance (SSTOM) works package.

The SBT Site is to be redeveloped for commercial and open space land uses as shown in Figure 3, Appendix 1. Figure 3, Appendix 1 incorporates landscape areas provided by Sydney Metro on the 24 May 2023 in DRG No. SWMSAEDS-SMD-AEC-AT-DRG-100200, Rev D, 12 December 2022.

TTMP was engaged to prepare this validation report to document the remediation and validation works carried out at the SBT Site as part of the SBT Works.



## 1.1. Project Overview

The SBT Works involves the construction and operation of a new 23 km metro rail line from the existing Sydney Trains suburban T1 Western Line (at St Marys) in the north and Aerotropolis in the south at Bringelly. The Project includes tunnels and civil structures, including a viaduct, bridges, and surface and open-cut troughs between the two tunnel sections. Figure A overleaf shows the proposed alignment and key features of the Project and the approximate location of the SBT Site.

The SBT Works are divided into two parts:

- SBT North: SBT Site to Orchard Hills Station. St Marys Station is an existing heritage-listed suburban rail station. Orchard Hills is a new station for the Sydney Metro line and will include the portal dive structure. Claremont Meadows Services Facility (CMF) is included along this alignment.
- SBT South: Airport business park dive structure to the Western Sydney Airport Aerotropolis station. This section of the Project passes largely through greenfield land, with construction both on and off-airport land. The Airport Terminal Station (ATM) and Bringelly Services Facility (BSF) are included along this alignment.

Key elements on the SBT Works include:

- Two sections of twin tunnels with a combined length of approximately 9.8 km, plus associated portal structures. This includes one section from St Marys to Orchard Hills and the other under Western Sydney International (WSI) airport to the new Aerotropolis Sydney Metro Station.
- Excavations at either end to enable trains to turn back, and stub tunnels to enable future extensions.
- Station box excavations with temporary ground support for four new Metro stations at St Marys, Orchard Hills, Airport Terminal and Aerotropolis (i.e. the SBT Site).
- Excavations associated with two intermediate services facilities; one in each of the tunnel sections at Claremont and Bringelly.

## SYDNEY METRO - WESTERN SYDNEY AIRPORT STATION BOXES AND TUNNELLING WORKS



Figure A: Overview of SBT Works

## 1.2. Requirements to Prepare a Validation Report

Table 1 summarises Project documentation relevant to the preparation of a Validation Report for the SBT Works at the SBT Site.

Table 1: Requirements and Recommendations for a Validation Report for the SBT Works at the SBT Site.

Document	Comment
Environmental Impact Statement (EIS) and Submissions Report	The Contamination Technical Paper of the EIS and Submissions Report included a mitigation measure (SC3) for off-airport areas regarding the preparation of a RAP where additional data review and detailed site investigation confirmed that contamination would require remediation. Condition SC3 states that "Remediation would be performed as an integrated component of construction and to a standard commensurate with the proposed end use of the land."
Infrastructure Approval	Condition E95 of Sydney Metro Western Sydney Airport – Conditions of Approval (SSI 10051) requires that "Validation Report(s) must be prepared in accordance with Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA, 2020) and relevant guidelines made or approved under Section 105 of the Contaminated Land Management Act 1997 (NSW)".  Validation Report(s) must be submitted to the Planning Secretary and the Relevant Council(s) for information.
Design and Construct (D&C) Deed	The Project D&C Deed <sup>1</sup> states that each Validation Report, Site Audit Statement and Site Audit Report must relate to each area where a Detailed Site Investigation is performed in accordance with clause 12.19, be prepared using Good Industry Practice and in accordance with the requirements of Law, the Planning Approvals, all guidelines made or approved by the EPA and any other requirements of this deed. The Deed also describes specific requirements of the Validation Report which are described in Table 2.
RAP	Section 14 of the RAP states that at the completion of the SBT Works, a Validation Report shall be prepared documenting the works completed at the SBT Site. Section 14 also describes the information to be included in the validation report which is summarised in Table 2. In addition the Validation Report shall be prepared in general accordance with guidance published and/or endorsed by the NSW EPA relating to the assessment and management of contaminated land.

Table 2: Deed Requirements in Relation to Preparing Validation Reports

Deed Item	Included in Validation Report	Validation Report Reference
i. Validation Report must:		
a. describe the remediation activities completed;	✓	11
b. present all relevant information and data to demonstrate that risks associated with Contamination have been mitigated to an acceptable level;	✓	10 to 14
c. be reviewed and approved by a Certified Contaminated Land Consultant and endorsed by an Accredited Site Auditor; and	Note 1	Cover Page
d. be accompanied by an Interim Site Audit Advice produced by the Accredited Site Auditor.	Note 1	N/A

<sup>1</sup> Sydney Metro - Western Sydney Airport Station Boxes and Tunnelling Works Design and Construction Deed Contract No: WSA-200-SBT



Note 1: review and endorsement by an Accredited Site Auditor to be provided in a separate documentation.

Table 3: RAP Section 14 Validation Report Requirements

Validation Report Item	Included in Validation Report	Validation Report Reference
Information demonstrating compliance with appropriate regulations and guidelines.	✓	3
Information demonstrating compliance with this RAP.	✓	11 to 14
Validation completed as per the requirements of Sections 11, 12 and 13 of the RAP.	✓	11 to 14
Any variations to the strategy undertaken during the implementation of the remedial works.	N/A	N/A
Details of the source, classification and suitability of all imported materials.	✓	11.8
Details of any environmental incidents and/or unexpected finds of contamination occurring during the course of the SBT Works and the actions undertaken in response to these incidents.	✓	11.5
Details on waste classification, tracking and off-site disposal (including environment protection licence (EPL) details).	✓	11.6.3 11.6.4
Details on the reuse of materials on site and/or offsite within the FS01 site, if any. This is to include the location of where materials have been cut and reused on the SBT Site.	✓	11.7
Details of importation of VENM/ENM/ENM	✓	11.8
On-site material tracking to demonstrate validation of remediation works such that the SBT Site has been made suitable for the proposed land uses.	✓	11 to 12
Survey data of remediation areas post-remediation to demonstrate the required remediation extents have been achieved.	✓	11 Appendix 3
Clear statement of the suitability of the SBT Site that is the subject of the validation report, for the commercial and open space land uses shown in Figure 3, Appendix 1.	✓	15

## 2. Validation Report Objective

NSW EPA guidance<sup>2</sup> defines the objective of a Remediation and Validation Report as being “to detail the site work undertaken and demonstrate compliance with the remedial action plan for the site, and compliance with contaminated land guidelines and all other applicable regulatory requirements”.

The Validation Report must:

- Clearly describe the remedial works undertaken, the validation carried out and the final condition of the SBT Site.
- Confirm statistically that the remediated site complies with the remediation criteria set for the SBT Site.
- Assess the results of the post-remediation testing against the remediation criteria stated in the RAP. Where these criteria have not been achieved, reasons must be stated and additional site work proposed to achieve the original objectives, or a management plan put in place.

TTMP has prepared this Validation Report in general accordance with the reporting requirements for a Validation Report outlined in guidelines presented in Section 3.

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<sup>2</sup> Section 1.5, NSW EPA (May 2020) “Consultants reporting on contaminated land”

### 3. Technical and Regulatory Framework

This Validation Report has been prepared in general accordance with the following legislation, industry standards, codes of practice, and guidance documents, where relevant:

- NSW Work Health and Safety (WHS) Act 2011 (WHS Act 2011)
- NSW WHS Regulation 2017 (WHS Regulation 2017)
- Contaminated Land Management (CLM) Act, 1997 (CLM Act 1997).
- Protection of the Environment Operations (POEO) Act 1997 (POEO Act 1997)
- POEO (Waste) Regulation 2014 (POEO Waste Regulation 2014)
- National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (amended April 2013) (ASC NEPM)
- NSW EPA Contaminated Land Guidelines: Consultants Reporting on Contaminated Land, 2020 (NSW EPA 2020)
- NSW EPA Sampling Design Guidelines for Contaminated Land (Part 1 and Part 2), 2022 (NSW Sampling Design Guidelines)
- NSW EPA Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition), 2017 (NSW EPA 2017)
- Per- and polyfluoroalkyl substances (PFAS) National Environmental Management Plan (HEPA, 2020; Version 2.0) (PFAS NEMP)
- CRC Care Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, 2011 (CRC CARE 2011).
- NSW EPA (2014) Managing Asbestos in or on Soil
- WA DOH (2021) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia
- NSW EPA Waste Classification Guidelines.



## 4.SBT Site Information

### 4.1. SBT Site Identification

The SBT Site is located in Bringelly and is shown in Figure 1A in Appendix 1. Key attributes of the SBT Site are summarised in Table 4.

Table 4: Site Information

Attribute	Description
Address	215 Badgerys Creek Road, Bringelly NSW 2556
SBT Site Area	Approximately 5.27 ha
Title Identification Details	Part Lot 3101 DP1282964. Note Lot 3101 DP1282964 is referred to in this document as 'the Property'.
Current Land Use	SBT Project Construction site and cleared vacant land
Current Land Zoning	Unzoned within SBT Site (as part of the metro line transport corridor). Surrounding land zoning includes Mixed Use, Enterprise and Environmental and Recreational
Adjoining Land Uses	Low density residential acreage lots are located west, and further east and south of the Property. Thompsons Creek is located along the southern and eastern boundary of the Property. A large rural grazing lot is located north of the Property.

### 4.2. Site Description (Pre-Construction)

At the time of preparing the RAP, the SBT Site was an active construction site associated with the SBT Works. Topsoil/fill materials had been stripped over the majority of the Remediation Area and the bulk excavation of the Station Box was in progress.

The following, where noted has been summarised from the RAP which was based on observations made by TTMP in 2022 prior to site establishment and Preparatory Works by CPBG. A recent description of the SBT Site (post remediation) is provided in Section 11.3.

Based on the DSI the SBT Site was subdivided into four main areas which are shown in Figure B over page which includes the Medium Impact Area (roughly the central portion of the SBT Site), Low Impact Area North, Low Impact Area South and Low Impact Area West. The basis for the determination of these areas relates to the contamination impact profile, which is described in detail in the DSI report.

#### 4.2.1. Medium Impact Area

Land in the Medium Impact Area comprised infrastructure associated with the former Department of Defence (RAAF) radar receiving station shown in Figure 1B, Appendix 1.

Demolition and removal of infrastructure associated with the former RAAF receiving station was undertaken by Sydney Metro in March/April 2022 prior to the commencement of the SBT Works. Information on the demolition activities undertaken is included in Section 3.4 of the DSI report and in summary included:

- Demolition of buildings and removal of building footings at the former Defence Overseas Telecommunications Radio Station Complex (OTC) site.

- Removal of a 1,600 m<sup>3</sup> stockpile of contaminated soil located south of the buildings at the OTC.
- Removal of an underground petroleum storage system (UPSS) and the completion of a surface scrape of soil from the base and side walls of three UPSS pits. The GHD Investigation notes no visual or olfactory signs of contamination were present in the pits.
- Removal of a septic tank and the completion of a surface scrape of soil from the base and side walls of the tank pit. The GHD investigation notes no visual or olfactory signs of contamination were present in the tank pits.
- Completion of an emu pick to remove visible asbestos containing materials (ACM) following the completion of demolition activities by EnviroPacific.

#### 4.2.2. Low Impact Areas

Land within the Low Impact Areas was cleared, and vacant land that was predominately covered in grass.

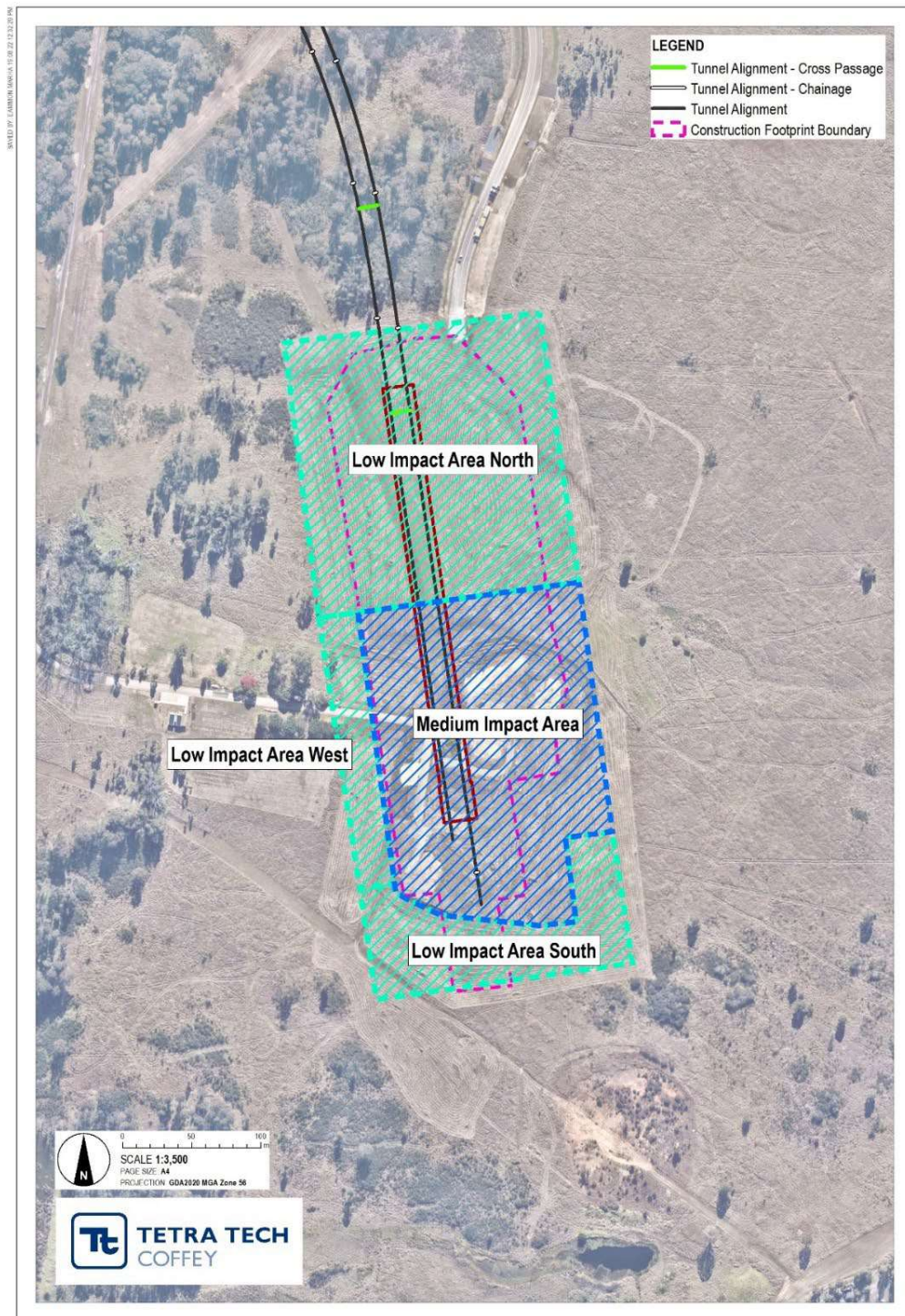


Figure B: Aerotropolis Impact Areas: Medium Impact Area is shown in blue hatching

## 5.Environmental Setting of the SBT Site Summary

The following presents a summary of the environmental setting of the SBT Site and surrounding land.

Table 5: Environmental Setting of SBT Site and surrounding land

Aspect	Description
Topography	A topographic plan and surface water drainage plan of the Property is provided in Figure 2, Appendix 1. The station box is situated at an elevation of approximately 70 m Australian Height Datum (AHD). At the northern end of the station box, the land slopes in an east-south-east direction to Thompsons Creek which is located approximately 500 m east of the Aerotropolis Station Box. At the southern end of the station box, the land slopes in a southeast direction towards Moore Gully and Thompsons Creek.
Geology	<p>A review of the Penrith 1:100 000 scale geology map<sup>3</sup> indicates that the SBT Site is underlain by Bringelly Shale of the Wianamatta Group. The Bringelly Shale is described as shale, carbonaceous claystone, laminite, lithic sandstone, with rare coal.</p> <p>A geological cross-section of the SBT Site pre-construction is provided in Appendix 2.</p> <p>Prior to the commencement of construction works, the geology of the SBT Site comprises fill material (~ 0.2 m to ~ 0.5 m thick), which is underlain by residual soils comprised of Silty Clay (~ 2 m thick) derived from the weathering of the Shale bedrock. The thickness of soils varies along the alignment and is approximately 3m in the northern end, ~ 2 m to ~ 4 m in the central portion of the station box, and ~ 2m at the southern end of the station box. Soils are underlain by the Bringelly Shale.</p> <p>At the completion of the remediation the geology of the SBT Site was comprised of residual soil materials, site won spoil materials which had been reused for site levelling (refer to Section 11.7), imported materials which had been used for site levelling purposes and haul roads (refer to Section 11.8) and the underlying Bringelly Shale.</p>
Hydrogeology	Groundwater at the SBT Site has been measured at approximately 66 m to 72 m AHD within the Bringelly Shale. A groundwater elevation of 67m AHD is considered typical in the vicinity of the Aerotropolis station box. Groundwater flows in a south-east to easterly direction towards Thompsons Creek (TTC, 2021) <sup>4</sup> .
Registered Groundwater Bores	The nearest registered groundwater bores (GW113438, GW113439, GW113440) are located within the Property and between 30 m and 130 m southwest of the station box. The bores were installed for monitoring purposes.
Salinity	A review of the map indicates that the SBT Site is mapped as having moderate salinity.
Acid Sulfate Soils	The Atlas of Australian Acid Sulfate Soil (ASS) compiled by CSIRO <sup>5</sup> was reviewed to assess the probability of occurrence of ASS within the SBT Site. The ASS risk plan indicates that the SBT Site is located in an area with Extremely Low Probability of Occurrence of ASS.

<sup>3</sup> Geological Survey of Penrith 1991. Surface geology of New South Wales - 1:1 100 000 map. Geological Survey of New South Wales, NSW Department of Primary Industries, Maitland, Australia

<sup>4</sup> TTC (2022) *Western Sydney Airport Station Boxes and Tunnels Tender, Hydrogeological Interpretative Report*.

<sup>5</sup> <http://www.asris.csiro.au/>



Aspect	Description
List of Contaminated Sites Notified to the EPA	A search of the List of NSW Contaminated Sites Notified to NSW EPA <sup>6</sup> (as of 8 March 2022) was carried out on 17 May 2022. The SBT Site is not recorded on the register.
NSW EPA Contaminated Land Public Record	A search of the NSW EPA Contaminated Land Public Record was carried out on 17 May 2022 for declaration notices, orders made by the EPA under the CLM Act 1997, voluntary management proposals approved under the CLM Act 1997, and site audit statements relating to significantly contaminated land. The search of the database revealed that the SBT Site, or properties within 250 m of the SBT Site, were not present on the contaminated land public record.

## 6.Site History Summary

The following has been summarised from the DSI which is based on information presented in the EIS and review of historical aerial imagery available through the NSW Government Historical Imagery portal:

- The Property was historically used for agricultural purposes.
- The Property was acquired by the Department of Defence (Defence) and the SBT Site was used as a RAAF radar receiving station from the 1950s to approximately 2005 when the station was demolished.
- Historical aerial imagery shows Defence housing was present north of the main radar receiving station building in 1955.
- By 1984, a telecommunication radio station along with multiple houses were present. The houses on were demolished between 1991 and 1998.
- In 2004 selected buildings surrounding the telecommunication radio station were also demolished.
- A photograph from 2013 shows that a bushfire occurred on the southern portion of the SBT Site, surrounding some of the buildings.
- The SBT Site was vacant and not used from the mid-2000s to the 2022. Buildings and the remaining infrastructure on the SBT Site were demolished and removed in April-May 2022 (refer to Section 4.2.1 for a description of demolition activities).

<sup>6</sup> <https://www.epa.nsw.gov.au/your-environment/contaminated-land/notification-policy/contaminated-sites-list>

## 7. Summary of Previous Reports

The primary sources of information used to inform the remedial strategy outlined in the RAP included the following:

- TTMP (2022) Aerotropolis Detailed Site Investigation - Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works. Prepared for CPBG. Ref: SMWSASBT-CPG-SWD-SW000-GE-RPT-040515. Revision: A06. 13 November 2023
- GHD (2022) Sydney Metro Western Sydney Airport - Aerotropolis Station Box Compound Assessment
- ERM (2022) Detailed Site Investigation Bradfield City Centre, 11 October 2022 ("the Bradfield DSI")
- Supplementary investigation locations completed post commencement of construction of the SBT Project including:
  - locations completed within the station box to assess materials as VENM or Excavated Natural Material (ENM) (refer to Section 11.6.3)
  - locations completed in May 2023 to further delineate natural materials with concentrations of PFAS which exceed the remediation criteria (refer to Appendix 6.5 of the RAP).

Other previous investigations considered in the DSI (and RAP) are summarised in Table 6.

Table 6: Previous Reports

Investigation	Former RAAF Receiving Station	Whole of Property	Aerotropolis Station Box	Aerotropolis Construction Footprint	New Access Road Aerotropolis to Badgerys Creek Road
Golder (2011a) Former RAAF Bringelly Receiving Station – Detailed Site Investigation	✓				
Golder (2011b) Hazardous Building Materials Assessment	✓				
Golder (2014) Bringelly Receiving Station – Remedial Action Plan	✓				
Thuroona Services and Western Environmental (2019) 215 Badgerys Creek Road, Bringelly, NSW, Detailed	✓	Note 1			
ERM (2021a) Aerotropolis Core Precinct – Review of contamination issues (preliminary final)		Note 1	✓		
ERM (2021b) Aerotropolis Core Precinct – Targeted site investigation		✓	✓		
AECOM (2021) Contamination Investigation Report - 215 Badgerys Creek Road, Bringelly, NSW					✓
Cardno (Nov, 2021); Contamination Assessment Report – Phase D/E, Sydney Metro Western Sydney Airport (Ref: 80021888; RevB, dated 22nd November 2021)			✓		
Cardno (May 2021); Contamination Assessment Report, Sydney Metro Western Sydney Airport (Ref: 80021888; dated 5th May 2021)			✓		
Golder & Douglas Partners (Feb 2021); Factual Contamination Report – Preliminary Site Investigation (Ref: 19122621-003-R-Rev3; Rev3; dated 19th February 2021).			✓		



Investigation	Former RAAF Receiving Station	Whole of Property	Aerotropolis Station Box	Aerotropolis Construction Footprint	New Access Road Aerotropolis to Badgerys Creek Road
GHD (2022) Sydney Metro Western Sydney Airport - Aerotropolis Station Box Compound Assessment			Note 2	✓	
TTMP (2022) Aerotropolis Detailed Site Investigation - Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works. Prepared for CPBG. Ref: SMWSASBT-CPG-SWD-SW000-GE-RPT-040515. Revision: A06. 13 November 2023				✓	
ERM (2022) Detailed Site Investigation Bradfield City Centre, 11 October 2022 ("the Bradfield DSI")		Note 3			

Notes:

1. limited consideration to the whole of property (Lot 10 DP 1235662 and Lot 2714 DP 1128906)
2. The investigation undertaken by GHD was generally limited to soil materials less than 2 m bgs. Sampling from soil/rock materials which make up the bulk of the excavation for the station box was not undertaken.
3. The Bradfield DSI included an assessment of the Whole of the Property with the exception of the SBT Site.

## 8. Site Characterisation

This section provides a summary of the SBT Site conditions at the time of the preparation of the RAP. Further detail is provided in the DSI report. Post remediation and validation conditions at the SBT Site is discussed in Section 11.3, Section 11.4 and Section 14.

### 8.1. Pre-Construction Ground Conditions

Ground conditions within the Medium Impact Area comprised a layer of variable fill overlying natural residual Clay and Bringelly Shale.

Fill materials within the Medium Impact Area contained asbestos that was randomly distributed.

PFAS was present at concentrations exceeding the adopted site assessment criteria in four areas of concern (refer to Figure C), which was attributed to historical storage and use of aqueous film forming foams (AFFF) containing PFAS, a former septic system and contaminated soil stockpile. All other contaminant of potential concern (COPC) were reported below the assessment criteria in samples collected from the Medium Impacted Area.

Elevated concentrations of PFAS were predominately located within the top 1 m of soil material in these areas. PFAS in soil at the SBT Site poses a potentially unacceptable risk to future off-site human receptors (residential receptors), groundwater and surface water receptors, and terrestrial and aquatic ecological receptors.

PFAS was found in groundwater which exceeded the adopted human health guidelines (drinking water guidelines) and ecological guidelines (99% species protection). PFAS was also found to be migrating off-site via surface water in previous investigations. PFAS was also confirmed to be present in Thompsons Creek. Probable off-site sources of PFAS were identified in previous investigations.

In Low Impact Areas ground conditions were observed to comprise thin layer of clay fill (reworked natural ground) which was underlain by residual Clay and Bringelly Shale. Soil materials with visual / olfactory signs of suspected contamination and potential asbestos containing materials (PACM) were not observed in the test pits or boreholes, or site observations made during the intrusive investigation works completed in this part of the SBT Site in the Low Impact Area. COPC in the low impact areas were below the adopted site assessment criteria.

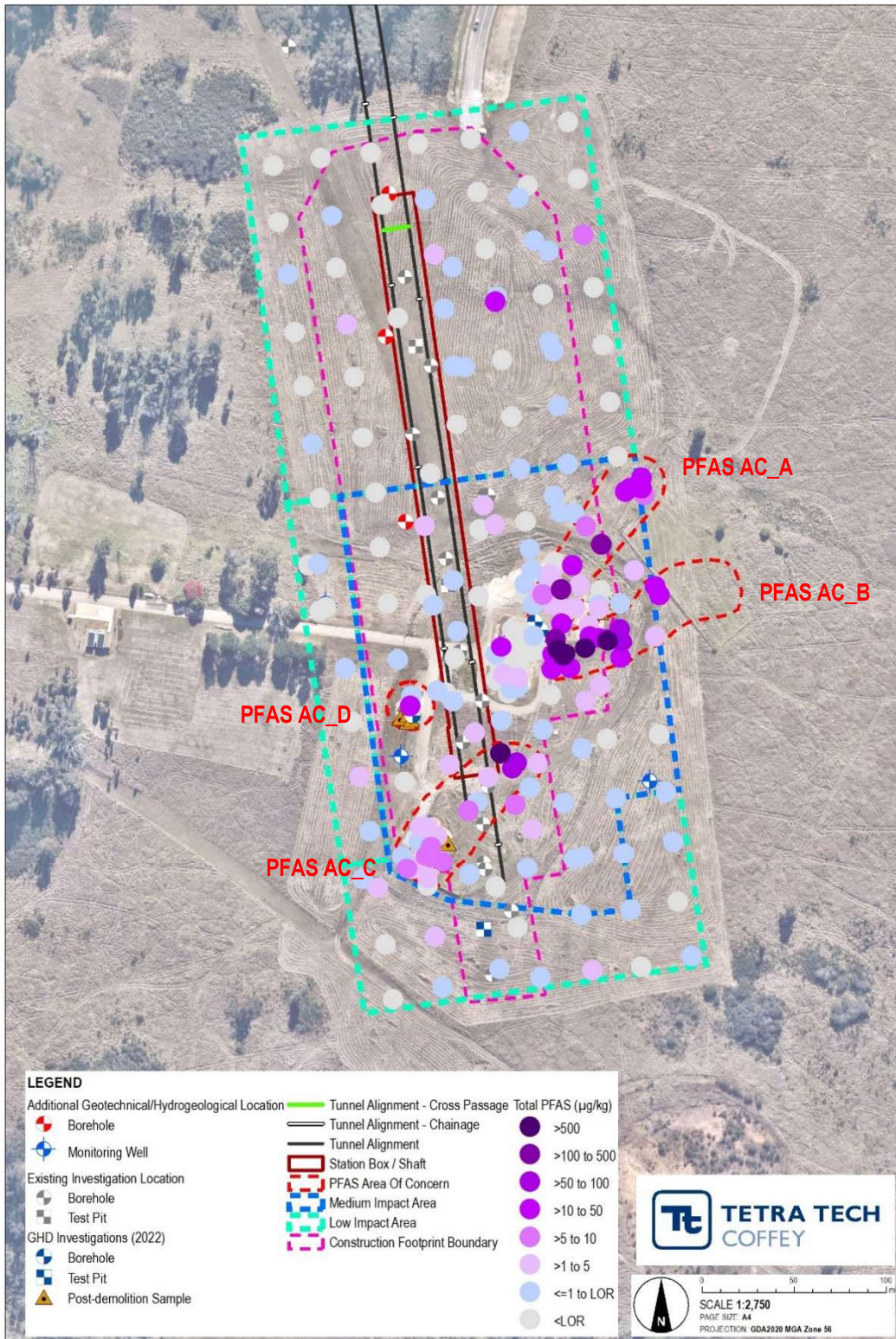


Figure C: PFAS Areas of Concern (AC) in the Medium Impact Area

## 8.2. Contamination in Soil

At the time of the preparation of the RAP construction of the Project at SBT Site was in progress. The following provides a summary of contamination at the SBT Site at the time of preparing the RAP.

### 8.2.1. Investigation Data Overview

Investigation locations and data sources which were used in the development of the RAP are shown in Figure 4A to Figure 4G in Appendix 1, and include:

1. TTMP DSI locations
2. Previous investigation locations completed for the SBT Project
3. Supplementary investigation locations completed post commencement of construction of the SBT Project including:
  - a) locations completed within the station box to assess materials as VENM or ENM (refer to Section 11.6.3).
  - b) locations completed in May 2023 to further delineate natural materials with concentrations of PFAS which exceeded the remediation criteria (refer to Figure 4B to Figure 4E in Appendix 1).

Tabulated soil results for items 1), 2) and 3b) are included in Appendix 4. The tabulated results in Appendix 4 include a comparison of the results with the remediation criteria referred to in Section 10.3. Tables included in Appendix 4 include:

- Appendix 4.1 provides the data for the SBT Site for commercial land use areas, and a comparison of these results to the remediation criteria for commercial land use.
- Appendix 4.2 provides the data for the SBT Site for open space land use, and a comparison of these results to the remediation criteria for open space land use.

Tabulated soil results for item 3 a) relate to undisturbed residual Clay and Bringelly Shale materials assessed as VENM in the station box. These results indicate such materials did not require further consideration in the RAP.

### 8.2.2. Asbestos

At the time of preparing the RAP<sup>7</sup> Sydney Metro had issued an instruction to CPBG to excavate and remove topsoil/fill materials from the Medium Impact Area based on the potential for asbestos. A portion of the materials excavated had been disposed off-site to an appropriately licenced waste management facility, and the remainder stockpiled on the SBT Site (refer to Section 11.2.1 for further information). The area where the materials were stockpiled was referred to as **ACM Remediation Area 1** in the RAP, and is shown in Figure 7B, Appendix 1. Based on the remediation objectives (refer to Section 10.2) and remediation strategy (refer to Section 10.1) the stockpiled materials were not considered suitable to be retained on-site and were required to be disposed off-site to an appropriately licenced waste management facility.

<sup>7</sup> Note prior to the preparation of the *Aerotropolis Remedial Action Plan*, SMWSASBT-CPG-SWD-SW000-GE-RPT-040527, 5 June 2023, Rev A03 (TTMP, June 2023), a RAP based on the containment of contamination had been prepared and was in place on the SBT Site. The RAP based on containment has now been superseded by the RAP ref SMWSASBT-CPG-SWD-SW000-GE-RPT-040527, Rev A03.



The RAP also identified an area of land between the eastern most boundary of the Medium Impact Area and the SBT Site boundary where fill/topsoil materials were present with the potential for asbestos. The RAP defined this area as **ACM Remediation Area 2** and is shown in Figure 7A, Appendix 1. Under the RAP topsoil and fill materials within this area were to be excavated and disposed off-site to an appropriately licenced waste management facility.

### 8.2.3. Metals

Metal concentrations (mainly zinc, and to a lesser extent nickel and copper) exceeded the ecological remediation criteria in a limited number of samples from fill or other shallow soil materials (materials less than 0.3 m bgs). No further remediation or validation of these materials was proposed in this RAP noting that the samples exceeding these criteria were to be removed based on the presence of fill/topsoil materials which require remediation (refer to Section 10.4.1) and are located in an area proposed for commercial land uses where managed landscaping is typically established in imported soil/growing mix in discrete areas such as planter boxes / garden beds.

### 8.2.4. PFAS

At the time of preparing the RAP a portion of PFAS impacted soil materials which exceeded the Remediation Criteria had been removed in association with the removal of topsoil/fill material in the Medium Impact Area or in association with the site establishment and construction works. The RAP identified that further remediation in these areas was not required with regard to PFAS. This applied to PFAS Areas of Concern PFAS AC\_C and PFAS AC\_D shown in Figure C.

However at the time of preparing the RAP remedial activities which specifically target the removal of PFAS impacted natural soil materials has not been undertaken. The RAP identified that excavation and off-site disposal of PFAS impacted soils was required in PFAS AC\_A and, and PFAS AC\_B, and identified three main areas which require remediation. These areas are shown in Figure 7A, Appendix 1 and are summarised in Table 7.

Table 7: PFAS Remediation Areas

Remediation Area	Sample Location Exceeding Remediation Criteria	Required Excavation Depth m bgs (pre stripping ground levels)	Required Excavation Depth m bgs (post stripping ground levels, refer to Note 1)	~ Excavation Area (m <sup>2</sup> )	~ Excavation Volume (bank) (m <sup>3</sup> )	Comment (refer to Note 2 for definition of LV, L and V)
PFAS Remediation Area 1A	SBT-BH-4259	1	0.7 (Note 1)	552	387	<p>The extent of material requiring remediation in this area to 1 m bgs has been delineated laterally and vertically based on the following intrusive investigation locations.</p> <ul style="list-style-type: none"> <li>• SBT-BH-4261 (LV)</li> <li>• C-V002 / C-V001 (L)</li> <li>• A2_55 (LV)</li> <li>• SBT-BH-4255 (LV)</li> <li>• SBT-BH-4254 (LV)</li> <li>• A2_62 (LV)</li> <li>• A2_63 (LV)</li> <li>• A2_59 (LV)</li> <li>• A2_65 (LV)</li> <li>• A2_66 (LV)</li> <li>• SBT-BH-4264 (LV)</li> <li>• SBT-BH-4262 (LV)</li> <li>• SMWSA-GHD-BH29 (LV)</li> <li>• A2_61 (LV)</li> <li>• SBT-BH-4259 (V)</li> <li>• A2_60 (V)</li> </ul>
	SMWSA-GHD-BH30					
	SMWSA-GHD-BH31					
	SMWSA-GHD-TP52					
	A2_56					
	A2_58					
PFAS Remediation Area 1B	A2_60					
	SBT-BH-4258	2	1.7 (Note 1)	85	145	<p>The extent of material requiring remediation in this area to 2 m bgs has been delineated laterally and vertically based on the following intrusive investigation locations.</p> <ul style="list-style-type: none"> <li>• A2_57 (LV)</li> <li>• AS_56 (LV)</li> <li>• A2_59 (LV)</li> <li>• A2_58 (LV)</li> <li>• SBT-BH-4258 (V)</li> </ul>



Remediation Area	Sample Location Exceeding Remediation Criteria	Required Excavation Depth m bgs (pre stripping ground levels)	Required Excavation Depth m bgs (post stripping ground levels, refer to Note 1)	~ Excavation Area (m <sup>2</sup> )	~ Excavation Volume (bank) (m <sup>3</sup> )	Comment (refer to Note 2 for definition of LV, L and V)
PFAS Remediation Area 2	SBT-TP-4297	1	0.7 (Note 1)	318	223	The extent of material requiring remediation in this area to 1 m bgs has been delineated laterally and vertically based on the following intrusive investigation locations. <ul style="list-style-type: none"> <li>A4_43 (LV) to A4_50 (LV)</li> <li>SBT-BH-4368 (LV)</li> <li>SBT-TP-4267 (V)</li> </ul>
PFAS Remediation Area 3 (Note 3)	SBT-BH-4267 SMWSA-GHD-MW01 SMWSA_GHD_SED01	0.5	0.2 to 0.5 (Note 1)	165	50	The extent of material requiring remediation in this area to 0.5 m bgs has been delineated laterally based on the following intrusive investigation locations. <ul style="list-style-type: none"> <li>A5_41 (LV)</li> <li>SBT-TP-4300 (LV)</li> <li>SBT-BH-4267 (LV)</li> </ul>

**Notes:**

- 1) Within the PFAS remediation areas CPBG has advised that approximately 0.3 to 0.4 m of topsoil/fill materials have been removed. The required depth of excavation in PFAS Remediation Area 1A, 1B and 2 has assumed a stripping depth of 0.3 m. This amount has been subtracted from the depth of the required excavation based on pre-construction ground levels. PFAS Remediation Area 3 includes land which has been stripped and undisturbed land. The amount which needed to be removed from this area was approximately 0.2 m in stripped areas and 0.5 m in undisturbed areas. CPBG has survey data for these areas pre and post stripping. Prior to the commencement of excavation CPBG was to confirm the depth of materials stripped to confirm the target depth of the required excavation based on pre-construction ground levels has been achieved.
- 2) LV – location provides data to define lateral and vertical extent of remediation required; L – location provides data to define lateral extent of remediation required; V – location provides data to define vertical extent of remediation required.
- 3) PFAS Remediation Area 3 is located adjacent to ACM Remediation Area 2. Under the RAP the removal of PFAS impacted soil from PFAS Remediation Area 3 would also result in the removal of topsoil/fill materials which potentially contain asbestos from this area.

### 8.3. Groundwater and Surface Water

PFAS has been found in groundwater which exceeds the adopted human health guidelines (drinking water guidelines) and ecological guidelines (99% species protection). Detectable PFAS concentrations has also been found to be migrating off the SBT Site via surface water in previous investigations with concentrations which exceed 95% species protection. PFAS has also been confirmed to be present in Thompsons Creek.

Data from the DSI, and investigation completed within the Property indicate the presence of multiple PFAS sources which are contributing to PFAS in the environment including:

- PFAS source areas within the SBT Site
- Diffuse PFAS in soil/sediment in Lot 101 DP1282949 (the Property), and within this property the potential for secondary sources of PFAS along drainage lines down-gradient of the SBT Site
- Probable off-site sources of PFAS.

PFAS is present in groundwater up and down-gradient of the SBT Site. At the Property boundary and down-gradient of the SBT Site, PFAS is likely to be present in trace concentrations in groundwater above the PFAS 99% species protection level and below the 95% species protection levels.

PFAS is present in surface water in dry and wet conditions. Higher concentrations of PFAS in surface water occur in wet conditions in surface water discharged along drainage lines from PFAS sources areas at SBT Site, and potentially in surface water.

Surface water derived from land up-gradient of the SBT Site is currently diverted around the SBT Site via the diversion drain shown in Appendix 23.

## 9. Pre-Remediation Conceptual Site Model

The following table provide a refined CSM for source-pathway-receptor linkages for the SBT Site based on a commercial or open space land use. The table includes a summary of whether complete source-pathway-receptor linkages (exposure pathways) could occur. In regard to this summary, note:

- ‘Likely’ refers to an exposure pathway which could occur and if they occur there is potential for an unacceptable risk to the receptor (i.e. a complete exposure pathway)
- ‘Potential’ refers to an exposure pathway which could occur however further assessment would be required to establish whether an unacceptable risk to receptor could occur.
- ‘Unlikely’ refers to an exposure pathway which are considered unlikely to occur and therefore it is unlikely that there would be an unacceptable risk to receptor (i.e. an incomplete exposure pathway).
- ‘Not applicable’ refers to an exposure pathway which is not considered to be plausible and therefore incomplete.

Table 8: Refined Conceptual Site Model (Source-Pathway-Receptors)

Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway (without remediation)
Demolition materials from Previous Buildings and Structures	Asbestos	Fill/topsoil remaining in Remediation Area in stockpiles or in Asbestos Remediation Area 2	Inhalation of fibres	Construction workers involved with the SBT work	Likely
				Construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site.	Likely (Note 1)
				General public including persons who could be subject to contaminated media generated during redevelopment and post-construction	Likely (Note 1)
				General public accessing the station in the future	Likely (Note 1)
				Terrestrial ecological receptors within the SBT Site	Not applicable
Historical use of AFFF at former Defence facility	PFAS	Fill/soil in PFAS ACs in Medium Impact Area	Ingestion  Dermal contact	Workers involved with the SBT work, construction workers involved with the construction phase of the Sydney Metro SSTOM Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely
				General public including persons who could be subject to contaminated media generated during redevelopment.	Unlikely
			Biological uptake mechanisms	General public accessing the station if the future	Unlikely
				Terrestrial flora and fauna	Potential
			Aquatic flora and fauna including those Thompsons Creek	Unlikely	
		Surface water from PFAS ACs	Ingestion  Dermal contact	Workers involved with the SBT work, construction workers involved with the construction phase of the SSTOM Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely (Note 2)
				General public including persons who could be subject to contaminated media generated during redevelopment	Unlikely
			General public accessing the station if the future	Unlikely (Note 2)	
			Future residents hydraulically down-gradient of PFAS sources areas	Unlikely (Note 2)	

Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway (without remediation)
			Biological uptake mechanisms	Terrestrial flora and fauna within Lot 101 DP1282949 Aquatic flora and fauna including those Thompsons Creek Domestic animals within the Property	Potential Potential (Note 3) Potential
		Groundwater from PFAS ACs	Ingestion Dermal contact	Workers involved with the SBT work, construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site. General public including persons who could be subject to contaminated media generated during redevelopment General public accessing the station if the future Future residents hydraulically down-gradient of PFAS sources areas Terrestrial flora and fauna within the Property Aquatic flora and fauna including those Thompsons Creek Domestic animals and livestock within the Property	Not applicable  Not applicable Unlikely (Note 2) Unlikely (Note 2) Unlikely Potential (Note 3) Unlikely (Note 2)
		Terrestrial biota within Property	Consumption, bioaccumulation, biomagnification	Workers involved with the SBT work, construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site. General public including persons who could be subject to contaminated media generated during redevelopment General public accessing the station if the future Future residents hydraulically down-gradient of PFAS sources areas Terrestrial flora and fauna within the Property	Not applicable  Not applicable Unlikely Potential Potential

Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway (without remediation)
				Aquatic flora and fauna including those Thompsons Creek	Potential
				Domestic animals and livestock within the Property	Potential
	Aquatic biota in Thompsons Creek		Consumption, bioaccumulation, biomagnification	Workers involved with the SBT work, construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely
				General public including persons who could be subject to contaminated media generated during redevelopment	Unlikely
				General public accessing the station if the future	Unlikely
				Future residents hydraulically down-gradient of PFAS sources areas	Potential
				Terrestrial flora and fauna within the Property	Potential
				Aquatic flora and fauna including those Thompsons Creek	Potential
				Domestic animals and livestock within the Property	Potential

**Notes:**

- 1) Complete exposure pathway based on fill materials containing asbestos being currently located within the Remediation Area at the time the RAP has been prepared.
- 2) Receptor considered unlikely to ingest media based on use of potable water supply in area.
- 3) Receptor potentially exposed to contaminated media through migration of the media to the receptor.



## 10. Remediation Plan

### 10.1. Remedial Strategy

Based on the direction from Sydney Metro, the Remediation Strategy for the SBT Site is the removal of contamination sources such that the SBT Site is suitable for the commercial and open space land uses in the areas shown in Figure 3, Appendix 1.

The RAP identified that remediation of the SBT Site was required in the Medium Impact Area and the area of land between the Medium Impact Area and the eastern Site Boundary. In the RAP these areas combined were referred to as the Remediation Area which is shown in Figure 3, Appendix 1.

The RAP identified that remediation was not required in the Low Impact Areas.

### 10.2. Remediation Objectives

The primary objective for the remediation of the SBT Site is to make it suitable for commercial and open space land use as per the configuration of the SBT Site shown in Figure 3, Appendix 1, and without any requirement for the implementation of a LTEMP.

While not required to achieve the remediation objective, a secondary consideration of remediation is the reduction of PFAS migrating off-site via surface water and groundwater pathways.

### 10.3. Remediation Criteria

Remediation criteria for the SBT Site have been developed based on the adoption of generic Tier 1 screening criteria for these land uses based on the following guidelines:

- National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (April 2013) (ASC NEPM 2013) *Schedule B1 Guideline on Investigation Levels for Soil and Groundwater*.
- HEPA (2020) *PFAS National Environmental Management Plan Version 2.0 – January 2020*

The remediation criteria which have been developed are summarised in Appendix 6 and consider risk to human health and risk to terrestrial ecological receptors. Two sets of criteria have been developed. These include criteria for commercial land use, and separate criteria for open space land use.

The remediation criteria are considered to apply to asbestos and PFAS only.

The criteria developed for commercial land use apply to the areas of the SBT Site which are to be developed for commercial land use shown in Figure 3, Appendix 1. Similarly, the criteria developed for open space land use apply to the areas of the SBT Site which are to be developed for open space land use shown in Figure 3, Appendix 1.

#### 10.3.1. Surface Water and Groundwater

As noted in Section 10.2, a secondary consideration of remediation is the reduction of the flux of PFAS migrating off-site via surface water and groundwater pathways.

No measurable remediation criteria were included in the RAP for surface water and groundwater in relation to PFAS or in regard to the mobilisation of PFAS from soil to surface water/groundwater receptors.



Reduction in flux of PFAS migrating off-site via surface and groundwater pathways is expected to be achieved through a combination of removal of a portion of PFAS sources in soil from the SBT Site which exceed the remediation criteria, and the application of hardstand and modern drainage system to reduce infiltration in the commercial areas.

Under the Aerotropolis Precinct Plan, stormwater infrastructure (detention basins) is to be located up and down-gradient of the SBT Site (as well as other locations shown in the Aerotropolis Precinct Plan area). It is understood that these detention basins may be used for stormwater harvesting and irrigation in the local area. It is the responsibility of the future operator of water infrastructure to consider water quality (including the management of PFAS and potentially other contaminants) in surface water and its implications for stormwater harvesting/reuse in the area.

## 10.4. Materials Requiring Remediation and Validation

### 10.4.1. Fill Materials in Medium Impact Area

Based on the remediation strategy for the SBT Site, Sydney Metro issued an instruction to CPBG to excavate and remove all fill materials from the Medium Impact Area. At the time of preparing the RAP fill materials had been removed from the SBT Site. Fill materials which remained on the SBT Site that required remediation included:

- Stockpiled material in Asbestos Remediation Area 1
- Topsoil/fill materials in Asbestos Remediation Area 2.

These remediation areas are shown in Figure 7A and 7B in Appendix 1.

When removing the stockpiles in **Asbestos Remediation Area 1** CPBG was to scrape and remove 0.1 m of the underlying natural material to confirm that the natural ground which underlies the stockpile and has been in direct contact with the stockpiled material has been removed.

Fill/disturbed natural ground from **Asbestos Remediation Area 2** was to be stripped to a typical depth of 0.2 m bgs or a minimum of 0.1 m below the base of fill materials and disposed off-site in accordance with NSW waste guidelines.

Following removal of fill/disturbed natural materials in Asbestos Remediation Area 1 and Asbestos Remediation Area 2 (including stockpiled materials), the area where fill materials was removed was to be inspected to confirm that fill materials and disturbed natural materials have been removed and exposed ground is undisturbed natural ground.

Following the removal of stockpiled soil materials from Asbestos Remediation Area 1 validation samples were to be collected from under disturbed natural ground and assessed for PFAS.

### 10.4.2. Natural Materials with PFAS

Natural materials containing PFAS which require remediation are summarised in Section 8.2.4 and shown in Figure 7A, Appendix 1 and include:

- PFAS Remediation Area 1A
- PFAS Remediation Area 1B
- PFAS Remediation Area 2
- PFAS Remediation Area 3.

These materials were to be excavated and disposed of off-site to an appropriately licenced waste management facility.

Existing data available at the time of preparing the RAP was considered to be sufficient for validation purposes in the following PFAS Remediation Areas:



- PFAS Remediation Area 1A
- PFAS Remediation Area 1B
- PFAS Remediation Area 2

Accordingly no further validation sampling was considered to be required for these areas.

Validation sampling for PFAS in soils was required following removal of soil materials in PFAS Remediation Area 3.



## 11. Remediation and Validation Works

### 11.1. Key Parties Involved in Remediation and Validation

The following companies were involved in the remediation and validation works at the SBT Site.

Table 9: Key Parties involved in Remediation and Validation

Party	Role
CPBG	Principal Contractor / Developer. CPBG were responsible for implementing the RAP.
Sydney Metro	Delivery of the SBT Project Review of SAQP, DSI, RAP and Validation Report in regard to compliance with the Deed and regulatory approvals Stakeholder engagement.
Airsafe Laboratories Pty Ltd	Occupational Hygienist / Licenced Asbestos Assessor engaged by CPBG: Asbestos fibre air monitoring and clearance certificates
Auswide Operations Pty Ltd Trading as Mann Group NSW	Earthworks Subcontractor engaged by CPBG SafeWork NSW Class A Licenced Asbestos Removal Contractor (SafeWork Licence AD212715 <sup>8</sup> ) / Supervisor
Cono Services Pty Ltd	Site Establishment Earthworks Subcontractor engaged by CPBG
Specialist Tunnel Excavation Group Pty Ltd	Bulk Excavations of Station Box engaged by CPBG
Attcall Haulage Pty Ltd Bakers Landscape Supplies Pty Ltd	Spoil Haulage Contractors engaged by CPBG
JBS&G, Andrew Lau, Site Auditor	Review of SAQP, DSI, RAP and Validation Report prepared by TTMP
TTMP	TTMP carried out the following scope: <ul style="list-style-type: none"> <li>Preparation of material classification assessments.</li> <li>Periodic inspections during construction to confirm that fill materials had been removed.</li> <li>Collection of validation samples required under the RAP.</li> <li>Site visit at the completion of remedial works.</li> <li>Review of documentation provided by CPBG relating to remedial works carried out.</li> <li>Preparation of this Validation Report.</li> </ul>

<sup>8</sup> <https://verify.licence.nsw.gov.au/details/Asbestos%20Removal%20Licence/30728>, accessed 19 July 2023.



## 11.2. Materials Requiring Removal

### 11.2.1. Fill Materials in Remediation Area

#### 11.2.1.1. Removal of Fill Materials

Fill materials in the Medium Impact Area were excavated and removed by CPBG over three main stages which are summarised as follows:

#### Stage 1: fill materials within CPBG construction disturbance footprint

Stage 1 involved the excavation of fill materials within CPBG construction disturbance footprint. These areas are shown in the polygons in yellow in Figure D. Material excavated in Stage 1 was disposed by CPBG off site at an appropriately licenced waste management facility (refer to Section 11.6).

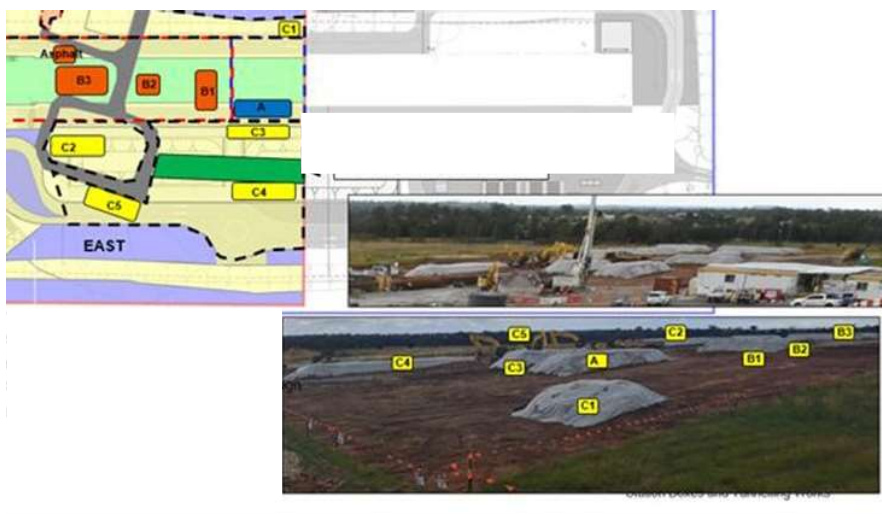


Figure D: Stage 1 Excavation of Fill Materials (areas shown with yellow polygons)

#### Stage 2: fill materials within the Medium Impact Area and outside the CPBG construction disturbance footprint.

Stage 2 involved the excavation of fill materials within the Medium Impact Area and outside of the CPBG construction disturbance footprint. Materials which have been excavated in Stage 2 are shown as the labelled polygons 1 to 7 in Figure E. These materials were stockpiled in ACM Remediation Area 1 shown in Figure 7A, Appendix 1.





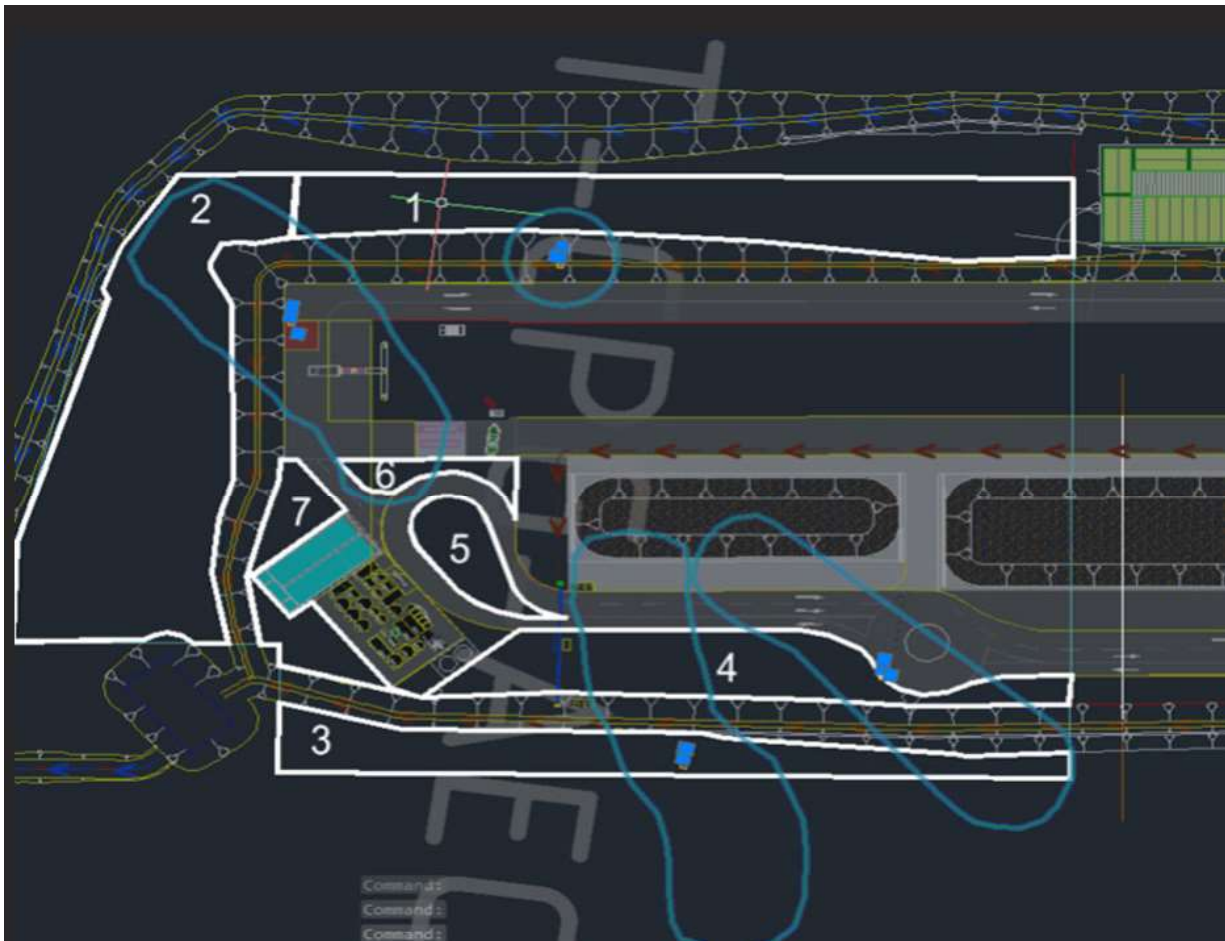


Figure E: Stage 2 Excavation of Fill Materials (areas within the numbered polygons 1 to 7)

### Stage 3: removal of fill materials from ACM Remediation Area 1 and ACM Remediation Area 2

Stage 3 involved the excavation of fill materials in the stockpile at ACM Remediation Area 1, and ACM Remediation Area 2 by CPBG and the disposal of these materials at an appropriately licenced waste management facility (refer to Section 11.6).

A plan showing ground surface elevation following the removal of fill and topsoil materials in the Remediation Area is provided in Appendix 3.1. Appendix 3.1 includes survey plan showing the lateral extent of areas excavated and coordinates. CPBG advised that the minimum excavation depth undertaken over the SBT Site to remove topsoil where fill material was not present was approximately 0.3 m.

TTMP also note that the amount of topsoil/fill material removed from the Remediation Area is generally consistent with an estimate prepared by TTMP based on borehole and pre-construction ground survey data (refer to Table 13, Section 11.6.4).

#### 11.2.1.2. Validation of the Removal of Fill Materials

During SBT Works, inspections were undertaken by TTMP to assess whether fill materials and/or disturbed natural ground (topsoil) had been stripped to a depth that exposed un-disturbed natural





ground. The inspections were undertaken by an experienced environmental consultant, and are summarised in Table 10. Photographic records of the inspections are provided in Appendix 7.

The inspections confirmed that fill materials and/or disturbed natural ground in the Remediation Area had been removed to undisturbed natural ground, and visible ACM was not observed on the exposed surface of natural soils.

Table 10: Site Inspections to Confirm the Removal of Fill Materials

Date of Inspection by TTMP	Summary of Inspection
20/12/22	<b>General inspections during earthworks in Medium Impact Area</b>
01/02/23	Records from these inspections are provided in Appendix 7.1
16/02/23	The inspections confirmed that fill materials had been stripped to undisturbed natural ground in the Medium Impact Area in the areas inspected. The inspections were undertaken as earthworks progressed. The inspections concluded that fill materials had been removed in the Medium Impact Area in the areas inspected.
24/02/23	
11/07/23	<b>ACM Remediation Area 1</b>
14/07/23	Records from this inspection are provided in Appendix 7.2  The inspections confirmed that the stockpile had been removed and soil beneath the stockpile had been removed to a depth that exposed undisturbed natural ground. The inspections were undertaken over 2-days. The first inspection on the 11/7/23 inspected the eastern half of the stockpile footprint, and the second inspection on the 14/7/23 inspected the western half of the stockpile footprint. The inspection concluded that the stockpile had been removed to undisturbed natural ground. No visible ACM was observed on natural ground in the areas inspected.
14/07/23	<b>ACM Remediation Area 2 and PFAS Remediation Area 3</b>  Photographic records from the inspections are provided in Appendix 7.2 and Appendix 7.3 (note PFAS Remediation Area 3 is included in these areas).  The inspection confirmed that fill materials had been removed in the areas inspected. No visible ACM was observed on natural ground in the areas inspected.
14/7/23	<b>General inspection of Remediation Area and SBT Site</b>  Records from this inspection are provided in Appendix 7.4  The inspection was undertaken to check that fill materials had been stripped to undisturbed natural ground over the Remediation Area. General observations were also made in regard to site conditions (refer to Section 11.3). The inspections confirmed that fill materials had been removed in the Remediation Area and no stockpiles of fill materials were present. No visible ACM was observed on natural ground in the areas inspected.

Note asbestos clearance certificates including soil sampling was also completed by the Licenced Asbestos Assessor (LAA) following removal of topsoil and fill materials from the Remediation Area (refer to Section 11.10.3 for further information).



### 11.2.1.3. Validation of Natural Soils Beneath ACM Remediation Area 1

Samples of undisturbed natural ground were not collected for asbestos analysis given the observations recorded (refer Table 10 above). However, soil samples were collected for analysis of asbestos from the ACM Remediation Area 1 post removal of the stockpile as part of the clearance certificates issued by the LAA<sup>9</sup>. None of the 23 samples collected from the footprint of ACM Remediation Area 1 reported positive detection for asbestos (refer to Section 11.10.3 for further information on the asbestos sampling).

Validation samples were collected from undisturbed natural ground materials in the footprint of ACM Remediation Area 1 on the 11/7/23 and the 14/7/23, and analysed for PFAS only. Validation samples were set out at approximate 10 m grid spacings (i.e. 1 sample per 100 m<sup>2</sup>) and collected in accordance with the method described in Section 12.3.1 and 12.3.4 of the RAP.

The validation sample locations are shown in Figure 4F, Appendix 1. Laboratory certificates of analysis, sample receipt notices and chain of custody documents are provided in Appendix 9.

An assessment of the data quality and is provided in Appendix 5 and Appendix 10. In summary the data was considered directly usable for validation.

Tabulated data compared to the commercial land use remediation criteria<sup>10</sup> is provided in Appendix 8 (Table 8.1). In summary all validation sample results in ACM Remediation Area 1 reported concentrations of PFAS below the commercial land use remediation criteria.

## 11.2.2. Materials with PFAS

### 11.2.2.1. Removal of materials from PFAS Remediation Areas

The methodology undertaken by CPBG to remove materials from the PFAS Remediation Areas comprised the following:

- survey to set out the boundary of PFAS Remediation Area 1A, 1B, 2 and 3.
- excavation of soil material within the PFAS Remediation Areas to achieve the required depth of excavation in Table 7 (refer to Section 10.4.2). A photograph showing the removal of material from PFAS Remediation Area 1A and 1B is provided on page 41.
- survey of excavation to confirm the target depth of excavation had been achieved. Survey data showing the lateral extent and surveyed elevation of excavations undertaken in the PFAS Remediation Areas is provided in Appendix 3.2.
- collection of validation samples from PFAS Area 3 (refer to Section 11.2.2.2)
- backfilling of excavations with natural soil material cut from the Medium Impact Area (outside of the PFAS Impact Areas) (refer to Section 11.7 for further information).
- off-site disposal of excavated material to a licenced waste management facility (refer to Section 11.6).

<sup>9</sup> Airsafe (2023) 215 Badgerys Creek Road, Bringelly – Inspection Report, 10 July 2023 which included the analysis of 8 samples from ACM Remediation Area 1 and Airsafe (2023) 215 Badgerys Creek Road, Bringelly – Inspection Report, 18 July 2023 which included the analysis of 15 samples from ACM Remediation Area 1. A sampling plan shown the sample locations is not provided within these reports. CPBG has advised that these samples were appropriately spaced across ACM Remediation Area 1.

<sup>10</sup> ACM Remediation Area 1 is located in a commercial land use area.



### 11.2.2.2. Validation of materials from PFAS Remediation Area

Validation samples were collected from undisturbed natural ground materials in the footprint of PFAS Remediation Area 3 on the 26/5/23 and the 14/7/23.

Validation samples were set out and collected in accordance with the method described in Section 12.3.2 and 12.3.4 of the RAP including:

- two samples from the floor of the excavation (PFAS-RA3\_V01 and PFAS-RA\_V02). The area of PFAS Remediation Area 3 is 165 m<sup>2</sup> and the requirement of Section 12.3.2 of the RAP was to collect 1 sample per 100 m<sup>2</sup> of the floor of the excavation. Accordingly two samples were collected from the floor of the excavation. Samples were collected from the centre of the north-south axis of the excavation and noting that samples would also be collected from the walls of the excavation (i.e. around the perimeter of the excavation) to provide representative spatial coverage over the excavation area.
- four samples from each of the walls of the excavation (PFAS-RA\_V03 to PFAS-RA\_V06). The area of the longest wall of the PFAS Remediation Area 3 is approximately 8.7 m<sup>2</sup> and the requirement of Section 12.3.2 of the RAP was to collect one sample per 20 m<sup>2</sup> of excavation walls with a minimum sample of one sample per excavation wall. Accordingly four samples were collected (one from each wall).
- four additional samples required by CPBG where buried services were encountered including PRA-01 to PRA-04.

The validation sample locations are shown in Figure 4G, Appendix 1, and Appendix 3.2 Figure C. Laboratory certificates of analysis, sample receipt notices and chain of custody documents are provided in Appendix 9.

An assessment of the data quality is provided in Appendix 5 and Appendix 10. In summary the data was considered directly usable for validation.

Tabulated data compared to the open space land use remediation criteria<sup>11</sup> is provided in Appendix 8 (Appendix 8.2). In summary all validation sample results in PFAS Remediation Area 3 reported concentrations of PFAS analytes below the open space land use remediation criteria.

<sup>11</sup> PFAS Remediation Area 3 is located in an open space land use area.





Excavation of PFAS Remediation Area 1A and 1B 1 June 2023





### 11.3. Site Description (Post-Remediation)

A site inspection was carried out by a suitably qualified and experienced Environmental Consultant on 14/07/23 whilst in the company of a CPBG Engineer who provided anecdotal information regarding earthworks activity within the SBT Site. Photographs are presented in Appendix 7.5. The following key observations were made:

- Station Box excavation:
  - The excavation of the Station Box was in progress at the time of inspection. A long reach excavator was being used to recover excavated material from the Station Box and load into Moxy tippers. The material was then being transferred to a stockpile adjacent to the east of the Station Box.
- Stockpiles:
  - Stockpiled Station Box spoil was observed to the east of the Station Box however closer inspection was not feasible as access to this operational area was constrained. It was reported that the larger stockpile comprised general Station Box Spoil and an adjacent smaller segregated stockpile comprised Stub Tunnel Spoil.
  - One large stockpile of medium impact material was located at the south eastern portion of the SBT Site.
  - One relatively small stockpile was located at the south-western corner of the SBT Site. This material was reportedly topsoil/seedbank material from Low Impact Areas that was to be used for future site restoration.
  - Several relatively small stockpiles were located at the southern extent of the ACM Remediation Area 1. This material was reportedly material that was generated during the excavation of the swale drain located at the southern end of the SBT Site (note this is a Low Impact Area).
  - A relatively small, segregated stockpile of concrete waste (including rubble and washout waste) was located in the mid-western portion of the SBT Site (adjacent to the southern side of the SBT Site office area).
  - Records (i.e., AutoCAD Plans) of stockpiled material and soil movements at the SBT Site were made available to the TTMP Environmental Scientist during the inspection. Records appeared to be well kept and reflected what was observed on the SBT Site.
  - No stockpiles of remaining fill material or material of unknown origin were apparent.
- General site conditions:
  - Construction of the Station Box was in progress with excavation and shotcrete activities were being undertaken.
  - A water cannon was being used to spray water across the Station Box to reduce dust emissions.
  - Several laydown areas were being utilised however the SBT Site appeared be well organised with all plant/machinery, tools and equipment being stored within designated areas.
  - Chemical and fuel storage appeared to be minimal on site and where present appeared to be well managed, with portable bunds in use under bulk containers.
  - No evidence of uncontrolled waste was apparent.
  - No evidence of the presence of suspected ACM was observed.
  - No evidence of spills or uncontrolled release of contaminants was apparent.
  - No evidence in-situ fill materials were observed on the SBT Site, and the in-situ ground materials observed was un-disturbed natural ground.



## 11.4. Soil Materials Post-Remediation

Appendix 8.3 (Commercial Areas) and Appendix 8.4 (Open Space Areas) provides tabulation of soil sample data for soil materials remaining on-site post remediation. This table excludes data associated with the following materials:

- fill materials and soil materials less than 0.3 m bgs which were excavated and removed from the SBT Site.
- materials removed for remediation described in Section 11.2.
- materials removed from the bulk excavation of the station box.

## 11.5. Unexpected Finds

With the exception of ACM observed during drilling by TTMP for the DSI, CPBG did not report other unexpected finds or incidents during construction at the SBT Site. The table below summarises how CPBG managed the unexpected finds. The CPBG form which describes the unexpected find is included in Appendix 14.

Table 11: Unexpected Finds

ID	Unexpected Find	UFP Management
T80080.W3.ENV. 280721.00305716	ACM during Tetra Tech drilling	TTMP drilling crews discovered suspected ACM during DSI drilling works. A description of the ACM observed by TTMP during the DSI is provided in the DSI report and was associated with fill materials in the Medium Impact Area. Fill materials from the Medium Impact Area were removed and disposed off-site as part of the remediation undertaken on the SBT Site (refer to Section 11.2).

## 11.6. Bulk Excavation and Waste Disposal

### 11.6.1. Survey

Appendix 3.1 includes a plan showing ground surface elevation<sup>12</sup> following the removal of fill and topsoil materials in the Remediation Area, and the surveyed lateral extent of remediation. CPBG advised that the minimum strip depth undertaken over the SBT Site to remove topsoil where fill material was not present was approximately 0.3 m.

<sup>12</sup> Appendix 3.1 provides a Digital Elevation Model (DEM) raster image of excavation depths based on point survey data provided by CPBG in the file 'AEC POST STRIP SURFACE R02.dwg (strip heights).dwg'. The DEM was created using the 3D Analyst tool in ArcGIS Prop from the survey data.





### 11.6.2. Visual Inspections

TTMP understands that CPBG carried out visual inspections of fill material during excavation. CPBG has advised that these were completed by Site Supervisors during bulk excavations and no unexpected finds were identified.



### 11.6.3. Material Classification Assessments

The following material classification reports were prepared by TTMP to assist remedial works, copies of which are provided in **Appendix 11**.

Table 12: Summary of Material Classification Reports

No.	Report Reference and Title.	Summary of Material Classification Assessment Findings	Comment
1	SMWASBT-CPG-SWD-SW000-GE-RPT-040533 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Low Impact Area, Rev A01, 7 October 2023	This report assessed surficial soil materials in the station box in the Low Impact Area as General Solid (GSW) Waste Non-Putrescible from ground surface to 0.3 m bgs.  Natural materials deeper than 0.3 m within the station box were assessed as Virgin Excavated Natural Materials (VENM) with the exception of materials containing PFAS which were assessed as GSW Non-Putrescible. The positive detections of PFAS were considered as potential false positives and the report provided recommendations on how these areas could be further assessed as ENM or VENM. These assessments were undertaken under No. 4 to 7 in this table.	Topsoil materials to 0.3 m from Low Impact Areas were retained on-site for re-use (refer to Section 11.7).  Materials deeper than 0.3 m bgs were not removed from the SBT Site under this Material Classification Assessment based on subsequent assessments undertaken to assess materials as ENM or VENM.
2	SMWASBT-CPG-SWD-SW000-GE-RPT-040535 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Remediation Area – Materials less than 4 m below ground surface, Rev A04, 28 June 2023	This report assessed soil materials in the Medium Impact Area (Note 1) as follows: a) Area G: surface to 1 m bgs as Restricted Soil Waste Non-Putrescible which must be managed as Special Waste (Asbestos) b) Balance of Remediation Area / Medium Impact Area comprising surficial soils (<0.3 m bgs), fill or disturbed natural materials as GSW Non-Putrescible which must be managed as Special Waste (Asbestos Waste) c) Balance of Remediation Area (excluding the station box) undisturbed natural materials >0.3 m bgs to ≤ 4 m bgs as General Solid Waste (non-putrescible).	Refer to Note 2.  Materials assessed under b) were disposed under Item No. 10 to 12 in Table 14 (refer to Section 11.6.4)  Materials assessed under c) were disposed under Item No. 15 to 18 in Table 14 (refer to Section 11.6.4)
3	SMWASBT-CPG-SWD-SW000-GE-RPT-040536 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Medium Impact Area – Materials greater than 1 m below ground surface in the Station Box, Rev A01, 9 January 2023	This report assessed undisturbed natural soil materials in the station box in the Medium Impact Area as VENM with the exception of materials containing PFAS which were assessed as GSW Non-Putrescible. The positive detections of PFAS were considered as potential false positives and the report provided recommendations on how these areas could be further assessed as ENM or VENM. These assessments were undertaken and presented under reports listed as No. 4 to 7 in this table.	Materials were not removed from the SBT Site under this Material Classification Assessment based on subsequent assessments undertaken to assess materials as ENM or VENM.
4	SMWASBT-CPG-SWD-SW000-GE-RPT-040537 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Medium Impact Area – ENM Assessment of existing surface materials to 1 m below ground surface, Rev A01, 14 January 2023	This report assessed a portion of the undisturbed natural soil materials in the station box in the Medium Impact Area to 1 m bgs as ENM.	Materials were not removed from the SBT Site under this Material Classification Assessment. CPBG used report reference SMWASBT-CPG-SWD-SW000-GE-RPT-040541 which incorporated data from this report and provided an assessment to 3 m bgs.
5	SMWASBT-CPG-SWD-SW000-GE-RPT-040540 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Low Impact Area – ENM Assessment of existing natural materials to 3 m below ground surface, Rev A02, 27 February 2023.	This report assessed a portion of the undisturbed natural soil materials in the station box in the Low Impact Area to 3 m bgs as ENM.	Materials assessed were disposed under Item No. 22 in Table 14 (refer to Section 11.6.4)
6	SMWASBT-CPG-SWD-SW000-GE-RPT-040541 Material Classification Assessment: Aerotropolis Bulk Excavation of Station Box in Medium Impact Area – ENM Assessment of existing natural materials to 3 m below ground surface	This report assessed a portion of the undisturbed natural soil materials in the station box in the Medium Impact Area from 1 to 3 m bgs as ENM.	Materials assessed were disposed under Item No. 22 and 26 in Table 14 (refer to Section 11.6.4)



No.	Report Reference and Title.	Summary of Material Classification Assessment Findings	Comment
7	SMWSASBT-CPG-SWD-SW000-GE-RPT-040551 Material Classification Assessment: Aerotropolis Station Box Natural Materials 3 to 20 m bgs	This report assessed a portion of the undisturbed natural soil materials in the station box from 3 to 20 m bgs as VENM. Positive detection of PFAS reported in previous investigations from Cardno were assessed to be false positives. In making this assessment it was noted in the station box PFAS non-detects had been reported in materials deeper than 3 m bgs from a total of 507 samples from 38 locations.	Materials assessed were disposed under Item No. 25 in Table 14 (refer to Section 11.6.4) Materials assessed under b) were disposed under Item No. 10 to 12 in Table 14 (refer to Section 11.6.4)

Note 1: SMWSASBT-CPG-SWD-SW000-GE-RPT-040535 included a number of revisions as follows:

- Rev A01: materials were assessed as per the categories described in No. 2 above however the depth of materials assessed was to 1 m bgs in the Medium Impact Area
- Rev A02: materials were assessed as per the categories described in No. 2 above however the depth of materials assessed was to 4 m bgs in the Medium Impact Area
- Rev A03: materials requiring excavation from PFAS Remediation Area 3 and ACM Remediation Area 3 were included in this revision.
- Rev A04: amended document to address comment from Sydney Metro; the material classification did not change.

Note 2: Materials from Area G were disposed as GSW Non-putrescible Special Waste (Asbestos Waste) to the Bingo Eastern Creek Ecology Park waste facility. This facility is licenced (EPL Licence No. 13426) to receive GSW Non-putrescible and Asbestos waste however it is not licenced to receive Restricted Solid Waste (RSW). The material was assessed provisionally as RSW based on lead concentrations which exceeded CT1 thresholds and in the absence of soil leachate (TCLP) data. CPBG has advised that 177.36 tonnes of material were disposed from Area G. TTMP note that the assessment of material from Area G that was classified as RSW was based on lead levels reported in a previous investigation undertaken by GHD<sup>13</sup> in 2022 which reported lead in five samples with concentrations between 108 mg/kg and 312 mg/kg and in the absence of TCLP data for these samples. Similar concentrations of lead were not reported in investigation locations undertaken by TTMP in this area which reported a maximum concentration of 32 mg/kg.

As part of the preparation of this Validation Report TTMP has undertaken a retrospective assessment of the material disposed to the Bingo Eastern Creek Ecological Park waste facility as 'GSW Non-putrescible which must be managed as Special Waste (Asbestos Waste)' and noting that no TCLP data is available for the material from Area G, and no TCLP was undertaken for lead in other samples on the basis that CT1 thresholds were not exceeded. TTMP consider that the material disposed to the Bingo Eastern Creek Ecological Park can be considered Asbestos Waste for the following reasons:

- Approximately 17,000 tonnes of material of fill/topsoil material from the Remediation Area was disposed to the Bingo Eastern Creek Ecological Park waste facility as 'GSW Non-putrescible Special Waste (Asbestos Waste)'. The material from Area G represents approximately 1% of the material sent to this facility as Asbestos Waste.
- The UCL95 for lead (calculated using ProUCL, refer to Appendix 15<sup>14</sup>) for soil samples from ground surface to 0.2 m bgs in the Medium Impact Area is 34.4 mg/kg. The standard deviation of this sample population is 30.6 mg/kg, which is less than 50% of the CT1 threshold. This UCL95 is considered to be representative of the materials disposed to this facility as 'Asbestos Waste'. For the calculated maximum TCLP leach concentration is 1.72 mg/l assuming all lead in soil is leached. This theoretical maximum leachate concentration and the maximum lead concentration in soil is below the SCC1/TCLP1 thresholds for GSW.
- Concentrations of lead reported by TTMP in nearby investigation locations were below the CT1 threshold.

## 11.6.4. Waste Tracking and Disposal Fill/Soil/Rock Materials

TTMP was engaged to prepare Material Assessment Reports and undertake supplementary sampling for material classification purposes during construction. The Material Assessment Reports prepared by TTMP are summarised in Section 11.6.3.

TTMP was not engaged for the day-to-day tracking of soil waste materials disposed offsite. As part of this validation assessment, TTMP was provided with material tracking spreadsheet (Appendix 12) and waste disposal dockets compiled by CPBG (Appendix 13). TTMP undertook a review of the information provided by CPBG which is summarised in Table 13.

Based on the checks undertaken by TTMP the excavated materials were disposed in general accordance with the material classification assessments prepared by TTMP. TTMP has noted data entry errors in the material tracking registers. TTMP consider these to be minor and have not affected the overall conclusions drawn with regard to the management of spoil from the SBT Site.

<sup>13</sup> GHD (2022) Sydney Metro Western Sydney Airport - Aerotropolis Station Box Compound Assessment

<sup>14</sup> For sample results with non-detectable concentration a concentration at the limit or reporting was assumed.



Table 13: CPBG Material Tracking Register from Appendix 12

CPBG Item Ref No.	CPBG Tracking Sheet Ref No.	Material and Waste Classification	Material Assessment Report Reference	Total Quantity Disposed (tonnes)	Waste Receiver	TTMP Review of Material Tracking Register and Dockets
10 to 12	4 and 5	Material: topsoil and fill materials from Medium Impact Area / Remediation Area Waste Classification used by CPBG: Special Waste Asbestos	SMWSASBT-CPG-SWD-SW000-GE-RPT-040635	32,410.81	Bingo Eastern Creek Landfill, 1 Kangaroo Avenue, Eastern Creek, NSW 2766; EPL 13426.  Erskine Park Landfill, 4 Quarry Road, Erskine Park, NSW, 2759; EPL 4865	<p><b>Recipient licenced to receive waste:</b> Yes (refer to Table 12 for further information).</p> <p><b>Amount of materials disposed:</b> The material assessment report did not include a quantity of material which had been assessed under this item. This was due to a number of factors including uncertainty in the quantity of topsoil/fill materials present, and the directive from Sydney Metro to remove all topsoil/fill materials from the Remediation Area which came after the Material Assessment Report had been prepared (prior to this directive of the majority of materials disposed under this item were to be retained on-site).</p> <p>The materials disposed comprised topsoil/fill material from the Remediation Area. Based on the mass of materials disposed, an assumed bulk density of 1.7 tonnes/m<sup>3</sup> the estimated bank volume of material disposed is approximately 19,000 m<sup>3</sup> which generally correlates with TTMP estimate<sup>15</sup> of the quantity of topsoil/fill material requiring disposal of 17,000 m<sup>3</sup> which was based on ground model developed in ArcGIS using reported fill depths in intrusive borehole/test pit data and pre-construction ground surface levels.</p> <p>The area of the Remediation Area is approximately 36 ha. If 19,000 m<sup>3</sup> was removed over this area the average depth of topsoil/fill material which was cut was approximately 0.53 m.</p> <p><b>Waste Dockets:</b> TTMP completed a check of the CPBG Tracking Sheet 4 and Tracking Sheet 5 against the dockets provided for approximately 25% of the records. The check noted the following:</p> <ul style="list-style-type: none"> <li>The waste receiver matched the receiver in the Summary Tracking Sheet.</li> <li>The material description (Special Waste Asbestos) in the dockets matched the description in the Material Tracking Register / Material Assessment Report</li> <li>Delivery dockets were provided for the majority of entries. Where a delivery docket record was not provided a waste transporter docket had been included which stated a waste recipient which matched the expected waste receiver.</li> <li>The quantities of materials in the dockets matched the register for the majority of entries. A number of Waste Receive Docket Reference Numbers (Tip Docket Number) were reported incorrectly in the Tracking Sheet however other information entered (weight, material classification, etc.) were correct.</li> </ul>

<sup>15</sup> The estimate was included in TTMP (2023) Technical Memorandum: Aerotropolis Remedial Action Plan Source Removal – Draft for Discussion Purposes, SMWSASBT-CPG-SWD-SW001-GE-MEM-040555, Rev A01



CPBG Item Ref No.	CPBG Tracking Sheet Ref No.	Material and Waste Classification	Material Assessment Report Reference	Total Quantity Disposed (tonnes)	Waste Receiver	TTMP Review of Material Tracking Register and Dockets
15 to 18	7	Material: PFAS contaminated natural soil materials. Waste Classification used by CPBG: GSW Non-Putrescible	SMWSASBT-CPG-SWD-SW000-GE-RPT-040535	1424.49	Elizabeth Drive Landfill Facility, 1725 Elizabeth Drive, Kemps Creek NSW 2178, EPL 4068	<p><b>Recipient licenced to receive waste:</b> Yes</p> <p><b>Amount of materials disposed:</b> The material assessment report did not include a quantity of material which had been assessed under this item. This was due the directive from Sydney Metro to remove PFAS impacted soils which exceeded the Remediation Criteria from the Remediation Area after the Material Assessment Report had been prepared (prior to this directive these materials were to be retained on-site).</p> <p>The materials disposed comprised natural material from PFAS Remediation Area 1A/1B, 2 and 3. Based on the estimated bank volume of material requiring disposal of 805 m<sup>3</sup> and an assumed bulk density of 1.8tonnes/m<sup>3</sup>, the mass of material requiring disposal was approximately 1450 tonnes. Records show that CPBG disposed 1424 tonnes which generally correlates with TTMP estimate.</p> <p><b>Waste Dockets:</b> TTMP completed a check of the CPBG Tracking Sheet 7 against the dockets provided for approximately 35% of the records. The check noted the following:</p> <ul style="list-style-type: none"> <li>The waste receiver matched the receiver in the Summary Tracking Sheet.</li> <li>The material description (Contaminated Soil / General Waste) in the dockets matched the description in the Material Tracking Register / Material Assessment Report</li> <li>Delivery dockets were provided for the entries in the register.</li> <li>The quantities of materials in the dockets matched the entries in the register.</li> </ul>
22, 25 and 26	6	Material: Bringelly Shale Material Classification used by CPBG: ENM	SMWSASBT-CPG-SWD-SW000-GE-RPT-040540 SMWSASBT-CPG-SWD-SW000-GE-RPT-040541	57,586.28	Nepean Business Park M12 Western Section	<p><b>Recipient licenced to receive ENM:</b> Yes</p> <p><b>Amount of materials disposed:</b> The material assessment report noted that the bulk excavation of the station box required the excavation of up to 170,000 m<sup>3</sup> of spoil as a bank volume. Under Item Ref. No. 22, 25 (refer to next row) and 26 CPBG has disposed of approximately 201,294.58 tonnes as ENM or VENM. Based on an assumed bulk density of 2.56 for the Bringelly Shale (Note 2) this equates to an approximate volume of 79,000 m<sup>3</sup> (refer to Note 1 at end of table).</p> <p><b>Waste Dockets:</b> TTMP completed a check of the CPBG Tracking Sheet 6 against the dockets provided for approximately 5% of the 5,550 records (ENM or VENM). The check noted the following:</p> <ul style="list-style-type: none"> <li>The receiver matched the receiver in the Summary Tracking Sheet for the Nepean Business Park. Receiver dockets for M12 Western Section were not included in the document register. CPBG has advised that the M12 does not have a weighbridge and material tracking for the M12 is being undertaken through two measurements including the weight of the material loaded onto each truck via a scale on the excavator bucket, and scale on the truck which records the weight of the material which has been loaded onto the truck.</li> <li>The material description (VENM or ENM) in the transport or receiver docket generally matched the description in the Material Tracking Register / Material Assessment Report</li> <li>Delivery dockets were provided for the entries in the register.</li> <li>The quantities of materials in the dockets generally matched the entries in the register some minor data entries were noted.</li> </ul>



CPBG Item Ref No.	CPBG Tracking Sheet Ref No.	Material and Waste Classification	Material Assessment Report Reference	Total Quantity Disposed (tonnes)	Waste Receiver	TTMP Review of Material Tracking Register and Dockets
25	6	Material: Bringelly Shale Material Classification used by CPBG: VENM	SMVSASBT-CPG-SWD-SW000-GE-RPT-040551	143,708.30	M12 Western Section	<p><b>Recipient licenced to receive VENM:</b> Yes</p> <p><b>Amount of materials disposed:</b> The material assessment report noted that the bulk excavation of the station box required the excavation of up to 170,000 m<sup>3</sup> of spoil as a bank volume. Under Item Ref. No. 22, 25 (refer to row above) and 26 CPBG has disposed of approximately 201,294.58 tonnes as ENM or VENM. Based on an assumed bulk density of 2.56 for the Bringelly Shale (Note 2) this equates to an approximate volume of 78,650 m<sup>3</sup> (refer to Note 1 at end of table))</p> <p><b>Waste Dockets:</b> TTMP completed a check of the CPBG Tracking Sheet 6 against the dockets provided for approximately 5% of the 5,550 records (ENM or VENM). The check noted the following:</p> <ul style="list-style-type: none"> <li>The receiver matched the receiver in the Summary Tracking Sheet for the Nepean Business Park. Receiver dockets for M12 Western Section were not included in the document register. CPBG has advised that the M12 does not have a weighbridge and material tracking for the M12 is being undertaken through transport dockets.</li> <li>The material description (VENM or ENM) in the transport or receiver docket generally matched the description in the Material Tracking Register / Material Assessment Report</li> <li>Delivery dockets were provided for the entries in the register.</li> </ul> <p>The quantities of materials in the dockets generally matched the entries in the register however some minor data entries were noted.</p>

Note 1: CPBG advised 16/8/23 that the bulk excavation of the station box is in progress, and the difference in mass is likely attributed to the status of the material tracking register when provided which has entries against Tracking Sheet 6 to the 26 June 2023 and bulk density assumptions.

Note 2: Bulk density of the Bringelly Shale as per CPBG SBT Spoil Quantities.xlsx estimate 9 March 2021





### 11.6.5. Disposal of Concrete Materials

Concrete materials which have been excavated from the footings of the former RAAF receiving station are pre-classified as General Solid Waste Non-Putrescible and accordingly a material classification assessment of these materials is not required. Concrete materials were disposed off-site by CPBG as GSW Non-Putrescible (refer to Item 13 and Item 14 in Appendix 12).



Figure F: Concrete footings from for RAAF Receiving Station

### 11.7. Spoil Reuse

Based on the information provided by CPBG in Appendix 22 and clarification from CPBG during the preparation of the Validation Report, TTMP understanding the following regarding on-site spoil reuse:

- Topsoil from the Low Impact Area has been stockpiled for subsequent reuse as part of the SBT Project or SSTOM Works. The CPBG material tracking register included in Appendix 12 shows that CPBG has reused approximately 8,200 m<sup>3</sup> of site won topsoil material from the Low Impact Area.
- Material cut from the clean water swale drain shown in Appendix 23 in the Low Impact Area was used as fill material in the Low Impact Area.
- The CPBG material tracking register included in Appendix 12 shows that CPBG has reused approximately 9,500 m<sup>3</sup> of site won material from the Medium Impact Area. A portion of materials cut from the Medium Impact Area (not including materials requiring removal/disposal for remediation purposes in Section 11.2) were used as fill material for site levelling purposes in the Medium Impact Area where the proposed future land use is commercial as shown in Figure G. CPBG has advised that controls were put in place to prevent the placement of site won materials from the Medium Impact Area east of the Station Box where the future land use is open space and in Low Impact Areas. CPBG has advised that site won materials from the Medium Impact Area were only reused within the Medium Impact Area in areas where the future landuse is commercial.



- In Figure G imported materials were used as fill materials in Fill Zone 1 and Fill Zone 2 (refer to Section 11.8).
- Material from the bulk excavation of the Station Box which has been assessed as VENM (refer to Section 11.7.3) was used to fill ACM Remediation Area 1 (Zone 4 in Figure G) and PFAS Remediation Area 3 (Zone 3 in Figure G).

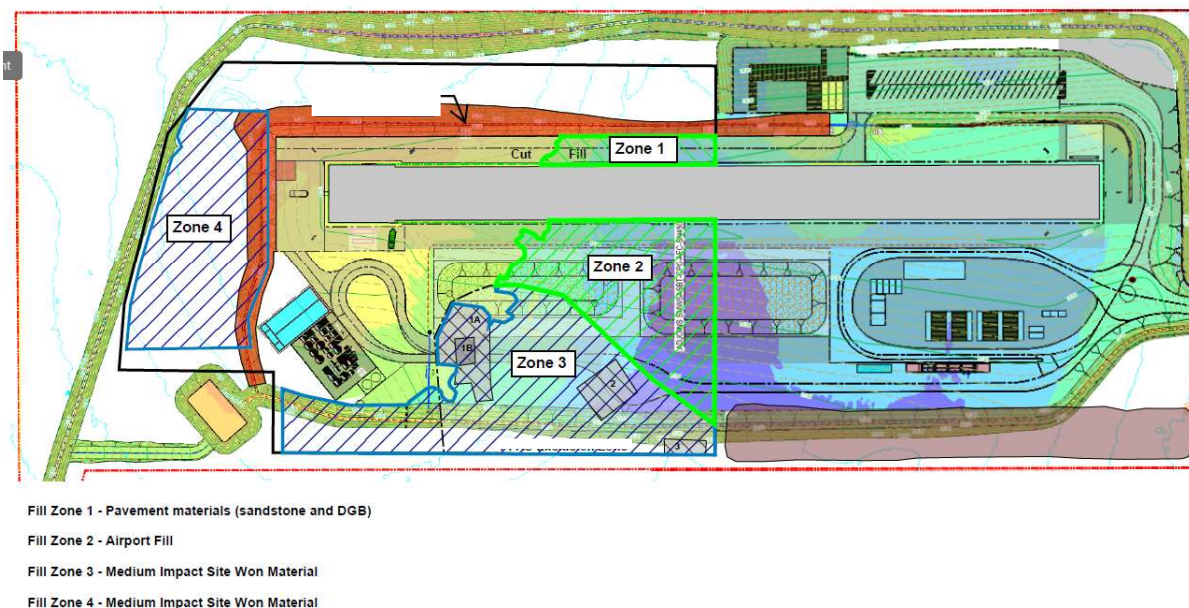


Figure G: Medium Impact Area Spoil Reuse Areas

In summary the on-site reuse of materials by CPBG is consistent with the requirement of the RAP noting that:

- Materials requiring removal/disposal for remediation purposes have not been reused on the SBT Site.
- Site won materials from the Medium Impact Area which did not require disposal for remediation purposes have been re-used within Commercial Land use portions of the Remediation Area and not within Low Impact Areas or Open Space portions of the Remediation Area.

## 11.8. Imported Products

TTMP was not engaged for the assessment of materials imported to site. As part of this validation assessment, TTMP was provided with material tracking spreadsheet (Appendix 12) and material import forms provided by CPBG (Appendix 16). CPBG completed visual inspection of materials imported which are provided in Appendix 16.

TTMP undertook a review of the information provided by CPBG which is summarised in Table 14. In summary based on the information reviewed by TTMP the imported materials are considered suitable for use at the SBT Site.



Table 14: Summary of Imported Products

CPBG Item Ref No. (Appx. 12)	CPBG Import Form No. / Appx. 16 Ref.	Material Attributes
1	0012 Appendix 16.1	<p><b>Material Type and Classification:</b> Soil / VENM</p> <p><b>Quantity Imported:</b> 24,727 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> CPBG JV Airport Business Park</p> <p><b>Comment and use at SBT Site:</b> CPBG imported material won from the SBT Project site Airport Business Park. The material assessment report provided by CPBG assessed the material as VENM. The description of the material in the import check undertaken by CPBG matched the description of the material.</p> <p>The imported material was used as general fill material for site levelling purposes within the Medium Impact Area in Fill Zone 1 and Fill Zone 2 (refer to Figure G).</p>
2	0057 Appendix 16.2	<p><b>Material Type and Classification:</b> DGB20 Concrete/Brick Aggregate assessed under <i>The Recovered Aggregate Order 2014</i></p> <p><b>Quantity Imported:</b> 5,665 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> ACE Civil</p> <p><b>Comment and use at SBT Site:</b> The imported material is an aggregate material comprising brick and concrete material. Based on the data provided foreign materials including plastic, bitumen and metal were also present however the concentration was below the criteria of The Recovered Aggregate Order. The description of the material in the inspection undertaken by CPBG matched the description of the material. Chemical data for the imported material did not exceed the Remediation Criteria in the RAP<sup>16</sup>.</p> <p>The material import form states the material was used beneath haul roads on the SBT Site.</p>
3	0067 Appendix 16.3	<p><b>Material Type and Classification:</b> DGB20 / VENM</p> <p><b>Quantity Imported:</b> ~ 4,300 m<sup>3</sup> (from material Import Form)</p> <p><b>Supplier:</b> Cleary Bros (EPL 299)</p> <p><b>Comment and use at SBT Site:</b> The imported material is quarried aggregate material. The NSW EPA has stated that 'commercially quarried material is not deemed a waste or requires a VENM certificate'. The description of the material in the inspection undertaken by CPBG matched the description of the material.</p> <p>The material import form and information from Appendix 22 shows this material was used beneath roads on the SBT Site.</p>

<sup>16</sup> The material import documentation provided for this material includes a report prepared by EIAUSTRALIA (12/1/23). The report includes a data table which has a sampling date of June 2016. The date referred to in this table is incorrect and the laboratory reports show the sampling date was the 22/12/2022.



CPBG Item Ref No. (Appx. 12)	CPBG Import Form No. / Appx. 16 Ref.	Material Attributes
4	0041 Appendix 16.4	<p><b>Material Type and Classification:</b> Crushed Sandstone / VENM</p> <p><b>Quantity Imported:</b> 5,389 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> ACE Civil - JWD Gosford</p> <p><b>Comment and use at SBT Site:</b> The imported material is quarried sandstone material. The material assessment report provided assessed the material as VENM. The description of the material in the inspection undertaken by CPBG matched the description of the material. Chemical data for the imported material did not exceed the Remediation Criteria in the RAP.</p> <p>CPBG has advised that the imported sandstone materials are located in haul roads and Fill Zone 2.</p>
6	0013 Appendix 16.5	<p><b>Material Type and Classification:</b> Crushed Sandstone / assessed under <i>The Rozelle Interchange Tunnel Spoil Order 2019</i>.</p> <p><b>Quantity Imported:</b> 1,985 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> Rozelle Interchange (Tunnel Spoil)</p> <p><b>Comment and use at SBT Site:</b> The imported material is tunnel bored sandstone material. The material assessment report provided assessed the material as compliant with <i>The Rozelle Interchange Tunnel Spoil Order 2019</i>. The description of the material in the import check undertaken by CPBG matched the description of the material. Chemical data for the imported material did not exceed the Remediation Criteria in the RAP.</p> <p>CPBG has advised that the imported sandstone materials were placed within haul roads and Fill Zone 2.</p>
7	0065 Appendix 16.6	<p><b>Material Type and Classification:</b> Crushed Sandstone / VENM</p> <p><b>Quantity Imported:</b> 2,316 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> Civiltrak, 878 Wisemens Ferry Road, South Maroota</p> <p><b>Comment and use at SBT Site:</b> The imported material is quarried aggregate material. The NSW EPA has stated that 'commercially quarried material is not deemed a waste or requires a VENM certificate'<sup>17</sup>. The description of the material in the import check undertaken by CPBG matched the description of the material.</p> <p>CPBG has advised that the imported sandstone materials were placed within haul roads and Fill Zone 2.</p>

<sup>17</sup> The Material Import Form includes a photo of the sandstone and the DA of the quarry site. The DA was issued in 2010 for the activity 'Extractive Industry - Sandstone Quarry'. As per Section 13.1.1 of the RAP, commercially quarried material which is extracted and sold from a quarry is exempt from a VENM certificate provided that the supplier can confirm the source of the material and the quarry has an EPL. As per Schedule 1(19) of the POEO Act, Extractive Activities are declared to be scheduled activities if they involve the extraction or processing of more than 30,000 tonnes extractive material per annum. The quarry where the material was sourced does not meet this threshold and as such, Development Consent issued by the Hills Shire Council to undertake quarrying activities has been provided.





CPBG Item Ref No. (Appx. 12)	CPBG Import Form No. / Appx. 16 Ref.	Material Attributes
8	0066  Appendix 16.7	<p><b>Material Type and Classification:</b> Crushed Sandstone / VENM</p> <p><b>Quantity Imported:</b> 2,706 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> JHCPB, Westconnex Stage 3B, EPL 21278</p> <p><b>Comment and use at SBT Site:</b> The imported material is quarried sandstone material. The material assessment report provided assessed the material as VENM. The description of the material in the inspection undertaken by CPBG matched the description of the material. Chemical data for the imported material did not exceed the Remediation Criteria in the RAP.</p> <p>CPBG has advised that the imported sandstone materials were placed within haul roads and Fill Zone 2.</p>
9	0040  Appendix 16.8	<p><b>Material Type and Classification:</b> Soil material assessed as suitable for reuse at Aerotropolis</p> <p><b>Quantity Imported:</b> 597 tonnes (from Material Tracking Register, Appx. 12)</p> <p><b>Supplier:</b> CPBG Bringelly Shaft Project Site, EPL 21672</p> <p><b>Comment and use at SBT Site:</b> The imported material is excavated material from the Bringelly Shaft. The material assessment report provided assessed the material as being suitable for importation to Aerotropolis based on an assessment against NEPM HIL-D Commercial/Industrial guidelines. The description of the material in the inspection undertaken by CPBG matched the description of the material. Condition O5.6 of EPL 21672 authorises the re-use and transportation of site won materials between SBT project sites.</p> <p>Chemical data for the imported material did not exceed the Remediation Criteria in the RAP.</p> <p>CPBG has advised that the imported materials were placed in Fill Zone 1 and Fill Zone 2.</p>

## 11.9. Construction Water Management

TTMP was not engaged for the management of construction water at the SBT Site. The following has been included in Appendix 17:

- EPL 21672
- Water monitoring register for Aerotropolis
- Plan showing monitoring and discharge points.

CPBG has advised that stormwater from disturbed areas was captured in a sediment basin. Groundwater inflow into the station box was collected in sumps and pumped to the surface for treatment within the Water Treatment Plant (WTP). The output from the WTP is pumped via a flexible pipe to the sediment basin.

CPBG has advised that construction water within the sediment basin is checked for the following parameters:

- a visual check to confirm the absence of oil/grease
- analysis of the construction water using a handheld meter (Horiba U-5000) for pH and turbidity.



Water from the sediment basin is reused on-site for dust suppression. At the time of writing CPBG has advised that there has been no controlled release of construction water from the SBT Site to land off of the SBT Site and/or to Thompsons Creek.





## 11.10. Asbestos Management

### 11.10.1. Management Plans

TTMP was provided with the management plans in relation to the management of asbestos-containing material, copies of which are provided in Appendix 18:

- CPBG. Asbestos Management Plan. Sydney Metro Western Sydney Airport Station Boxes and Tunnelling Works. Ref: SMWSASBT-CPG -1NL-NL000-SF-PLN-000024. Revision B. Dated 21 November 2022 (CPBG AMP).
- Mann Group NSW. Hazardous Material Removal Control Plan – Aerotropolis Station, 215 Badgerys Creek Rd, Bringelly NSW 2556 (ARCP).

The CPBG AMP was prepared to provide a procedure to manage risks associated with asbestos if identified during the Project. The AMP does not include an asbestos register but does include an Unexpected Asbestos (ACM) Find Procedure in the event that ACM was identified during the SBT Works.

The ARCP was “developed to assist Mann Group to meet the requirements associated with the asbestos removal Aerotropolis Station NSW, Medium Impact (Risk) Area with the scope of works as set out by Safework NSW and NSW WHS Act 2011 and its applicable regulations”.

CPBG confirmed that the excavation/removal of soil materials which potentially contain asbestos which required remediation was undertaken by Auswide Operations Pty Ltd Trading as Mann Group NSW. Mann Group is a SafeWork NSW Class A Licenced Asbestos Removal Contractor (SafeWork Licence AD212715<sup>18</sup>) / Supervisor. A copy of the licence is included in Appendix 19.

<sup>18</sup> <https://verify.licence.nsw.gov.au/details/Asbestos%20Removal%20Licence/30728>, accessed 16 August 2023.



### 11.10.2. Asbestos Fibre Air Monitoring Reports

Asbestos Fibre Air Monitoring Reports associated with excavation of soil materials with the potential for asbestos were provided to TTMP by CPBG. The reports are summarised and included Appendix 20. A review of the test reports indicates that:

- Monitoring was carried out by Airsafe on 45 occasions between 28 November 2022 and 6 July 2023.
- The number of fibres reported during air monitoring was equivalent to the detection limit (<0.01 fibres per millilitre of air (f/mL) and as such the results were:
  - Less than the control and action limits (0.01 f/ml and 0.02f/ml respectively) defined within the *SafeWork NSW How to Safely Remove Asbestos Code of Practice 2022*.
  - Considered to be equivalent to background concentrations.

### 11.10.3. Asbestos Clearance Certificates

Asbestos Clearance Certificates associated with remediation works were provided to TTMP by CPBG; copies of which are provided in Appendix 21. A summary of the clearance certificates is provided in Table 15.

Plans showing the location of each area cleared are included in the reports included in Appendix 21.



Table 15: Summary of Asbestos Clearance Certificates

Clearance Report Date	Clearance Title	Date of Removal Works	Clearance Location	Asbestos Removed	Licensed Asbestos Removalist	Inspection Date	Comments
30 November 2022	215 Badgerys Creek Road, Bringelly – Inspection Report, 30 November 2022	28 November 2022 – 29 November 2022	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	29 November 2022	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The report included the analysis of 4 soil samples for asbestos as per AS4694-2004. Asbestos was not detected in the samples analysed. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
21 December 2022	215 Badgerys Creek Road, Bringelly – Inspection Report, 21 December 2022	1 December 2022 – 19 December 2022	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	19 December 2022	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
31 January 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 31 January 2023	1 December 2022- 30 January 2023	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	31 January 2023	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
13 February 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 13 February 2023	31 January 2023 – 10 February 2023	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	13 February 2023	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
19 February 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 19 February 2023	11 February 2023 – 16 February 2023	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	17 February 2023	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
23 February 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 23 February 2023	17 February 2023 – 21 February 2023	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	21 February 2023	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The report included the analysis of 13 soil samples for asbestos as per AS4694-2004. Asbestos was not detected in the samples analysed. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
10 July 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 10 July 2023	N/A	Aerotropolis	Asbestos Containing Soil	Mann Group NSW (AD210134)	7 July 2023	Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works. The report included the analysis 8 soil samples from ACM Remediation Area 1 for asbestos as per AS4694-2004. CPBG has advised that samples were appropriately spaced apart and captured the footprint of the stockpile area. Asbestos was not detected in the samples analysed. The Airsafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i> .
10 July 2023	Aerotropolis - 215 Badgerys Creek Road, Bringelly [10.07.23] – 10 July 2023	10 July 2023	Aerotropolis	Decontamination of Sumitomo SH370 LHD excavator	Mann Group NSW (AD210134)	10 July 2023	Photographs provided in the clearance certificate show the excavator following decontamination.



Clearance Report Date	Clearance Title	Date of Removal Works	Clearance Location	Asbestos Removed	Licensed Asbestos Removalist	Inspection Date	Comments
18 July 2023	215 Badgerys Creek Road, Bringelly – Inspection Report, 18 July 2023	N/A	Aerotropolis	Asbestos Containing Soil	Auswide Operations Pty Ltd (AD212715)	14 July 2023	<p>Photographs provided in the clearance certificate show the condition of soil at the ground surface following removal works.</p> <p>The report included the analysis of 15 soil samples for asbestos as per AS4694-2004, 9 samples were taken from ACM Remediation Area 1 and 8 soil samples from ACM Remediation Area 2. CPBC has advised that samples were appropriately spaced apart and captured the footprint of the stockpile area. Asbestos was not detected in the samples analysed.</p> <p>The Aisafe Report stated that <i>"the asbestos removal area does not pose a risk to health and safety"</i> and <i>"the surface has been found to be free of visible asbestos debris"</i>.</p>



## 12. Quality Assurance and Quality Control

Where TTMP has been engaged to complete a programme of assessment that has been used to support the validation of the SBT Site, the findings of that assessment has been documented within a standalone report included in Appendix 10 and against the DQOs/DQIs in Appendix 5. In summary validation data collected by TTMP was undertaken by an experienced environmental scientist in accordance with TTMP standard operating procedures and the RAP. Samples were collected in laboratory provided containers, stored in chilled insulated containers, and submitted to a NATA accredited laboratory (ALS) under chain of custody documentation. Each sample was collected with a new set of nitrile gloves. Samples were received by the laboratory in good condition and analysis was completed within the required holding times for the contaminants of concern. Data collected by TTMP is considered to be directly useable for the validation of the SBT Site.

Selected data from the DSI and RAP was used to support the validation assessment. Data used from the DSI and RAP was assessed to be of suitable quality, and this assessment is not repeated here.

In the preparation of this validation report, TTMP has adopted data generated by CPBG and their subcontractors. This data has been reviewed by TTMP using regular discussions with TTMP representatives involved with that particular aspect of the project to ascertain its accuracy and/or request additional data to support decisions regarding the validation of the SBT Site.

In summary, TTMP consider the data collated to support the validation assessment is reasonably accurate, comparable, precise, complete and representative in which to draw conclusions.

## 13. Conceptual Site Model Post-Remediation

The following table provides a refined CSM illustrating the source-pathway-receptor linkages for the SBT Site based on a commercial or open space land use following remediation. The table includes a summary of whether complete source-pathway-receptor linkages (exposure pathways) could occur. In regard to this summary note:

- 'Likely' refers to an exposure pathway which could occur and if they occur there is potential for an unacceptable risk to the receptor (i.e. a complete exposure pathway)
- 'Potential' refers to an exposure pathway which could occur however further assessment would be required to establish whether an unacceptable risk to receptor could occur.
- 'Unlikely' refers to an exposure pathway which are considered unlikely to occur and therefore it is unlikely that there would be an unacceptable risk to receptor (i.e. an incomplete exposure pathway).
- 'Not applicable' refers to an exposure pathway which is not considered to be plausible and therefore incomplete.

Table 16: Conceptual Site Model Post-Remediation (Source-Pathway-Receptors)

Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway
Demolition materials from Previous Buildings and Structures	Topsoil/fill materials which potentially contain asbestos were removed from the Remediation Area. Accordingly within the footprint of the SBT Site these materials are not longer considered to be a contaminant source.				
Historical use of AFFF at former Defence facility	PFAS	PFAS in Soil	Ingestion  Dermal contact	Construction workers involved with the construction phase of the Sydney Metro SSTOM Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely
				General public including persons who could be subject to contaminated media generated during redevelopment.	Unlikely
			General public accessing the station in the future	Unlikely	
			Terrestrial flora and fauna	Unlikely	
			Aquatic flora and fauna including those in Thompson's Creek	Unlikely	
		PFAS in Surface Water	Ingestion  Dermal contact	Construction workers involved with the construction phase of the SSTOM Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely (Note 1)
				General public including persons who could be subject to contaminated media generated during redevelopment	Unlikely
			General public accessing the station in the future	Unlikely (Note 1)	
			Future residents hydraulically down-gradient of PFAS sources areas	Unlikely (Note 1)	
			Terrestrial flora and fauna within Lot 101 DP1282949	Unlikely	
		Biological uptake mechanisms	Aquatic flora and fauna including those in Thompson's Creek	Unlikely (Note 2)	
			Domestic animals within the Property	Unlikely	



Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway
		Groundwater from PFAS ACs	Ingestion  Dermal contact	Construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site.	Not applicable
				General public including persons who could be subject to contaminated media generated during redevelopment	Not applicable
				General public accessing the station in the future	Unlikely (Note 1)
				Future residents hydraulically down-gradient of PFAS sources areas	Unlikely (Note 1)
				Terrestrial flora and fauna within the Property	Unlikely
				Aquatic flora and fauna including those in Thompson's Creek	Unlikely (Note 2)
				Domestic animals and livestock within the Property	Unlikely (Note 1)
		Terrestrial biota within Property	Consumption, bioaccumulation, biomagnification	Construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site.	Not applicable
				General public including persons who could be subject to contaminated media generated during redevelopment	Not applicable
				General public accessing the station in the future	Unlikely
				Future residents hydraulically down-gradient of PFAS sources areas	Unlikely
		Aquatic biota in Thompsons Creek	Consumption, bioaccumulation, biomagnification	Terrestrial flora and fauna within the Property	Unlikely
				Aquatic flora and fauna including those in Thompson's Creek	Unlikely
				Domestic animals and livestock within the Property	Unlikely
				Workers involved with the SBT work, construction workers involved with the construction phase of the Sydney Metro Stations, Systems, Trains, Operations and Maintenance (SSSTOM) Work Package, workers during the operational and maintenance phase of the SBT Site.	Unlikely

Contamination Source	Contaminants of Concern	Media	Plausible Exposure Pathways	Receptors	Complete exposure pathway
				General public including persons who could be subject to contaminated media generated during redevelopment	Unlikely
				General public accessing the station in the future	Unlikely
				Future residents hydraulically down-gradient of PFAS sources areas	Unlikely
				Terrestrial flora and fauna within the Property	Unlikely (Note 2)
				Aquatic flora and fauna including those in Thompson's Creek	Unlikely (Note 2)
				Domestic animals and livestock within the Property	Unlikely (Note 2)

**Notes:**

- 1) Receptor considered unlikely to ingest media based on use of potable water supply in area.
- 2) The risk of unacceptable exposure is considered unlikely given the removal of PFAS impacted soil and reduction in PFAS mass flux migrating from the SBT Site.

## 14. Current Status of SBT Site

At the time of the preparation of this Validation Report construction activities currently being undertaken at the SBT Site include bulk excavation of the Station Box (refer to Figure H) and excavation of Stub Tunnels.

Excavated materials from the Station Box have been assessed as VENM (refer to Section 11.6.4) and are being stockpiled east of the Station Box in the location shown in Figure I.

Excavated stub tunnel materials which comprise Bringelly Shale and concrete/shotcrete materials are being managed in accordance with NSW Waste Guidelines. The location of materials excavated from the stub tunnels is provided in Figure I.

TTMP consider that the existing procedures are adequate to manage unexpected finds and incidents in the aforementioned activities.



Figure H: SBT Site August 2023

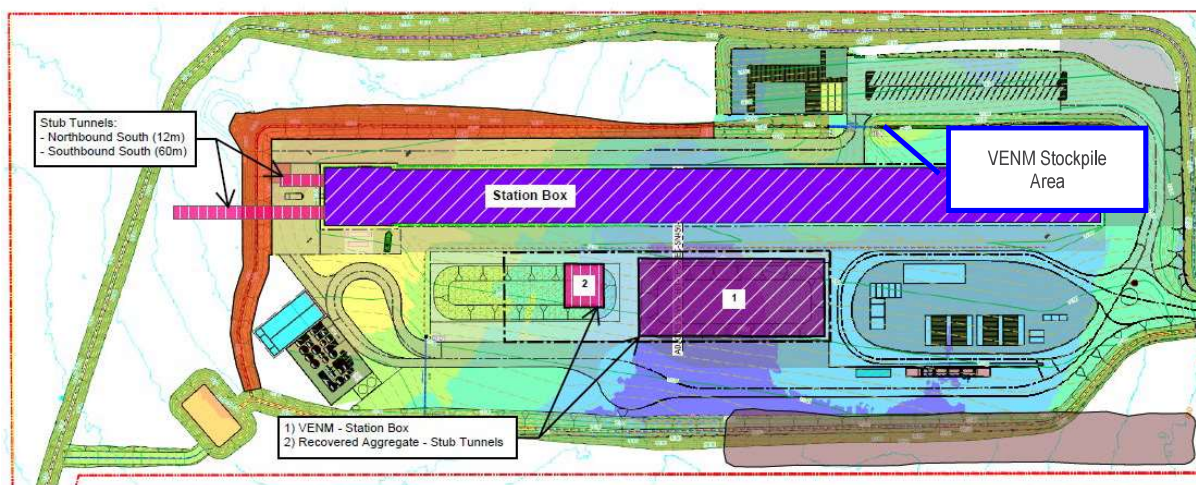


Figure I: Stockpile Materials September 2023



## 15. Conclusions and Recommendations

TTMP concludes that:

- The SBT Site has been remediated in general accordance with the RAP, and materials requiring remediation have been removed and disposed off-site.
- Spoil materials have been reused in accordance with the requirement of the RAP. Site won materials from the Medium Impact Area have been reused within the Medium Impact Area in areas where the future land use is commercial.
- Materials have been disposed off-site in general accordance with material assessments prepared by TTMP.
- Materials imported by CPBG include fill materials for site levelling purposes and aggregates used for haul roads. These materials are to be retained on-site and are considered suitable for the SBT Site for commercial/open space land use based on the information provided by CPBG.
- Unexpected finds and incidents are considered to have been appropriately managed.
- Construction water is being reused on the SBT Site for dust suppression.
- Remaining SBT Site construction activities to be undertaken prior to handover with the SSTOM Contractor can be managed under existing CPBG procedures including those for the management of unexpected finds and incidents. Materials to be disposed off-site are to be managed in accordance with NSW EPA Waste Management Guidelines.
- TTMP considers that contamination has been appropriately managed during the SBT Works, and the SBT Site is suitable for the generic commercial and open space land uses as shown in Figure 3, Appendix 1.



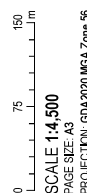
## Appendix 1 Figures







Site boundaries from Tetra Tech Coffey.  
Station box, layouts and alignment supplied by CPBG.  
Cadastral and property boundary from DFSI.  
Aerial imagery from Nearmap (capture date 30/03/2023).



## WESTERN SYDNEY AIRPORT STATION BOXES AND TUNNELLING WORKS

# Site Property Plan Aerotropolis Core Station



 Tunnel Alignment  
 Tunnel Alignment - Chainage  
 Tunnel Alignment - Cross Passage  
 Cadastral Boundary  
 Property Boundary  
 SBT Site Boundary  
 Station Box / Shaft