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Integrated Practical Solutions

Remediation Action Plan
For Encapsulation of Contaminated Soil

Surface & Civil Alignment Works (SCAW) Package for
Sydney Metro - Western Sydney Airport (SMWSA)
PS-105, Luddenham Road, Orchard Hills

Prepared for
CPB Contractors Pty Limited & United Infrastructure
Pty Limited Joint Venture (CPBUI JV)

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		22 December 2023
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Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.



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Executive Summary

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) for the Surface and Civil Alignment Works (SCAW) package for Sydney Metro - Western Sydney Airport (SMWSA) at PS- 105, Luddenham Road, Orchard Hills. The RAP was commissioned by CPBUI JV.

It is understood that asbestos contaminated soil (not sourced from PS-105) is proposed to be encapsulated at PS-105 and maintained under a long-term environmental management plan (EMP). The remediation objectives are to:

- Retain asbestos contaminated soil at PS-105 (wherever possible);
- Address potentially unacceptable risks to human health or environmental values from contamination; and
- Make the site (PS-105) suitable for future use (from a contamination perspective).

This RAP details the requirements to meet the remediation objectives. It is understood that the requirements provided in this RAP will be used for design of the encapsulation of the contaminated soil.

The location of PS-105 ('Stockpile PS-105') is shown on Drawing SMWSASCA-CPU-OHE-SF153-EW-DRG-232081 in Appendix A and is approximately 500 m to the east of the (future) rail alignment.

In brief, the general sequence of remediation works for the encapsulation of contaminated soil at PS- 105 should include:

- The Contractor shall secure the site to ensure that all safety and environmental controls are implemented;
- A temporary stockpiling area(s) is to be established for the (temporary) storage of contaminated soils;
- The location for the (final) placement of contaminated soil is to be inspected by a geotechnical engineer to confirm that geotechnical conditions are suitable for the placement and compaction of contaminated soil;
- The ground levels at the designated encapsulation area are to be surveyed;
- The Contractor is to check that the contaminated soil (to be encapsulated at PS-105) has been assessed as suitable for the encapsulation at PS-105 by the Environmental Consultant;
- The contaminated soil is to be placed at the proposed encapsulation location;
- The Contractor is to maintain a register of all soil designated for encapsulation;
- Where asbestos contaminated soil has been temporarily stockpiled outside of the area designated for encapsulation, the licenced Asbestos Assessor is to provide clearance for the removal of asbestos from the temporary stockpiling area. Where stockpiles of contaminated soil have been placed on bare soil, the footprint of stockpiles is to be validated through inspection, sampling and analysis by the Environmental Consultant;
- Following the completion of the placement of contaminated soil, the brightly coloured (e.g., orange) geo-textile barrier (marker layer) is to be placed to cover (the entirety of) the contaminated soil;
- The levels and extent of the marker layer are to be surveyed by a registered surveyor;

- Soil (deemed suitable by the Environmental Consultant) is to be placed to over the entire marker layer to complete the physical barrier (at the required thickness). The Environmental Consultant is to conduct periodic inspections of the placement of soil as capping. The Contractor is to maintain a register of all soil used as part for the capping;
- Where the thickness of capping soil is to exceed 2 m, the levels and extent of the top of placed untested capping soil is to be surveyed by a registered surveyor prior to the placement of the tested soil designated for used in the top 2 m;
- The levels of the final landform (i.e., top of cover) are to be surveyed; and
- Seeding and placement of site-won rocks and logs / stumps in a manner that does not reduce the thickness of clean fill cover.

The remediation and validation methods and approach are documented in this RAP. In addition, this RAP provides a general site management plan.

A validation assessment report will be prepared by the Environmental Consultant. Following completion of the validation report, a long-term environmental management plan (EMP) will need to be prepared. The EMP will document the (legally enforceable) requirements for monitoring and maintenance of the physical barrier, as well as (legally enforceable) requirements for works that penetrate the physical barrier.

With implementation of this RAP (and future EMP), it is considered that asbestos contaminated soil can be encapsulated at the PS-105 site and be made suitable for the intended future land use (i.e., a publicly accessible landscape area). Any updates / revisions to design plans for the PS-105 Stockpile should be forwarded to the Environmental Consultant and Site Auditor for review and approval prior to commencement of works at PS-105.

Table of Contents

	Page
1. Introduction.....	1
2. Site Identification and Proposed Development	2
3. Scope of Work.....	3
4. Site Condition, Environment, History and Potential for Contamination	3
4.1 Site Condition and Environment	3
4.2 Environmental Impact Statement.....	4
4.3 Previous Investigation Data	5
4.4 Aerial Photography (2000 to 2022).....	5
4.5 Site Contamination Potential	6
5. Conceptual Site Model for Encapsulation	6
6. Requirements for Contaminated Soil to be Encapsulated	8
7. Requirements for Physical Barrier (Capping)	9
7.1 Capping Materials and Thickness.....	9
7.2 Clean Fill for Capping	10
8. Sequence of Remediation Works	15
9. Acceptance Criteria	16
10. Validation Plan	17
10.1 Data Quality Objectives	17
10.2 Validation Assessment Requirements	17
10.3 Characterisation of Stockpiles for Encapsulation	18
10.4 Temporary Stockpile Area Footprint Sampling Frequency	18
11. Other Imported Material	19
12. Waste Removal & Disposal of Contaminated Soil (Contingency)	19
13. Quality Assurance and Quality Control	20
14. Management and Responsibilities	21
14.1 Site Management Plan.....	21
14.2 Site Responsibilities	22
15. Validation Reporting	22
15.1 Documentation	22
15.2 Reporting	23

16. Conclusions.....	23
17. References.....	23
18. Limitations	24

Appendices

Appendix A:	Drawing
Appendix B:	Notes About this Report
Appendix C:	Data Quality Objectives
Appendix D:	Site Management Plan
Appendix E:	Environment Protection Licence
Appendix F:	Plans, Logs and Results Summaries from Previous Investigations

Remediation Action Plan for Encapsulation of Contaminated Soil

Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)

PS-105, Luddenham Road, Orchard Hills

1. Introduction

Douglas Partners Pty Ltd (DP) has prepared this remediation action plan (RAP) for the Surface and Civil Alignment Works (SCAW) package for Sydney Metro - Western Sydney Airport (SMWSA) at PS-105, Luddenham Road, Orchard Hills. The RAP was commissioned by CPBUI JV.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

It is understood that asbestos contaminated soil (not sourced from PS-105) is proposed to be encapsulated at PS-105 and maintained under a long-term environmental management plan (EMP). The remediation objectives are to:

- Retain asbestos contaminated soil at PS-105 (wherever possible);
- Address potentially unacceptable risks to human health or environmental values from contamination; and
- Make the site (PS-105) suitable for future use (from a contamination perspective).

This RAP details the requirements to meet the remediation objectives. It is understood that the requirements provided in this RAP will be used for design of the encapsulation of the contaminated soil.

CPBUI JV has engaged NSW EPA accredited site auditor, Melissa Porter, to complete a site audit under the *Contaminated Land Management Act 1997* (NSW) which involves review of this RAP and associated reports.

It should be noted that this RAP does not form a detailed specification for the proposed site remediation works, but rather represents a planning document which outlines the means by which site remediation can be achieved.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

2. Site Identification and Proposed Development

The SCAW package relates to the proposed construction of approximately 10 km of rail alignment between Orchard Hills and the Western Sydney International (future) airport consisting of a combination of viaducts and surface rail. Areas alongside the proposed rail alignment will be used by contractors or for staging and maintenance for the Metro.

The location of PS-105, 'Stockpile PS-105', is shown on Drawing SMWSASCA-CPU-OHE-SF153-EW-DRG-232081 in Appendix A and is approximately 500 m to the east of the (future) rail alignment. A site locality plan is also provided as Drawing 1, Appendix A. According to NSW Spatial Services, SIX Maps, PS-105 is located at the northern part of Lot 51 Deposited Plan 1276956 which has street address 43B Luddenham Road, Orchard Hills. The Stockpile PS-105 area covers approximately 4.5 ha (although it is noted that the final area of Stockpile PS-105 may ultimately depend on the volume of encapsulated soil and final landform). For the purpose of this RAP, the location of the Stockpile PS-105 will be referred to as 'the site'. Given that the exact dimensions of Stockpile PS-105 will not be known until formed, a survey of the site boundary has not been provided in this report. (Note that the requirement to survey the PS-105 Stockpile once formed is included in this RAP).

According to NSW Planning Portal Spatial Viewer, the eastern part of PS-105 has land use zone RE1 Public Recreation and the western part of PS-105 has land use zone RU2 Rural Landscape. The local government authority is Penrith City Council.

According to the *Place, Urban Design and Corridor Landscape Plan* (PUDCLP) (reference: SMWSASCA-CPU-SWD-EW000-AT-RPT-620000 REV G, December 2022) for the project, stripped topsoil from excavation works for the SCAW project was planned to be (permanently) stockpiled at PS-105 and be subject to landscaping. Conceptually, the landscape of Stockpile PS-105 is to include:

- A natural shape with smooth transitions into the surrounding topography;
- Batter slopes of less than or equal to 3 (horizontal) to 1 (vertical);
- At least 400mm cover of topsoil to enable revegetation of the native bushlands;
- Seeding of topsoil for the growth of endemic trees, shrub grasses and groundcovers;
- The placement of excess site-won rocks if found; and
- The placement of excavated logs / stumps and woody debris to provide habitat.

Potentially up to 300,000 m³ of soil may be placed in Stockpile PS-105. It is noted, however, that the total volume of soil placed in Stockpile PS-105 is understood to be in the order of 115,000 m³.

It is understood from Sydney Metro, at the time of preparing this RAP:

- CPBUI JV is to complete the landscaped mound at PS-105 under the SCAW package;
- Following completion of SCAW, vegetation at the mound is to be maintained under the Corridor Landscape Work (CLW) package for SMWSA;
- The mound PS-105 is anticipated to remain as a vegetated landform in perpetuity;
- PS-105 will be publicly accessible; and

- Based on the draft zoning plan being prepared by the NSW Department of Planning and Environment, the PS-105 area will most likely be zoned part C2 Environmental Conservation, part RE1 Public Recreation and part SP2 Infrastructure (Drainage).

3. Scope of Work

The scope of works to achieve the objective is as follows:

- Present a conceptual site model (CSM) to list potential pathway and receptor linkages to address potential risks to relevant environmental values from contamination;
- Establish the remediation acceptance criteria (RAC) to be adopted for validation of remediation;
- Identify how successful implementation of the RAP will be validated;
- Outline handling requirements for contaminated soil;
- Outline environmental safeguards required to complete the remediation works; and
- Include a contingency plan.

4. Site Condition, Environment, History and Potential for Contamination

4.1 Site Condition and Environment

Table 1 provides a summary of information relating to the location of PS-105 condition and environment.

Table 1: Site Condition and Environment

Item	Details
Geology	The Penrith 1:100 000 Geology Sheet indicates that the site is underlain by fluvial sediments comprising fine-grained sand, silt and clay; and is close to an area underlain by Bringelly Shale comprising shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. NSW Seamless Geology indicates that the majority of the site is underlain by Bringelly Shale and the north-western corner of the site is underlain by alluvial floodplain deposits comprising silt, very fine- to medium-grained lithic to quartz-rich sand, and clay.
Soil landscape	The northern part of the site is within the South Creek soil landscape which comprises alluvial soils and the southern part of the site is within the Blacktown soil landscape which comprises residual soils (Penrith 1:100,000 Soils Landscape Sheet).
Topography	The site is at approximately 30 m AHD. Slopes at and around the site are generally down to the north and northeast.

Item	Details
Salinity	The site is at an area of moderate salinity potential (Department of Infrastructure Planning and Natural Resources, <i>Salinity Potential in Western Sydney Map</i>).
Acid sulfate soils	The site is not within an area or close to an area associated with a risk of acid sulfate soils (NSW Acid Sulfate Soil Risk map).
Surface water bodies and surface water flow.	There are no surface water bodies at the site. A farm dam is nearby, approximately 70 m to the south-east of the site. Badgerys Creek is located approximately 500 m to the west of the site. South Creek is located approximately 600 m to the east. Based on topography, surface water runoff is expected to generally flow to the north and north-east towards South Creek.
Groundwater flow direction and discharge	Based on topography, shallow groundwater (if any) is expected to flow to the north or northeast and discharge to South Creek.
Registered groundwater bores	There are no registered groundwater bores within 500 m of the site.
Site use and features	Currently the site is used for temporary stockpiling of soil for SCAW. Prior to the commencement of the SCAW project, the site took on the appearance of grazing land with a grass cover, some trees, and no structures.
Surrounding land use	Areas to the south and east are currently subject to works associated with SCAW. Otherwise, surrounding land is used for rural purposes comprising mainly grazier land with minor buildings. An old race / training track is present to the north.

4.2 Environmental Impact Statement

M2A, *Technical Paper 8 Contamination*, October 2020 (M2A, 2020) which was prepared for *Sydney Metro - Western Sydney Airport Environmental Impact Statement*, included a desktop review to understand the local environment, identify sensitive receptors and identify areas of environmental concern (AECs) relating to existing contamination with the SMWSA construction footprint. This included a review of NSW EPA databases, National Pollution Inventory industrial facilities, public registers pertaining to loose-fill asbestos insulation, Defence sites (current and former), unexploded ordnance mapping, historical aerial photographs (from years 1947, 1955, 1970, 1980, 1994, 2005 and 2019, where available), historical commercial and directory trade data for selected parts of the study area, and available contamination investigation, assessment and remediation reports.

The site was not identified as a medium or high risk AEC and was given a low risk ranking. The risk rankings were used to inform the type of mitigation measures to manage the contamination risk. Proposed mitigation for areas of low risk would be detailed under a construction environmental management plan including an unexpected finds protocol, or soil and water management plan (whereas proposed mitigation measures for medium or high risk AEC includes further investigation).

Aerial photographs showed that the PS-105 Stockpile site and surrounding area were used for pastoral land since 1955 and there was no visible infrastructure at the site and general surrounding area except for fencing, dams, unsealed roads and a horse training track.

Under the *Contaminated Land Management Act 1997*, there were no NSW EPA regulated or notified sites within 1 km of Stockpile PS-105. Under the *Protection of the Environment Operations Act 1997*, there were no licensed sites (including former licensed sites) within 1 km of Stockpile PS-105. There were no NSW EPA PFAS investigation sites within 2 km of Stockpile PS-105.

The marked-up Figure A8 from M2A (2020) in Appendix A shows the location of Stockpile PS-105 with respect to the closest (medium or high risk) AEC. AEC 33 is located approximately 140 m to the west of Stockpile PS-105 and AEC 34 is located approximately 90 m to the south of Stockpile PS-105. The potential contamination sources at AEC 33 and AEC 34 were listed as: potential filled areas; and areas of potential hazardous building material.

4.3 Previous Investigation Data

Cardno (NSW/ACT) Pty Ltd (Cardno), *Contamination Assessment Report – Phase D/E, Sydney Metro Western Sydney Airport*, 26 November 2021 (RevB, 80021888) (Cardno, 2021) provides the results of intrusive investigations at SMWSA. The closest test location to the site was test pit SMGW-TP-B353 which was positioned approximately 20 m to the east of Stockpile PS-105. The test pit location is shown on Geotechnical Investigation Plan (8 of 22), extracted from Carno (2021), in Appendix F. The test pit log is provided in Appendix F. At SMGW-TP-B353, silty sand fill (topsoil) to a depth of 0.4 m was underlain by natural clayey sand to a depth of 1.5 m. Groundwater was not encountered.

Soil samples from SMGW-TP-B353 were analysed for various suites of the following: benzene, toluene, ethylbenzene and xylenes (BTEX); monocyclic aromatic hydrocarbons (MAH); total recoverable hydrocarbons (TRH); metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc); nickel in toxicity characteristic leaching procedure (TCLP); asbestos; pH; organochlorine pesticides (OCP); organophosphorus pesticides (OPP); herbicides; insecticides; polycyclic aromatic hydrocarbons (PAH); phenols; polychlorinated biphenyls (PCB); per- and polyfluorinated Substances (PFAS); chlorinated hydrocarbons; halogenated hydrocarbons; halogenated phenols; and solvents. A summary of results, extracted from Carno (2021), is provided in Appendix F. Concentrations of BTEX, MAH, TRH, cadmium, mercury, OCP, OPOP, herbicides, insecticides, PAH, phenols, PCB, chlorinated hydrocarbons, halogenated hydrocarbons, halogenated phenols, and solvents were less than the laboratory practical quantitation limits. Concentrations of arsenic (maximum 5.1 mg/kg), chromium (maximum 19 mg/kg), copper (11 mg/kg), lead (maximum 11 mg/kg), nickel (maximum 7.1 mg/kg) and zinc (maximum 16 mg/kg) were low (at typical background levels). Concentrations of PFAS were less than the practical quantitation limits except for the concentration of perfluorooctanoic acid (PFOS) in the sample from depth 0.1 m (0.0002 mg/kg) which was slightly above the practical quantitation limit and within the adopted assessment criteria.

4.4 Aerial Photography (2000 to 2022)

A review of aerial photography in MetroMap (for years 2000, 2005, 2007, 2009, 2011, 2014, 2015, 2016, 2018, 2019, 2020, 2021 and 2022) indicates that the site was part of land used for grazing in the 22 years prior to commencement of SCAW. No structures have been present at the site during that time.

4.5 Site Contamination Potential

Based on the review of the information presented above, it is considered that (prior to commencement of the SCAW project) there were no potential point sources of contamination at the site or in close proximity to the site. AEC 33 and AEC 34 are not considered to be potential off-site sources of site contamination given their distance from the site and the nature of the potential contamination sources listed in M2A (2020) for each of these AEC. As per the recommendations in M2A (2020), it is considered that a detailed investigation for site contamination does not appear to have been warranted given the absence of potential point sources of contamination and the previous land use (grazing).

It is noted that an Unexpected Contaminated Land and Asbestos Finds Procedure is provided in CPBUI JV, *Soil and Water Management Sub-plan, Western Sydney Airport – Surface and Civil Alignment Works*, November 2022 for the case if and when contaminated materials are discovered or suspected during SCAW, including at the site. The *Soil and Water Management Sub-plan* is a sub-plan of the CPBUI JV, *Construction Environment Management Plan (CEMP), Western Sydney Airport – Surface and Civil Alignment Works*, November 2022 for SCAW.

5. Conceptual Site Model for Encapsulation

At the time of preparing this RAP, the volume of contaminated soil to be encapsulated is being assessed and may include:

- Asbestos contaminated soil associated with planned remediation works at Area of Environmental Concern (AEC) 43 (with the plan for remediation works at AEC 43 documented in DP, *Remediation Action Plan, Surface & Civil Alignment Works (SCAW) Package for Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA), Area of Environmental Concern (AEC) 43, 1793 Elizabeth Drive, Badgerys Creek*, May 2023, reference 204814.01.RAP.001.Rev3);
- Asbestos contaminated soil associated with planned remediation works at AEC 36 (with the plan for remediation works at AEC 36 documented in DP, *Remediation Action Plan, Surface & Civil Alignment Works (SCAW) Package for Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA), Area of Environmental Concern (AEC) 36, Patons Lane, Orchard Hills*, July 2023, reference 204814.01.RAP.004.Rev1); and
- Asbestos contaminated soil associated with unexpected finds during excavation works for the SCAW project.

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM in Table 2 below has been prepared to identify possible source – receptor linkages that need to be addressed for the keeping of contaminated soil at PS-105. The risk management approaches adopted for preparation of this RAP for each possible source-receptor linkage is also listed.

Table 2: Summary of Potentially Complete Exposure Pathways

Source	Transport Pathway	Receptor	Risk Management Approach
Material to be encapsulated at PS-105 that is contaminated with asbestos and possibly has other chemical contaminants	- Ingestion and dermal contact - Inhalation of dust and/or vapours	- Construction workers for SMWSA	- Safe work procedures and site management plan (See Section 14). - Chemical concentrations are not to be at levels which pose a human health risk (see Section 6).
	- Ingestion and dermal contact - Inhalation of dust and/or vapours	- Future maintenance workers (following the completion of construction works for SMWSA)	- Contaminated soil is to be encapsulated. - Establishment and implementation of a long-term EMP.
	- Ingestion and dermal contact - Inhalation of dust and/or vapours	- Future site users	- Contaminated soil is to be encapsulated. - Establishment and implementation of a long-term EMP.
	- Inhalation of dust and/or vapours	- Adjacent site users	- Safe work procedures and site management plan (See Section 14). - Contaminated soil is to be encapsulated. - Establishment and use of a long-term EMP.
	- Surface water run-off - Leaching of chemical contaminants, vertical migration into groundwater and lateral migration of groundwater providing base flow to water bodies	- Surface water bodies	- Spoil / stockpile management procedures to be adopted during construction (See Section 14) - Soils are to be assessed as not posing a leaching risk to surface water (see Section 6).
	- Leaching of chemical contaminants, and vertical migration into groundwater	- Groundwater	- Soils are to be assessed as not posing a leaching risk to groundwater (see Section 6).
	- Inhalation, ingestion and absorption of chemical contaminants	- Terrestrial ecosystems	- Soil as part of physical barrier (above the geotextile marker layer) is not to pose a risk to terrestrial organisms (see Section 7). - Establishment and use of a long-term EMP.

6. Requirements for Contaminated Soil to be Encapsulated

Contaminated soils that are to be designated for encapsulation at PS-105 will need to meet the following requirements:

- The soil can be legally accepted at the PS-105 site (in accordance with *Contaminated Land Management Act 1997*; *Protection of the Environment Operations Act 1997*; and *Environmentally Hazardous Chemicals Act 1985*). It is noted that NSW EPA Environment Protection Licence (EPL) 21695 allows for excavated material suitable for re-use within the SCAW project boundaries to be transported to another area within the SCAW project boundaries by road. A copy of the EPL is provided in Appendix E. (Any future revision of the EPL will need to be considered);
- The soil is to have concentrations of potential chemical contaminants (i.e., excluding asbestos) that do not pose a health risk to construction and maintenance workers; and
- The leachability of chemical contaminants in the soil (if present) is assessed as not posing an unacceptable risk to groundwater and surface water bodies adjacent the site.

It is noted that, according to Schedule 1 of the *Protection of the Environment Operations Act 1997* NSW (POEO Act), the storage of more than 30,000 m³ of contaminated soil is a scheduled activity (i.e., contaminated soil treatment). At the time of preparing this RAP, EPL 21695 (see Appendix E) did not have contaminated soil treatment as a listed scheduled activity. If more than 30,000 m³ of contaminated material is to be encapsulated, then the EPL will need to be updated / amended accordingly. (It is understood that it is anticipated that less than 30,000 m³ of contaminated soil is to be encapsulated at PS-105).

The Environmental Consultant is to assess the suitability of (nominated) contaminated soil for encapsulation at PS-105 given the above listed requirements. The assessment is to include review of a characterisation assessment report of the soil which should include the information on the source of the stockpile, an assessment on the potential contaminants based on history and land use information, the results of sampling and testing for potential contaminants at an appropriate sample density. Further inspection and / or sampling and analysis may be recommended by the Environmental Consultant where it is considered that the contaminated soil has not been adequately characterised and / or leachability needs to be assessed. (See Section 10.3 for sample frequencies for characterisation of stockpiles for encapsulation).

With respect to assessment of concentrations of chemical contaminants in soil, health-based assessment criteria may include:

- Health investigation levels (HIL) for commercial / industrial land use D from Table 1A(1) of NEPC (2013);
- Health screening levels (HSL) for vapour intrusion and HSL for direct contact for Intrusive Maintenance Worker from Tables A3 and A4 of CRC Care, *Technical Report No. 10, Health screening levels for petroleum hydrocarbons in soil and groundwater, Part 1: Technical development document*, 2011 (CRC, 2011); and
- Human health investigation levels for soil from Table 2 of Heads of EPAs Australia and New Zealand (HEPA), *PFAS National Environmental Management Plan, Version 2.0*, January 2020 (HEPA, 2020).

It is noted that, for mobile contaminants such as per- and poly-fluoroalkyl substances (PFAS) and some organic compounds, the assessment of the contaminated soil with respect to leachability is likely to be of more significance than the assessment with respect to human health.

Where there are (obvious) large fragments of asbestos containing materials (ACM) in asbestos contaminated soil, it may be recommended to remove observed large ACM fragments by hand (by the Asbestos Contractor) and appropriately dispose of the ACM to a licensed landfill. This is so that the risk of releasing asbestos fibres into the air is reduced for excavation and compaction works.

7. Requirements for Physical Barrier (Capping)

7.1 Capping Materials and Thickness

WorkCover NSW, *Managing asbestos in or on soil*, March 2014 (WorkCover, 2014) provides general guidance on the assessment and management of asbestos in soil and refers to Western Australia Department of Health (WADOH), *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009 (WADOH, 2009) for additional guidance on the assessment and management of asbestos in or on soil. According to WADOH (2009):

- A barrier of cover over asbestos contaminated soil is usually a layer of clean fill that should be at least 1 m thick for public open spaces and at least 0.5 m for all other uses (e.g., residential or commercial). The greater depth for the public space is because of: the potential for deeper below-ground activity associated with such areas, such as irrigation systems and service trenches; the potential lower awareness of the presence of the contamination; and the increased practicability of having such deep covers;
- A 0.5 m thick cover may need to be increased to avoid contamination disturbance by subsequent installation of sub-surface utilities below 0.5 m, unless any contamination excavated is properly managed and not mixed in with material used for backfilling;
- For covers of less than 3 m, management measures such as notification on the land title, a geotextile barrier, an ongoing management plan, and vegetation cover, would be expected. If all of these additional measures are used, then it may be argued that the depth of clean fill may be reduced; and
- A vegetative barrier can be very useful in protecting the clean fill cover from erosion and also from some forms of human disturbance.

On the basis that no in ground utilities or service trenches are proposed for the PS-105 Stockpile area, a vegetation cover is to be established by seeding, a legally enforceable EMP is to be established and implemented (by a method to be agreed), it is considered that the physical barrier (capping) for the encapsulation for the contamination soil at PS-105 will comprise:

- The inclusion of a brightly coloured (e.g., orange) geo-textile barrier to act as a warning layer for the presence of underlying soil contamination. The geo-textile is to be placed in parallel sheets to be fixed together or overlap by 0.2 m; and
- At least 0.5 m of clean fill over the geo-textile barrier layer. This includes a minimum of 0.4 m of topsoil to enable revegetation as per PUDCLP.

If tree planting is proposed (as an alternative to seeding), the thickness of clean fill cover may need to be increased to allow for excavations for tree planting to not penetrate the geo-textile barrier.

As per PUDCLP, the steepness of batter slopes should be limited to prevent erosion.

7.2 Clean Fill for Capping

Any soil to be used as clean fill for the physical barrier (capping) will only be accepted for use if:

- It can legally be accepted onto the site. For example:
 - o The material is classified as virgin excavated natural material (VENM) and is accompanied by a report / certificate prepared by a qualified environmental consultant;
 - o The material classified under a NSW EPA RRO, provided the material can be used on site in accordance with the corresponding RRE. This could include excavated natural material (ENM), classified under NSW EPA Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, *The excavated natural material order 2014* (NSW EPA, 2014d); and
 - o It is permitted by a condition of the NSW EPA Environment Protection Licence for the project.
- Visual inspection (by the Environmental Consultant) of the material is consistent with supporting documentation (where available); and
- Visual inspection (by the Environmental Consultant) of the material confirms that the soil has no anthropogenic materials or signs of potential contamination, or that soil containing anthropogenic material or signs of potential contamination has been assessed by sampling and laboratory analysis by the Environmental Consultant as being suitable from a contamination perspective (see Table 3).

Given that the site will be a publicly accessible landscaped area, concentrations of chemical contaminants in the imported material are to be within health investigation levels (HIL), ecological investigation levels (EIL), ecological screening levels (ESL), ecological guideline values and management limits for a public open space land use (land use category C) in NEPC (2013). In addition, the leachability of chemical contaminants in soil (if present) is to be assessed as not posing an unacceptable risk to groundwater and surface water bodies adjacent the site.

The classification report / certificate for all material proposed for import (including quarried material) must be reviewed and approved in writing by the Environmental Consultant prior to import. Materials to be imported may need to meet geotechnical and landscaping requirements which are to be assessed by others, as required.

Table 3 provides the inspection, sampling and analysis requirements for assessing material proposed to be used for capping. Note that the requirements for sampling and analysis differ where soil sourced from SCAW is to be used in the upper 2 m of capping compared to soils sourced from SCAW used as capping at a greater depth.

Table 3: Inspection, Sampling and Analysis Requirements for Capping Materials

Material	Type of Material or Classification	Inspection, Sampling and Analysis Requirements
Material imported to SCAW (i.e., sourced from outside of the SCAW boundary)	Quarried (virgin excavated) material	The imported material is to be inspected by the Environmental Consultant upon import and prior to placement in PS-105, however, validation sampling and analysis need not be undertaken where no signs of contamination are noted. The environmental consultant is to make a record comprising photographs, field observation notes and material descriptions of the imported material.
	VENM (not from a quarry) or ENM	The Environmental Consultant is to inspect and photograph the material at the source site (and make a record of the inspection). The Environmental Consultant is to inspect and photograph the imported material upon import and prior to placement in PS-105 and record observations (including material descriptions) in field notes. Check sampling is to be conducted at a rate of one sample per 200 m³ to 1000 m³, with a minimum of five samples for each source site, for material that has been imported to the site, depending on the risk of contamination at the source site/ Analysis of samples would be for potential contaminants based on source site history (from supplier documentation). These may include: eight priority metals, PAH, TRH, BTEX, OCP, OPP, PCB, phenols, PFAS and asbestos. (Results for VENM are to be consistent with expectations of 'clean' soil, including concentrations of organic chemicals less than the laboratory practical quantitation limits and metals at concentrations within typical background levels).
	Material classified under RRO other than ENM	The Environmental Consultant is to inspect and photograph the imported material upon import and prior to placement in PS-105 and make a record of observations in field notes (including material descriptions). Sampling and analysis will need to be determined by the Environmental Consultant and will depend on the source of the material and adequacy of the supporting documentation provided. Any recycled materials (such as recycled aggregates or topsoils) must be sampled at a minimum frequency of one sample per 25 m³ for imported material, with a minimum of three samples per imported batch. For non-recycled materials, check sampling may be done at a minimum frequency of one sample per 250 m³ with a minimum of five samples.

Material	Type of Material or Classification	Inspection, Sampling and Analysis Requirements
		Analysis of samples will generally be for asbestos, PCB, eight priority metals, TRH, BTEX, PFAS and OCP and any other potential contaminants (e.g., VOC, herbicides, etc.) identified by the Environmental Consultant. Prior inspection of the material at the source site by the Environment Consultant is recommended where a batch (stockpile) has been designated for import to the site.
Material sourced from SCAW* and to be used in the top 2 m of capping.	Material classified as VENM or ENM or has otherwise been validated at the source (by inspection, sampling and analysis) as being suitable for use at PS-105 by an environmental consultant.	The Environmental Consultant is to inspect (and photograph) the material upon import and prior to placement in PS-105 to confirm material volume and composition with original assessment / classification documentation (which is to be reviewed by the Environmental Consultant). The Contractor is to provide tracking information to the Environmental Consultant. The Environmental Consultant is to record observations in field notes. Check sampling of stockpiled material may be done at the Environmental Consultant's discretion. The rate of check sampling will depend on the Environmental Consultant's observations and may vary between one sample per 25 m³ and one sample per 1000 m³ (e.g., a higher rate of sampling may be appropriate if signs of potential contamination are observed in the stockpiled material). Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP and PFAS (PFOS, PFOA and PFHxS).
	Stockpiled material that appears to be non-heterogeneous, exhibits no signs of contamination and has no anthropogenic items (and does not have assessment documentation from an environmental consultant).	The Environmental Consultant is to inspect and take photographs of the material upon import and prior to placement in PS-105 and record observations in field notes (including material descriptions). The Contractor is to provide tracking information to the Environmental Consultant. For stockpiles up to 250 m³, the Environmental Consultant is to conduct sampling at a minimum rate of one sample per 25 m³. For stockpiles greater than 250 m³, the Environmental Consultant is to collect one sample per 250 m³ or a minimum of 10 samples. Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP, and PFAS (PFOS, PFOA and PFHxS).

Material	Type of Material or Classification	Inspection, Sampling and Analysis Requirements
	Stockpiled material that appears to be heterogeneous (mixed), has signs of contamination or anthropogenic items (and does not have assessment documentation from an environmental consultant).	The Environmental Consultant is to inspect and take photographs of the material upon import and prior to placement in PS-105 and record observations in field notes (including material descriptions). The Contractor is to provide tracking information to the Environmental Consultant. The Environmental Consultant is to conduct sampling at a minimum rate of one sample per 25 m³ with a minimum of three samples. Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP, OPP, phenols and PFAS (PFOS, PFOA and PFHxS).
Material sourced from SCAW* and to be used below the top 2 m of capping.	Material classified as VENM or ENM or has otherwise been validated at the source (by inspection, sampling and analysis) as being suitable for use at PS-105 by an environmental consultant.	The Environmental Consultant is to inspect and photograph the material upon import and prior to placement in PS-105 to confirm material volume and composition with original assessment / classification documentation (which is to be reviewed by the Environmental Consultant). The Contractor is to provide tracking information to the Environmental Consultant. The Environmental Consultant is to record observations in field notes (including material descriptions). Check sampling of stockpiled material may be done at the Environmental Consultant's discretion. The rate of check sampling will depend on the Environmental Consultant's observations and may vary between one sample per 25 m³ and one sample per 1000 m³ (e.g., a higher rate of sampling may be appropriate if signs of potential contamination are observed in the stockpiled material). Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP and PFAS (PFOS, PFOA and PFHxS).
	Stockpiled material that appears to be non-heterogeneous, exhibits no signs of contamination and has no anthropogenic items (and does not have assessment documentation)	The Environmental Consultant is to inspect and photograph the material upon import and prior to placement in PS-105. The Contractor is to provide tracking information to the Environmental Consultant. The Environmental Consultant is to record observations in field notes (including material descriptions). Check sampling of stockpiled material may be done at the Environmental Consultant's discretion. Sampling will need to be undertaken where anthropogenic materials or signs of contamination are observed. The rate of check sampling will depend

Material	Type of Material or Classification	Inspection, Sampling and Analysis Requirements
	from an environmental consultant).	on the Environmental Consultant's observations and may vary between one sample per 25 m ³ and one sample per 1000 m ³ (e.g., a higher rate of sampling will be appropriate if signs of potential contamination are observed in the stockpiled material). Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP and PFAS (PFOS, PFOA and PFHxS).
	Stockpiled material that appears to be heterogeneous (mixed), has signs of contamination or anthropogenic items (and does not have assessment documentation from an environmental consultant).	The Environmental Consultant is to inspect (and photograph) the material upon import and prior to placement in PS105. The Environmental Consultant is to record observations in field notes (including material descriptions). The Contractor is to provide tracking information to the Environmental Consultant. The Environmental Consultant is to conduct sampling at a minimum rate of one sample per 25 m ³ with a minimum of three samples. Analysis of samples would generally be for asbestos, TRH, BTEX, eight priority metals, PAH, OCP, PCB, phenols, OPP and PFAS (PFOS, PFOA and PFHxS).

Notes: * The volume of material sourced from SCAW is likely to make up the majority of the PS-105 mound.

Eight priority metal are: arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc

VENM – Virgin Excavated Natural Material

ENM - Excavated Natural Material

RRO – Resource Recover Order

PAH - polycyclic aromatic hydrocarbons

TRH - total recoverable hydrocarbons

BTEX - benzene, toluene, ethylbenzene and xylene (BTEX)

OCP - organochlorine pesticides

OPP - organophosphorus pesticides

PCB - polychlorinated biphenyls (PCB)

VOC – Volatile organic compounds

PFAS - Per-and polyfluoroalkyl substances

PFOS - Perfluorooctane sulfonate

PFOA - Perfluorooctanoic acid

PFHxS - Perfluorohexane sulfonate

To confirm that the imported material is suitable from an ecological perspective, testing of selected samples for soil parameters (e.g., pH and cation exchange capacity) may need to be undertaken by the Environmental Consultant.

The inspection, sampling and analysis requirements in Table 3 apply to excavated material sourced from PS-105 (that is designated for use as capping).

8. Sequence of Remediation Works

The general sequence of remediation works for the encapsulation of contaminated soil at PS-105 shall be determined by the Contractor (CPBUI JV) and should consider the following sequence:

- The Contractor shall secure the site to ensure that all safety and environmental controls are implemented (see Section 14). All works associated with asbestos contaminated soil will be conducted by an Asbestos Contractor holding a Class A licence. SafeWork NSW is to be notified in writing at least five days before the licensed asbestos work commences. Monitoring for airborne asbestos fibres is to be carried out by a licensed Asbestos Assessor (Occupational Hygienist) during the excavation and placement of asbestos contaminated materials;
- A temporary stockpiling area(s) is to be established for the (temporary) storage of contaminated soils prior to incorporation into the mound. There is to be clear segregation of this area(s) from where uncontaminated soils are stockpiled;
- The location for the (final) placement of contaminated soil is to be inspected by a geotechnical engineer to confirm that geotechnical conditions are suitable for the placement and compaction of contaminated soil. If signs of potential contamination (e.g., staining, odours, potential asbestos containing materials, etc.) are observed during the inspection, the Environmental Consultant should be contacted to assess and provide advice for the possible contamination;
- The ground levels at the designated encapsulation area are to be surveyed (by a registered surveyor);
- The Contractor is to check that the contaminated soil (to be encapsulated at PS-105) has been assessed as suitable for the encapsulation at PS-105 by the Environmental Consultant (see Section 6);
- The contaminated soil is to be placed at the proposed encapsulation location (in a method that meets any geotechnical requirements). Dust control measures are to be utilised (see Section 14);
- The Contractor is to maintain a register of all soil placed for encapsulation (including, but not limited to, the contaminated soil source, stockpile identification, reference number of the environmental consultant report, date placed and location within the PS-105 Stockpile) which is to be forwarded to the Environmental Consultant or Site Auditor upon request;
- Where asbestos contaminated soil has been temporarily stockpiled outside of the area designated for encapsulation, the licenced Asbestos Assessor is to provide clearance for the removal of asbestos from the temporary stockpiling area. Where stockpiles of contaminated soil have been placed on bare soil, the footprint of stockpiles is to be validated through inspection, sampling and analysis by the Environmental Consultant (see Section 10.4);
- Following the completion of the placement of contaminated soil, the brightly coloured (e.g., orange) geo-textile barrier (marker layer) is to be placed to cover (the entirety of) the contaminated soil;

- The levels and extent of the marker layer are to be surveyed (by the registered surveyor);
- Soils that are deemed suitable by the Environmental Consultant (and, where required, meet the landscaping requirements) are to be placed to over the entire marker layer to complete the physical barrier (see Section 7 for the physical barrier requirements). (The Contractor is to check that the capping soil has been assessed as suitable for the encapsulation at PS-105 by the Environmental Consultant prior to placement). The Environmental Consultant is to conduct periodic inspections of the placement of soil as capping. The Contractor is to maintain a register of all soil used as part for the capping (including, but not limited to, stockpile/soil identification, reference number of the environmental consultant report, date placed and location at the PS-105 Stockpile) which is to be forwarded to the Environmental Consultant or Site Auditor upon request;
- Where the thickness of capping soil is to exceed 2 m, the levels and extent of the top of placed untested capping soil (see Table 3, Section 7.2) is to be surveyed (by a registered surveyor) prior to the placement of the tested soil (see Table 3, Section 7.2) designated for used in the top 2 m;
- The levels and extent of the final landform (i.e., top of cover) are to be surveyed. (Additional soil may need to be placed where the thickness of the capping layer does not meet the required minimum thickness). The landform is to be surveyed (by a registered surveyor) following placement of any additional clean soil; and
- Seeding and placement of site-won rocks and logs / stumps in a manner that does not reduce the thickness of clean fill cover.

If (unexpected) signs of contamination (e.g., odours, potential ACM, etc) are observed in the (assessed) 'clean' capping soil during excavation or placement of the material, the soil showing signs of contamination is to be segregated or kept separate from other clean material and the Environmental Consultant is to conduct an assessment (including inspection, sampling and analysis) of the material showing signs of contamination. The Environmental Consultant will provide advice as to the suitability of the assessed material to be used at PS-105.

9. Acceptance Criteria

The overarching remediation acceptance criterion (RAC) to be adopted is for 'no unacceptable risks posed by the relevant media (i.e., soils) to human health or the environment'.

The RAC is for the encapsulation remediation strategy is:

- The cover (cap) must meet the minimum nominated thickness of 0.5 m over a geotextile barrier layer.

The remediation works are to be validated as meeting the RAC by the Environmental Consultant by means of visual inspection, recovery and analysis of samples (if required) and review of survey plans.

Where the soil at the footprints of stockpiles of contaminated soil have been sampled (following their excavation and removal) and analysed, the RAC are:

- No asbestos present (from observations or in analysed soil samples); and

- Contaminants of concern for the stockpile (if any other than asbestos) within health and ecological criteria for a public open space land use (land use category C) sourced from NEPC (2023), CRC Care (2010) and HEPA (2020).

Acceptance criteria / requirements for contaminated soil that is to be encapsulated are presented in Section 6.

Acceptance criteria / requirements for clean fill for the physical barrier (capping) are presented in Section 7.

Acceptance criteria / requirements associated with the validation of other imported soils (if required) are presented in Section 11.

10. Validation Plan

10.1 Data Quality Objectives

The data quality objectives (DQO) for the validation plan are included in Appendix C.

10.2 Validation Assessment Requirements

The following validation work will be required:

- Review of the reports pertaining to the characterisation of contaminated material which is proposed to be encapsulated at PS-105, and the reports pertaining to proposed capping material and other imported material;
- Field assessment by the Environmental Consultant comprising:
 - o Visual inspections of the encapsulation works, including taking photographs for record purposes;
 - o Collecting validation samples from contaminated stockpile footprints;
 - o Inspection and collection of validation samples for the encapsulation cover material (see Section 7.2); and
 - o Possible inspection and collection of samples of contaminated stockpiles for stockpile characterisation.
- Surveying by the Surveyor comprising:
 - o Survey of the ground levels prior to placement of the contaminated soil;
 - o Survey of the extent and levels of the top of the marker layer;
 - o Survey of the extent and levels of the top of untested capping soil (that is placed at a depth of more than 2 m below the final landform level); and
 - o Survey of the extent and levels of the top of the physical barrier (final land form levels).
- Laboratory analysis of soil samples at a NATA accredited laboratory for the contaminants of concern or potential concern;

- Comparison by the Environmental Consultant of the survey results and laboratory results with the assessment criteria;
- Review of clearance inspection reports (prepared by the Occupational Hygienist) by the Environmental Consultant;
- Review of supporting documentation from the Contractor (see Section 15.1); and
- Preparation by the Environmental Consultant of a validation report detailing the methods and results of the remediation works and validation assessment.

10.3 Characterisation of Stockpiles for Encapsulation

Where a review of reports indicates that contaminated soil has not been adequately characterised, sampling and analysis for characterisation of contaminated stockpiles may need to be undertaken by the Environmental Consultant in order to confirm (or otherwise) that the material is suitable to be encapsulated at PS-105.

According to NSW EPA, *Sampling Design Part 1 - application, Contaminated Land Guidelines*, 2022 (NSW EPA, 2022) for stockpiles comprising similar materials and a:

- Volume up to 200 m³: a recommended minimum frequency of one sample per 25 m³, with a minimum of three samples per stockpile is to be adopted; and
- Volume greater than 200 m³: a recommended minimum frequency of one sample per 25 m³, with a minimum of 12 samples OR a minimum of 10 samples and calculation of the 95% upper confidence limit of the arithmetic mean for all applicable analytes is to be adopted.

The above sample frequencies apply to chemical contaminants (i.e., not for asbestos). Where asbestos has been identified as a contaminant in a stockpile, further sampling and analysis for asbestos is not required (for the purpose of assessing suitability for encapsulation). Previous sampling data may be used for determining the total sample density (e.g., for a stockpile of 200 m³, a minimum of three samples are to be collected in the case that five samples have previously been collected and tested from the stockpile). Samples are to be analysed for chemical contaminants of potential concern associated with the stockpile source location and its historical land use.

10.4 Temporary Stockpile Area Footprint Sampling Frequency

Where contaminated soils are temporarily stockpiled on bare soils outside of the area to be encapsulated, the footprint of the stockpiles will require validation following removal of the contaminated soils. The sampling frequency will be one sample per 25 m² on a general grid pattern across the stockpile's footprint. Where asbestos is the contaminants of concern, samples will comprise 500 mL soil samples which will be analysed for asbestos. Where fill is observed at the footprint, 10 L bulk samples will be collected for onsite screening/sieving for asbestos as per the method described in NEPC (2013). Samples will be analysed for other contaminants of concern associated with the stockpiled material.

Where contamination is identified from sampling and analysis, excavation of the area and subsequent validation sampling and analysis will be required. This process will continue until the impacted material has been fully chased out (by excavation).

11. Other Imported Material

Sections 6 and 7 describe the requirements for soil to be encapsulated and soil to be used as part of the physical barrier (capping). The inspection, sampling and analysis requirements in Section 7.2 (including for material imported to SCAW, and for material sourced from SCAW and to be used below the top 2 m of capping in Table 3) are to apply to imported materials that are used for other purposes (e.g., materials used for temporary purposes) at the PS-105 site. At the time of preparing this RAP, it is not known if any such material is required to facilitate the remedial works.

12. Waste Removal & Disposal of Contaminated Soil (Contingency)

Although disposal of contaminated material is not part of the proposed remediation works, it is possible that contaminated soil may need to be disposed offsite (e.g., in the case that highly contaminated soil / leachable contaminants in soil is identified, the total volume of contaminated soil cannot be encapsulated, etc).

Disposal of waste (outside of the SCAW project area) must be to an appropriately licensed waste facility, as per POEO Act and the *Protection of the Environment (Waste) Regulation 2014* NSW. Any waste disposed outside of the SCAW project area must be initially classified (in a report) by the Environmental Consultant in accordance with:

- NSW EPA *Waste Classification Guidelines, Part 1: Classifying Waste* (NSW EPA, 2014a);
- NSW EPA *Waste Classification Guidelines, Part 2: Immobilisation of Waste* (NSW EPA, 2014b); and
- NSW EPA *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste* (NSW EPA, 2016) [addendum for per- and poly-fluoroalkyl substances (PFAS)].

The suggested sampling frequency for contaminants of potential concern other than asbestos, sourced from NSW EPA (2022)¹, for the initial assessment of stockpiles comprising similar materials shall be:

- For stockpiles up to 200 m³: one sample per 25 m³, with a minimum of three per stockpile;
- For stockpiles of 200 m³ to 2500 m³: a minimum of 10 samples for application of statistics; and
- For stockpiles of greater than 2500 m³: one sample per 250 m³ or part thereof.

¹ The sampling densities sourced from NSW EPA (2022) are also presented in Table 2 and Table 3 of EPA Victoria, *Industrial Waste Resource Guidelines*, 2009.

Where asbestos is suspected of being present (but not known) the following sample densities are required for asbestos:

- For disposal to a licensed landfill: three samples for stockpiles less than 75 m³, plus one sample for every additional 75 m³.

Samples are to be analysed for contaminants of potential concern based on the source location history. Typically, samples will be analysed for eight priority metals, PAH, TRH, BTEX, OPP, OCP, PCB and asbestos (although the analytical suite may need to be expanded for other potential contaminants e.g., PFAS, phenols, etc). (It is noted that the sampling and analysis may have been undertaken as part of characterisation testing).

All waste must be tracked by the Contractor from 'cradle to grave'. Copies of all consignment notes / disposal dockets (or similar) and Environment Protection Licences for receipt and disposal of the materials must be maintained by the Contractor as part of the site log and must be provided to the Environmental Consultant for inclusion in the validation report.

13. Quality Assurance and Quality Control

The data quality objectives (DQO) for the validation plan are included in Appendix C.

Samples analysed for asbestos will not be subject to inter-laboratory or intra-laboratory replicate analysis. To avoid the need for decontamination, samples for asbestos analysis will be collected using disposable nitrile gloves, changed for the collection of each sample.

For analysis of chemical contaminants (i.e., excluding asbestos analysis), field quality assurance and quality control (QA / QC) testing will include the following:

- 10% replicate sample analysis (20% in the case of PFAS);
- Rinsate samples (where re-useable sampling equipment is used), analysed for the suite of analytes analysed by most of the primary samples; and
- Trip spike and trip blank samples (analysed for BTEX) (approximately one per batch of samples) where volatile organic compounds are considered to be a contaminant.

The laboratory will undertake analysis in accordance with its NATA accreditation, including in-house QA / QC procedures.

The field QC analytical results will be assessed using the following criteria:

- Sampling location rationale met the sampling objective;
- Standard operating procedures (SOP) are followed;
- Appropriate QA / QC samples are collected / prepared and analysed;
- Samples are stored under secure, temperature-controlled conditions;
- Chain of custody documentation is employed for the handling, transport and delivery of samples to the selected laboratory;

- Conformance with specified holding times;
- Field replicate samples will have a precision average of 30% relative percentage difference (RPD); and
- Rinsate samples will show that the sampling equipment (if used) is free of introduced contaminants, i.e., the analytes show that the rinsate sample is within the normal range for demineralised water.

Limits for laboratory QA / QC samples will depend on the laboratories' internal QA / QC system. Typical laboratory limits for laboratory QA / QC samples are as follows:

- Blank: less than the PQL;
- Duplicate: for $>10 \times$ PQL, the RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range of 20 - 50%;
- Matrix Spike: generally, 70-130% recovery for inorganics/metals and 60-140% recovery for organics;
- Laboratory Control Sample (LCS): generally 70-130% recovery for inorganics/metals and 60-140% recovery for organics; and
- Surrogate Spike: generally 70-130% recovery for inorganics/metals and 60-140% recovery for organics.

Field and laboratory test may be considered useable for the validation assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the 'true' value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

14. Management and Responsibilities

14.1 Site Management Plan

A general site management plan for the operational phase of site remediation is included in Appendix D. The management plan includes soil, noise, dust, work health safety (WHS), remediation schedule, hours of operation and incident response which are to be implemented for the duration of the remedial works.

Site management is to be in accordance with the Environment Protection Licence (21695).

14.2 Site Responsibilities

The site management plan (Appendix D) provides a summary of the general program management and associated responsibilities.

15. Validation Reporting

15.1 Documentation

The following documents will need to be collated and reviewed by the Environmental Consultant as part of the validation assessment (including those items that are prepared by the Environmental Consultant):

- Any licences and approvals required for the remediation works (Contractor);
- Soil inspection reports and soil characterisation reports (with respect to soil contaminants) (Environmental Consultant and Contractor);
- Waste classification reports (if applicable) (Environmental Consultant and Contractor);
- Transportation Record: comprising a record of all truckloads of soil (including aggregate) entering the site, including truck identification (e.g., registration number), date, time, source site, load characteristics (e.g., type of material, i.e., quarried aggregate, etc.), approximate volume, and use (Contractor);
- Disposal dockets: for any soil disposed off-site. The Contractor will supply records of transportation records, spoil source, spoil disposal location, and receipt provided by the receiving waste facility / site;
- Imported materials records: records for any soil imported onto the site, including source site, classification reports, inspection records of soil upon receipt at site and transportation records (Contractor);
- Records relating to contingency plans implemented (Contractor);
- Laboratory certificates and chain-of-custody documentation (Environmental Consultant);
- Inspections records from the Environmental Consultant;
- Photographic records by all contractors and consultants of the works undertaken within their purview of responsibilities;
- Surveys of the initial ground level, geotextile marker layer and final land form (Contractor and Surveyor);
- Airborne asbestos monitoring records (in the event that asbestos works are undertaken) (Occupational Hygienist and Contractor); and
- Interim / final visual and sampling clearances for any asbestos related works (Occupational Hygienist and Contractor).

It is noted that field and photographic records will be used as information for the site audit.

15.2 Reporting

During the progress of the remediation works, the Environmental Consultant is to issue reports (or memorandums) to the Contractor for soil materials that have been inspected and assessed (as being suitable for encapsulation, for capping or for other purposes). These reports (or memorandums) are to be made available to the Site Auditor upon request.

A validation assessment report will be prepared by the Environmental Consultant in accordance with NSW EPA (2020). The validation report shall describe the remediation approach adopted, methodology, results and conclusion of the assessment and make a statement regarding the suitability of the site for its future use.

Following completion of the validation report, a long-term EMP will need to be prepared. The EMP will document the (legally enforceable) requirements for monitoring and maintenance of the physical barrier, as well as (legally enforceable) requirements for works that penetrate the physical barrier.

16. Conclusions

With implementation of this RAP (and future EMP), it is considered that asbestos contaminated soil can be encapsulated at the PS-105 site and be made suitable for the intended future land use (i.e., a publicly accessible landscaped area).

Any updates / revisions to design plans for the PS-105 Stockpile should be forwarded to the Environmental Consultant and Site Auditor for review and approval prior to commencement of works at PS-105.

17. References

CRC CARE. (2019a). *Remediation Action Plan: Development - Guideline on Establishing Remediation Objectives*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

CRC CARE. (2019b). *Remediation Action Plan: Development - Guideline on Performing Remediation Options Assessment*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW DUAP/EPA. (1998). *Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land*. NSW Department of Urban Affairs and Planning / Environment Protection Authority.

NSW EPA. (2014a). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2014b). *Waste Classification Guidelines, Part 2: Immobilisation of Waste*. NSW Environment Protection Authority.

NSW EPA. (2014c). *Waste Classification Guidelines, Part 4: Acid Sulfate Soils*. NSW Environment Protection Authority.

NSW EPA. (2014d). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014*. NSW Environment Protection Authority.

NSW EPA. (2016). *Addendum to the Waste Classification Guidelines (2014) - Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation*. NSW Environment Protection Authority.

18. Limitations

Douglas Partners (DP) has prepared this RAP for the SCAW project for SMWSA. The work was carried out under a Services Contract. This RAP is provided for the exclusive use of CPBUI JV for this project only and for the purposes as described in the RAP. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this RAP beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this RAP, DP has necessarily relied upon information provided by the client and / or their agents.

DP's advice is based upon the conditions encountered during the previous investigations. The accuracy of the advice provided by DP in this RAP may be affected by undetected variations in ground conditions across the site between and beyond the sampling and / or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the (environmental) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this RAP and requires additional project data and assessment.

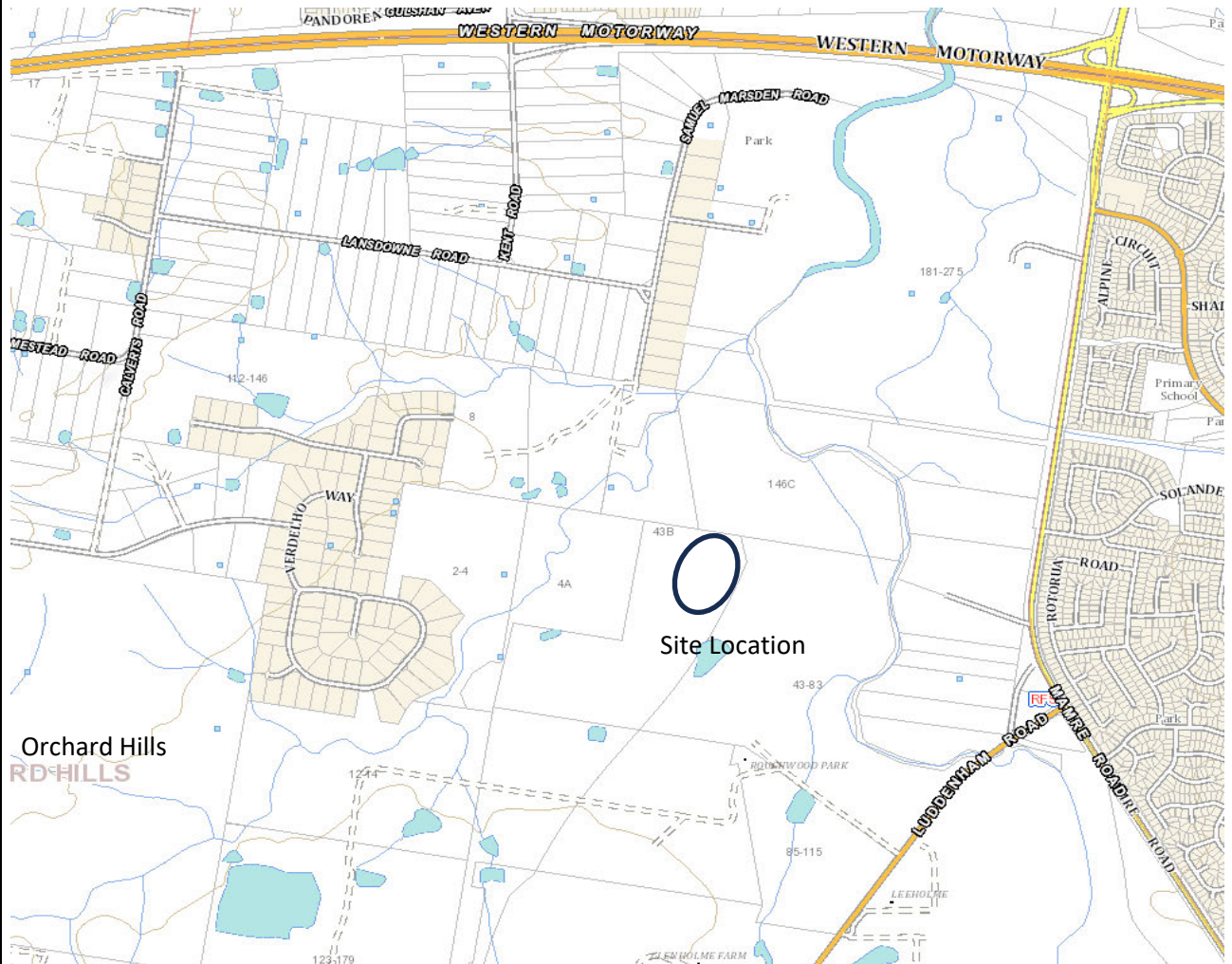
This RAP must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this RAP.

This RAP, or sections from this RAP, should not be used as part of a specification for a project, without review and agreement by DP. This is because this RAP has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

Drawing



Site Locality Plan
Stockpile PS-105
Luddenham Road, Orchard Hills

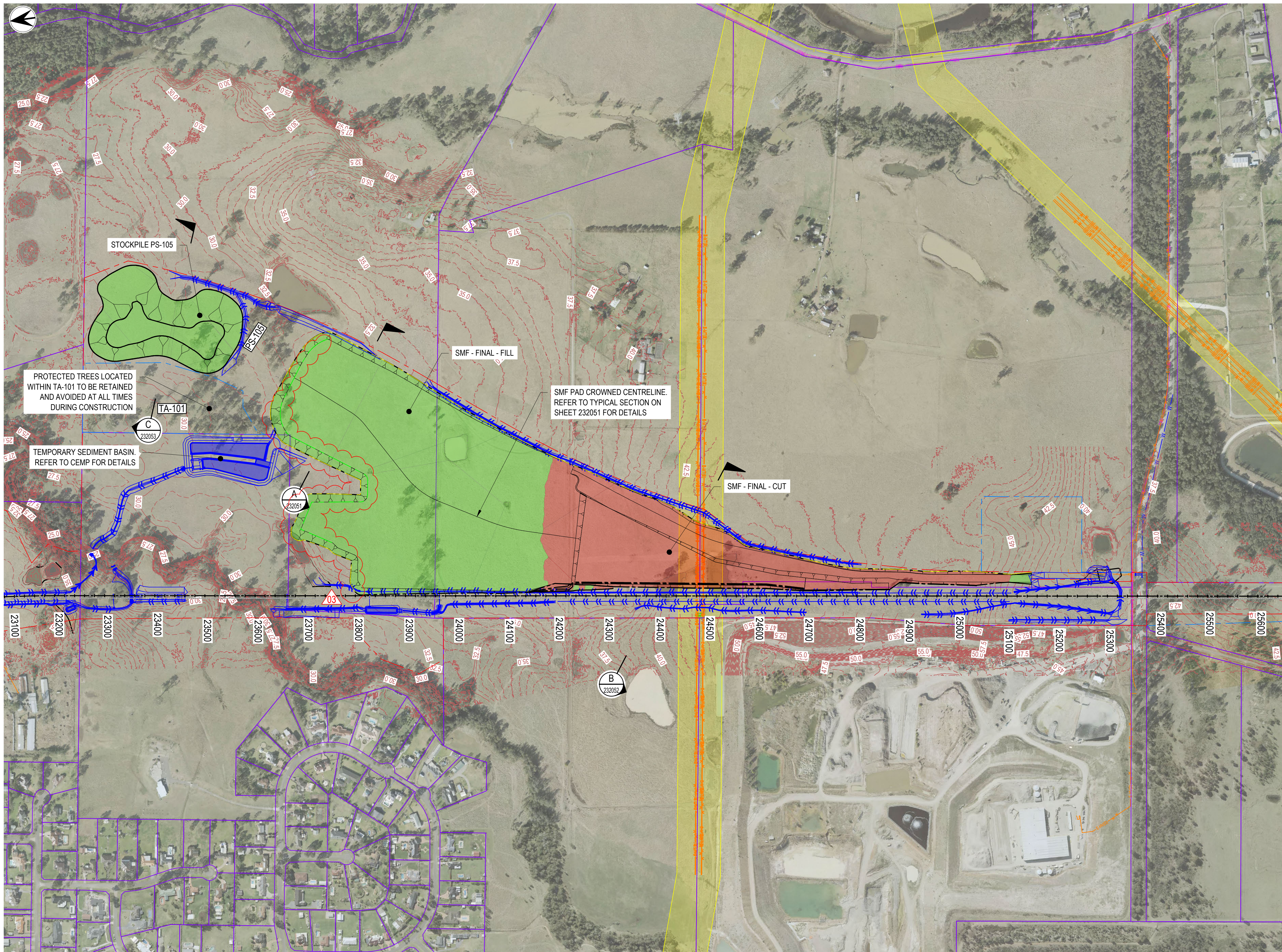
CLIENT: CPBUI JV

PROJECT: 204814.01

DWG No: 1

REV: 0

DATE: 18-Dec-23



GENERAL ARRANGEMENT PLAN
SCALE 1:4000

LEGEND

GENERAL

- CADASTRAL BOUNDARIES
- EXISTING MAJOR CONTOURS SHOWN AT 2.5m INTERVALS
- EXISTING MINOR CONTOURS SHOWN AT 0.5m INTERVALS
- PROPOSED TRACK FORMATION DESIGN (AS PART OF PWA FORMATION PACKAGE - SCATR2220)
- MAIN LINE TRACKS (TRACK AND SLAB DESIGN BY SSTOM CONTRACTOR)
- SCAW PROJECT BOUNDARY
- TEMPORARY BOUNDARY FOR CONSTRUCTION
- SMF SET-OUT BOUNDARY
- REQUIRED TOP OF EMBANKMENT
- RAIL MAIN ALIGNMENT
- DESIGN CUTTING
- DESIGN FILLING
- TRANSGRID EASEMENT

DRAINAGE (REFER TO PACKAGES SCASD2410 AND SCASD2420)

- DRAINAGE CULVERT
- DRAINAGE PIPE WITH PIT AND HEADWALL
- DRAINAGE GRASS CHANNEL
- DRAINAGE ROCK CHANNEL
- DRAINAGE BIO-FILTRATION CHANNEL
- DRAINAGE BASIN
- DRAINAGE RIPRAP

NOTES

- FOR UTILITIES LEGEND REFER TO DRAWING No. SMWSASCA-CPU-OHE-SF153-EW-DRG-232011
- FOR UTILITIES SET REFER TO DRAWINGS SERIES EW000-UT-DRG-SCAUU5000 PACKAGE

FOR CONSTRUCTION

REV.	AMENDMENT DESCRIPTION	Design by	Verified by	Approved by	Date
03	RE-ISSUED FOR CONSTRUCTION	P.S.	T.W.	R.M.	13.07.23
02	RE-ISSUED FOR CONSTRUCTION	P.S.	T.W.	R.M.	20.06.23
01	RE-ISSUED FOR CONSTRUCTION	P.S.	T.W.	R.M.	25.04.23
00	ISSUED FOR CONSTRUCTION	P.S.	T.W.	R.M.	22.02.23

SCALE: 1:4000
40 0 80 160m
SCALE 1:4000

NOTE: Do not scale from this drawing.

CLIENT:

NSW GOVERNMENT | sydney METRO

NAS: 131479 / IC: SMWSASCA-SKB-SWD-CV-CER-232001

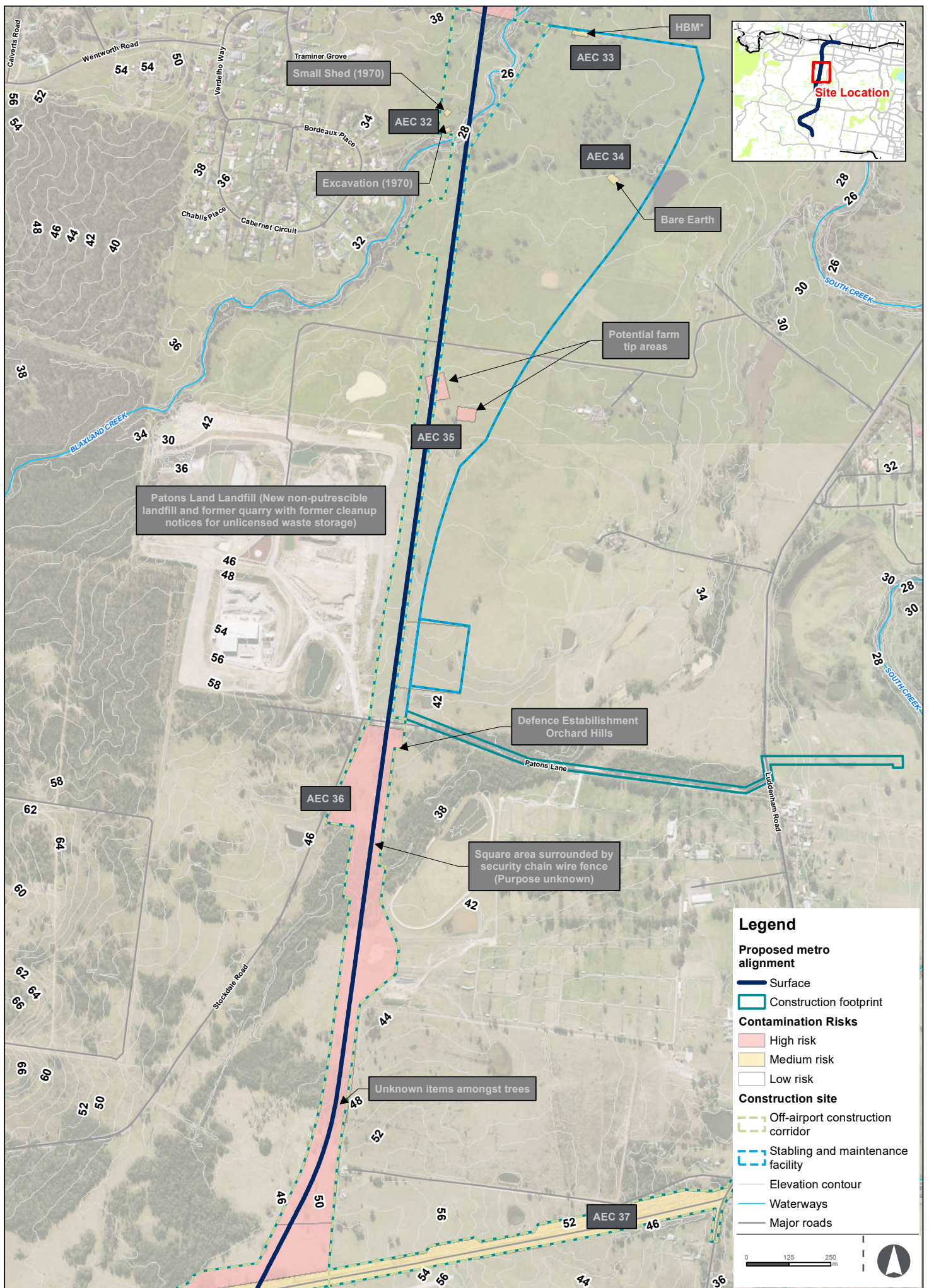
The information shown on this drawing is for the purposes of the Sydney Metro Project only. No warranty is given or implied as to its suitability for any other purpose. The Service Providers accept no liability arising from the use of this drawing and the information shown thereon for any purpose other than the Sydney Metro Project.

CPB CONTRACTORS | UNITED INFRASTRUCTURE | COX WOODS BAGOT

DESIGNED: ANTHONY VIZL 13.07.2023
DRG CHECK: LUBOS AVUK 13.07.2023
DESIGN CHECK: TIM WALTON 13.07.2023
APPROVED: ROB MUNRO 13.07.2023

SYDNEY METRO WESTERN SYDNEY AIRPORT
SURFACE AND CIVIL ALIGNMENT WORKS
CIVIL
SCAEW2320 SCAW STABLING AND MAINTENANCE FACILITY FINAL PACKAGE
GENERAL ARRANGEMENT PLAN

FILE No: SHEET: 1 OF 1
STATUS: FOR CONSTRUCTION EDMS No:
DRG No: SMWSASCA-CPU-OHE-SF153-EW-DRG-232081
REV 03 VER



Stabling and maintenance facility and off-airport construction corridor in Orchard Hills contamination sources and risk ranking

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

Figure A8

Appendix B

Notes About this Report

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix C

Data Quality Objectives

Data Quality Objectives

RAP for PS-105, Luddenham Road, Orchard Hills

SCAW Package for SMWSA

1. Introduction

The objective of the validation plan is to assess whether the physical barrier (capping layer) has been constructed in accordance with the RAP, assess the resultant suitability of the PS-105 site for the intended land use, and to provide information on any environmental impacts which may have resulted from the works.

The validation assessment will be conducted with reference to the seven step data quality objectives (DQOs) as outlined in NEPC (2013), described below. The DQO in NEPC (2013) is in turn, based on the DQO process outlined in USEPA (2006), and associated guidelines.

2. Data Quality Objectives

Table 1: Data Quality Objectives

Step	Summary
1: State the problem	The objective of the validation plan is to confirm successful implementation of this remediation action plan. A conceptual site model (CSM) for the proposed development has been prepared in the RAP.
2: Identify the decisions / goal of the study	The decisions to be established include: • Whether the contaminated material is considered suitable for encapsulation; • The physical barrier (capping layer including marker layer) has been placed in general accordance with the RAP; and • Whether the PS-105 site is suitable for the future land use. Asbestos is the key contaminant with respect to encapsulation (as identified in the CSM).
3: Identify the information inputs	Relevant inputs to the decision include: • The CSM; • Sample analysis using NATA accredited laboratories and methods, where possible; • Field and laboratory QA/QC data to assess the suitability of the environmental data for the validation assessment; • Results compared with generic health and ecological criteria as stated in this RAP; • Inspections of the marker layer prior to placement of the clean soil cover;

Step	Summary
	- Assessments of soil, imported for use as the physical barrier; - Inspections of the physical barrier (capping); - Review of the survey of the installed physical barrier (capping); - The need for an enforceable long term environmental management plan (LTEMP); and - Landscaping plans for PS-105.
4: Define the study boundaries	The extent of the encapsulation area at PS-105 is to be determined. The RAP is for the encapsulation area and any associated temporary stockpiling area at PS-105 for contaminated soil. The location of PS-105 is shown in Appendix A of the RAP.
5: Develop the analytical approach (or decision rule)	The decision rule is the construction of the physical barrier to at least the minimum thickness included in Section 7 of the RAP. Analytical results are to be compared to generic health and ecological criteria as stated in this RAP. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field and laboratory duplicate results for chemical analysis, RPDs should generally be below 30%; for field blanks, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Section 13.
6: Specify the performance or acceptance criteria	Baseline condition 1: The capping has not been constructed in accordance with this RAP (null hypothesis); Alternative condition 1: The capping has been constructed in accordance with this RAP (alternative hypothesis). Baseline condition 2: Contaminants in soil (and/or statistical analysis of data) pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition 3: Contaminants in soil (and/or statistical analysis of data) do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.
7: Optimise the design for obtaining data	Sampling design and procedures to be implemented to optimise data collection for achieving the DQOs include the following: - Sampling frequencies in accordance with Sections 10, 11 and 12 of the RAP; - Analysis for the CoPC at NATA accredited laboratories using NATA endorsed methods will be used to perform laboratory analysis whenever possible; - Adequately experienced environmental scientists/engineers will conduct field work and sample analysis interpretation; - Visual inspections of the physical barrier construction by the Environmental Consultant in accordance (as per with Section 10 of the RAP); and - Registered surveys of the physical barrier in accordance with Sections 8 and 10 of the RAP.

3. References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

USEPA. (2006). *Guidance on systematic planning using the data quality objectives process, EPA QA/G-4*. Washington DC.: United States Environmental Protection Agency, Office of Environmental Information.

Douglas Partners Pty Ltd

Appendix D

Site Management Plan

Site Management Plan

RAP for PS-105, Luddenham Road, Orchard Hills

SCAW Package for SMWSA

1. Introduction

This general site management plan (SMP) has been developed to minimise potentially adverse impacts on the environment, and worker and public health as a result of the proposed remediation works.

The following construction environment management plan (CEMP) has been prepared for the project:

- CPBUI JV, *Construction Environment Management Plan (CEMP), Main Excavation and Viaduct Works, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, Document SMWSASCA-CPU-1NL-NL000-EV-PLN-000001.

The CEMP is an overarching document that references a series of management plans and sub-plans (some of which are referenced in this document). This SMP has been prepared to present general details for aspects of the remedial work, as per reporting requirements for a remediation action plan (RAP) under NSW EPA, *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020) to complement the CEMP and associated management plans and sub-plans.

Works are to comply with the Environment Protection Licence (21695) for the SCAW project.

Apart from the management principles outlined in this SMP, the Contractor must also ensure compliance with all relevant environmental legislation and regulations, including (but not limited to) the following:

- *Contaminated Land Management Act 1997* NSW (CLM Act);
- *Protection of the Environment Operations Act 1997* NSW (POEO Act);
- *Protection of the Environment Legislation Amendment Act 2011* NSW;
- *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008* NSW;
- *Environmentally Hazardous Chemicals Act 1985* NSW;
- *Environmental Offences and Penalties Act 1989* NSW;
- *Pesticide Act 1999* NSW and *Pesticides Regulation 2017*; and
- *Work Health and Safety Act 2011* NDSW (WHS Act) and *Work Health and Safety Regulations 2011* NSW.

2. Roles and Responsibilities

With respect to contaminated land management at the site, Sydney Metro (SM) is the Principal, CPBUI JV is the Principal Contractor; and Melissa Porter (of Senversa) is the Site Auditor accredited by NSW EPA under the CLM Act.

The Principal will retain the overall responsibility for ensuring this RAP is appropriately implemented, however, the actual implementation of the RAP will be conducted by the Principal Contractor. Roles and responsibilities for implementing this RAP are discussed below.

2.1 Principal Contractor

The Principal Contractor ('the Contractor') will be the party responsible for daily implementation of this RAP and shall fulfil the responsibilities of the Contractor as defined by SafeWork NSW. It is noted that the Contractor may appoint appropriately qualified sub-contractors or sub-consultants to assist in fulfilling the requirements of the procedures. The Contractor will appoint a Site Manager(s) and/or a Site Supervisor(s).

In addition to the implementation of the RAP it will be the Contractors responsibility to:

- Obtain / ensure relevant sub-contractors obtain specific related approvals as necessary to implement the earthworks including permits for removal of asbestos-containing material, SafeWork NSW notification etc.;
- Develop or request and review any site plans to manage the works to be conducted;
- Ensure that all remediation works and other related activities are undertaken in accordance with this RAP;
- Maintain all site records related to the implementation of this RAP (i.e., soil transportation records, records relating to contingency plans, photographic records, stockpiling records, records of site activities, etc);
- Ensure sufficient information is provided to engage or direct all required parties, including sub-contractors, to implement the requirements of the RAP other than those that are the direct responsibility of the Contractor;
- Manage the implementation of any recommendation made by those parties in relation to work undertaken in accordance with the RAP;
- Inform, if appropriate, the relevant regulatory authorities of any non-conformances with the procedures and requirements of the RAP in accordance with the procedures outlined in this document;
- Retain records of any contingency actions;
- On completion of the project, to review the RAP records for completeness and update as necessary; and
- Recommend any modification to general documentation which would further improve the environmental outcomes of this RAP.

The Principal Contractor will be responsible for ensuring the contamination testing and management is carried out in accordance with the Environment Protection Licence (21695).

2.2 Surveyor

The project surveyor will be a registered surveyor engaged by the Contractor to undertake surveying works as required by this RAP.

2.3 Asbestos Contractor

The Asbestos Contractor will be responsible for undertaking all asbestos work involving any asbestos impacted soil and will hold the appropriate licence for the removal of asbestos (issued by SafeWork NSW). As there is expected to be friable asbestos contaminated soil requiring encapsulation, a Class A licence will be required for the work involving asbestos contaminated soil.

The Asbestos Contractor can be the same entity as the Principal Contractor.

2.4 Sub-contractors

All sub-contractors will be inducted onto the site, informed of their responsibilities in relation to this RAP and sign their agreement to abide by the RAP requirements. Where necessary, sub-contractors will also be trained in accordance with the requirements of this document. All sub-contractors must conduct their operations in accordance with the RAP as well as all applicable regulatory requirements.

2.5 Environmental Consultant

The Environmental Consultant will provide advice on implementing the RAP. The Environmental Consultant will be responsible for:

- Undertaking any required assessments where applicable (e.g., waste classification, validation, etc.);
- Providing advice and recommendations arising from monitoring and/or inspections, including unexpected finds; and
- Notifying (the client of) any results of assessments, and any observed non-conformances.

2.6 Occupational Hygienist

The Occupational Hygienist will be required to be engaged independently of the Asbestos Contractor to undertake the following:

- Review and approve documentation prepared by the Asbestos Contractor;
- Prepare any WHS plans and advice required by the Contractor;

- Undertake airborne asbestos monitoring;
- Undertake clearance inspections;
- Provide advice and recommendations arising from monitoring and / or inspections; and
- Notify (the client of) results of any assessments and any observed non-conformances.

The Occupational Hygienist will be a licensed Asbestos Assessor for friable asbestos removal work.

2.7 Site Workers

All workers on the site are responsible for observing the requirements of this RAP and other management plans. These responsibilities include the following:

- Being inducted on the site and advised of the general nature of the remediation/environmental issues at the site;
- Being aware of the requirements of this plan;
- Wearing appropriate personal protective equipment (PPE);
- Only entering restricted areas when permitted; and
- Requesting clarification when unclear of requirements of this or any other plans (e.g., safe work method statements (SWMS)).

3. Stormwater Management

Stormwater must be managed during the remediation works such that potential adverse impacts from surface runoff (e.g., cross contamination, mobilisation of contaminants in soil particles, etc.) are appropriately mitigated. Discharges of water must be in accordance with the Environment Protection Licence (21695).

The Contractor will take appropriate measures which may include:

- Construction, where necessary, of stormwater diversion channels, bunding and linear drainage sumps with catch pits in and around the remedial works\ areas to divert stormwater from the contaminated areas;
- Provision of appropriately located sediment traps including geotextiles; and
- Discharge of excess water in low points on a regular basis to limit the potential for flooding.

Where water is not suitable for discharge to the stormwater system, a liquid waste contractor may be required to remove the water for disposal in accordance with regulatory requirements.

4. Soil Management Plan

With regard to soil management and transport, the following plans have been prepared for the SCAW project:

- CPBUI JV, *Spoil Management Plan, Western Sydney Airport Surface and Civil Alignment Works*, Revision 1, 29 September 2022, Document SMWSASCA-CPU-1NL-NL000-SM-PLN-000001;
- CPBUI JV, *Soil and Water Management Sub-plan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, 4 November 2022, Document SMWSASCAA-CPU-1NL-NL000-WA-PLN-000001;
- CPBUI JV, *Waste Management Sub-plan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, SMWSASCA-CPU-1NL-NL000-WM-PLN-000001;
- Tetra Tech Coffey Pty Ltd, *Asbestos Management Plan (AMP) for Sydney Metro Western Sydney Airport Surface and Civil Alignment Works (SCAW)*;
- CPBUI JV, *Overarching Construction Traffic Management Plan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, 29 September 2022, Document SMWSASCA-CPU-1NL-NL000-TF-PLN-000001;
- CPBUI JV, *Construction Traffic Management Plan – Elizabeth Drive Gate 6, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, 17 October 2022, Document SMWSASCA-CPU-1NL-NL000-TF-PLN-000006;
- CPBUI JV, *Construction Traffic Management Plan, Patons Lane – Gate 2, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1 28 September 2022, Document SMWSASCA-CPU-1NL-NL000-TF-PLN-000003; and
- CPBUI JV, *Construction Traffic Management Plan – Luddenham Road Gate 3, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, Document SMWSASCA-CPU-1NL-NL000-TF-PLN-000004.

Appendix C5 of the *Soil and Water Management Sub-plan* includes a *Contaminated Land and Asbestos Finds Procedure*.

4.1 Excavation and Stockpiling of Contaminated Material

The Contractor is to mitigate cross contamination throughout the works. Contaminated material shall be stockpiled at a suitably segregated location(s) away from sensitive areas (e.g., water bodies, drainage lines, stormwater pits, etc.) and ongoing excavations, and in a manner that will not cause nuisance to the neighbouring land. Soil stockpiles are to be managed as follows:

- An impermeable membrane such as plastic sheeting should be provided at the surface by the Contractor prior to stockpiling. Plastic sheeting should be taped at joins, as necessary;
- All stockpiles of contaminated material shall be surrounded by star pickets and marking tape or other suitable material to clearly delineate their boundaries;
- Stockpiles shall be lightly conditioned by sprinkler or covered by geotextile or similar cover to prevent dust generation;
- Stockpiles impacted, or potentially impacted, with asbestos must be covered by geotextile;

- Any stockpile to remain on-site overnight should be adequately secured in order to reduce the risk of sediment runoff;
- Measures should be taken by the Contractor to prevent the migration of stockpile materials (i.e., perimeter bunds, hay bales, silt fences, etc.);
- Should the stockpile remain on-site for over 24 hours, geotextile silt fences must be erected to prevent losses by surface erosion; and
- A record of stockpile locations (stockpile register), dimensions, descriptions, environmental controls, etc. should be maintained by the Contractor.

All movement of soil within the site and off-site is to be tracked by the Contractor, from cradle to grave. Stockpiles kept on site are to be clearly labelled (pegged or spray painted on geofabric) and a site record is to be kept including the source location of each stockpile and the position of each stockpile (with associated dates). Copies of tracking records must be provided to the Environmental Consultant upon request.

4.2 Loading and Transport of Contaminated Material

Transport of contaminated material from the site (if required) shall be via a clearly delineated haul route and this route shall be used exclusively for entry and egress of vehicles used to transport contaminated materials within and away from the site. The proposed waste transport route (to be determined by the Contractor) will be notified to Council and truck dispatch shall be logged and recorded by the Contractor for each load leaving the site. A record of the truck dispatch will be provided to the Environmental Consultant.

All haulage routes for trucks transporting soil, materials, equipment or machinery to and from the site should be selected to meet the following objectives:

- Comply with all road traffic rules;
- Minimise noise, vibration and dust to adjacent premises; and
- Utilise State roads and minimise use of local roads as far as practicable.

The remediation work will be conducted such that all vehicles:

- Conduct deliveries of soil, materials, equipment or machinery only during the specified hours of remediation;
- Have securely covered loads to prevent any dust or odour emissions during transportation; and
- Exit the site in a forward direction.

In addition, measures will be implemented to ensure no contaminated material is spilled onto public roadways or tracked off-site on vehicle wheels. Roadways will be kept clean throughout the remediation works and will be broomed, if necessary, to achieve a clean environment.

All loads will be securely covered and may be lightly wetted, if required, to ensure that no materials or dust are dropped or deposited outside or within the site. Prior to exiting the site each truck should be inspected by Contractor personnel and either noted as clean (wheels and chassis) or broomed prior to leaving the site. Any soil spilled onto surrounding streets will be cleaned by mechanical or hand methods, on a daily basis.

Removal of waste materials from the site shall only be carried out by contractors holding the appropriate license(s), consent or approvals to dispose the waste materials according to the waste classification and with the appropriate approvals obtained from the EPA, were required.

5. Noise and Vibration Control Plan

All equipment and machinery should be operated in an efficient manner to minimise the emission of noise. The use of any plant and/or machinery should not cause unacceptable vibrations to nearby properties. The following noise and vibration control plan has been prepared for the project:

- CPBUI JV, *Noise and Vibration Management Sub-plan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, 4 November 2022, Document SMWSASCA-CPU-1NL-NL000-NV-PLN-000001.

6. Dust Control Plan

Dust emissions must be confined within the site boundary as far as is practicable. The following example dust control procedures could be employed to comply with this requirement, as necessary:

- Erection of dust screens around the perimeter of the site (as applicable);
- Securely covering all loads entering or exiting the site;
- Use of water sprays across the site to suppress dust;
- Covering of all stockpiles of contaminated soil or exposed contaminated soil remaining on site more than 24 hours;
- Include wheel wash (if applicable); and
- Keeping excavation and stockpile surfaces moist.

Regular checking of the fugitive dust issues is to be undertaken. Remedial measures are to be undertaken to rectify any cases of excessive dust.

The following plan which includes dust management, has been prepared for the SCAW project:

- CPBUI JV, *Air Quality Management Subplan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 1, 29 November 2022, Document SMWSASCA-CPU-1NL-NL000-AH-PLN-000001.

7. Odour Control Plan

No odours should be detected at any boundary of the site during remediation works. The following example procedures could be employed to comply with this requirement as required:

- Use of appropriate covering techniques such as plastic sheeting, polythene or geotextile membranes to cover excavation faces or stockpiles;
- Fine spray of water and/or hydrocarbon mitigating agent on the impacted areas / materials;
- The use of water spray, as and when appropriate;
- Use of sprays or sprinklers on stockpiles or loads to lightly condition the material;
- If required, restrict uncovered stockpiles to appropriate sizes to minimise odour generation;
- Ceasing works during periods of inclement weather such as high winds or heavy rain;
- Regular checking of the fugitive dust and odour issues to ensure compliance. Undertake immediate remediation measures to rectify any cases of excessive dust or odour (e.g., use of misting sprays or odour masking agent); and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

8. Work Health and Safety Plan

8.1 General

It is the Contractor's responsibility to devise a SWMS¹ (or series thereof, for various respective tasks) and to implement proper controls that enable the personnel undertaking the remediation to work in a safe environment. This RAP and SMP does not relieve the Remediation Contractor or other contractors of their ultimate responsibility for occupational health and safety of their workforce and to prevent contamination of areas outside the 'remediation' workspace. This RAP and SMP sets out general procedures and the minimum standards and guidelines for remediation that will need to be used in preparing the safe work method statement.

This work health safety plan (WHSP) has been prepared with reference to CRC CARE *Remediation Action Plan: Implementation - Guideline on Health and Safety* (CRC CARE, 2019). The requirements of this WHSP must be incorporated into the Contractor's SWMS.

All site work must be undertaken in a controlled and safe manner with due regard to potential hazards, training and safe work practices. To attain this the SWMS developed by the Contractor must comply with policies specified in the *Work Health and Safety Regulation 2011*.

All appropriate permits, licences and notifications required for the remediation activities must be obtained prior to the commencement of remediation works.

¹ Either a SWMS or construction environmental management plan (CEMP), or other equivalent document incorporating health and safety aspects of the proposed remedial works.

8.2 Site Access

Appropriate fencing and signage must be installed around and within the site to prevent unauthorised access and restrict access to remediation areas and / or excavations. Access restrictions and administrative arrangements for management of entry of workers or related personnel on site is the responsibility of the Contractor.

Any existing pits or unstable areas on site that may generate potential safety, or operational risk should be demarcated and taped off, with appropriate rectification action undertaken (e.g., backfilling of pits).

8.3 Personnel and Responsibilities

Before undertaking works on site, all personnel will be made aware of the officer responsible for implementing WHS procedures. All personnel must read and understand this WHSP and over-arching SWMS prior to commencing site works and sign a statement to that effect. Contractors employed at the site will be responsible for ensuring that their employees are aware of, and comply with, the requirements of this WHSP and Contractor's SWMS.

8.4 Chemical and Physical Hazards

The following hazards are associated with conditions that may be created during remediation works:

- Heat exposure;
- Excavations;
- Buried services;
- Noise;
- Dust;
- Electrical equipment;
- Heavy equipment and truck operation;
- Chemical exposure; and
- Asbestos.

Safe work practices must be employed to manage the hazards identified above.

For the most part, the chemical and physical hazards can be managed through appropriate demarcation, access controls and the use of appropriate PPE.

8.5 Safe Work Practices

The appropriate safe work practices should be clearly defined by the Contractor in their SWMS. As a minimum, all personnel on site will be required to wear the following PPE:

- Steel-capped boots (mandatory);

- High visibility clothing / vest (mandatory);
- Safety glasses or safety goggles with side shields requirements (as necessary);
- Hard hat (as necessary);
- Appropriate respiratory and protective equipment for any works involving asbestos; and
- Hearing protection when working in the vicinity of machinery or plant equipment if noise levels exceed exposure standards (as necessary).

Each item of PPE should meet the corresponding relevant Australian Standard(s).

Specific safe work practices will be adopted when working with asbestos, in accordance with (but not limited to) the following codes of practice:

- SafeWork NSW *Code of Practice, How to Manage and Control Asbestos in the Workplace* (SafeWork NSW, 2019a);
- SafeWork NSW *Code of Practice, How to Safely Remove Asbestos* (SafeWork NSW, 2019b);
- WorkCover NSW *Managing Asbestos in or on Soil* (WorkCover NSW, 2014); and
- NOHSC *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed* (NOHSC, 2005).

9. Remediation Schedule and Hours of Operation

The remediation works will be conducted within the days and hours specified the Environment Protection Licence (21695).

10. Response to Incidents

The key to effective management of incidents is the timely action taken before any situation reaches a reportable or critical level. Therefore, surveillance activities are extremely important, and should be conducted for the measures prescribed herein and any other measures prescribed in any additional environmental management plan developed subsequently. During construction activities on the site, the following inspection or preventative actions should be performed by the Contractor:

- Regular inspection of works;
- Completion of routine environmental checklists and follow-up of non-compliance situations;
- Maintenance and supervision on-site; and
- An induction process for site personnel involved in the remediation works that includes relevant information on the contamination status of the site, the remediation works being undertaken, worker health and environmental protection requirements, and ensures that all site personnel are familiar with the site emergency procedures.

The following emergency response plan has been prepared for the project:

- CPBUI JV, *Emergency Response Plan, Western Sydney Airport – Surface and Civil Alignment Works*, Revision 2, 23 August 2022, Document Number SMWSASCA-CPU-1NL-NL000-ER-PLN-000007.

The Contractor will be responsible for ensuring that site personnel are aware of the emergency services available and the appropriate contact details provided in the emergency response plan. A site Safety Officer should be contactable, or available, on-site during remediation and development works.

11. Community Communications Strategy

The following community communications strategy have been prepared for the SCAW project:

- CPBUI JV, *Community Communications Strategy, Sydney Metro - Western Sydney Airport, Surface and Civil Alignment Works Package*, Version 3, 24 November 2022, Document Number SMWSASCA-CPU-1NL-NL000-CY-PLN-000001;
- CPBUI JV, *Community Communication Strategy, Sydney Metro – Western Sydney Airport, Surface and Civil Alignment Works Package, Southern Project Region – Sub-Plan*, Version 3, 9 December 2022, Document Number SMWSASCA-CPU-1NL-NL000-CY-PLN-000003; and
- CPBUI JV, *Community Communication Strategy, Sydney Metro – Western Sydney Airport, Surface and Civil Alignment Works Package, Northern Project Region – Sub-Plan*, Version 3, 9 December 2022, Document Number SMWSASCA-CPU-1NL-NL000-CY-PLN-000002.

12. References

CRC CARE. (2019). *Remediation Action Plan: Implementation - Guideline on Health and Safety*. National Remediation Framework: CRC for Contamination Assessment and Remediation of the Environment.

NOHSC. (2005). *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Ed*. Canberra, April 2005, NOHSC:3003: National Occupational Health and Safety Commission, Commonwealth of Australia.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

SafeWork NSW. (2019a). *Code of Practice, How to Manage and Control Asbestos in the Workplace*. August 2019.

SafeWork NSW. (2019b). *Code of Practice, How to Safely Remove Asbestos*. August 2019: SafeWork NSW, NSW Government.

WorkCover NSW. (2014). *Managing Asbestos in or on Soil*. March 2014: WorkCover NSW, NSW Government.

Douglas Partners Pty Ltd

Appendix E

Environment Protection Licence



Environment Protection Licence

Licence - 21695

Licence Details	
Number:	21695
Anniversary Date:	19-August
Licensee	
CPB CONTRACTORS PTY LIMITED	
LEVEL 4/177 PACIFIC HIGHWAY	
NORTH SYDNEY NSW 2059	
Premises	
SYDNEY METRO WESTERN SYDNEY AIRPORT SCAW PACKAGE FOOTPRINT	
NA	
LUDDENHAM NSW 2745	
Scheduled Activity	
Railway activites - railway infrastructure construction	
Fee Based Activity	Scale
Railway infrastructure construction (>=50,000T & track to be constructed <=10km)	> 2000000 Remaining extraction or processing
Contact Us	
NSW EPA	
6 Parramatta Square	
10 Darcy Street	
PARRAMATTA NSW 2150	
Phone: 131 555	
Email: info@epa.nsw.gov.au	
Locked Bag 5022	
PARRAMATTA NSW 2124	



Environment Protection Licence

Licence - 21695

INFORMATION ABOUT THIS LICENCE	4
Dictionary	4
Responsibilities of licensee	4
Variation of licence conditions	4
Duration of licence	4
Licence review	4
Fees and annual return to be sent to the EPA	4
Transfer of licence	5
Public register and access to monitoring data	5
1 ADMINISTRATIVE CONDITIONS	6
A1 What the licence authorises and regulates	6
A2 Premises or plant to which this licence applies	6
A3 Information supplied to the EPA	7
A4 Other administrative conditions	7
2 DISCHARGES TO AIR AND WATER AND APPLICATIONS TO LAND	7
P1 Location of monitoring/discharge points and areas	7
3 LIMIT CONDITIONS	8
L1 Pollution of waters	8
L2 Concentration limits	8
L3 Noise limits	9
L4 Blasting	9
L5 Hours of operation	9
L6 Potentially offensive odour	13
4 OPERATING CONDITIONS	13
O1 Activities must be carried out in a competent manner	13
O2 Maintenance of plant and equipment	13
O3 Dust	13
O4 Processes and management	14
O5 Waste management	14
5 MONITORING AND RECORDING CONDITIONS	16
M1 Monitoring records	16
M2 Requirement to monitor concentration of pollutants discharged	16
M3 Testing methods - concentration limits	17
M4 Environmental monitoring	17
M5 Weather monitoring	17



Environment Protection Licence

Licence - 21695

M6	Recording of pollution complaints	18
M7	Telephone complaints line	18
6	REPORTING CONDITIONS	19
R1	Annual return documents	19
R2	Notification of environmental harm	20
R3	Written report	20
R4	Other reporting conditions	21
7	GENERAL CONDITIONS	22
G1	Copy of licence kept at the premises or plant	22
G2	Contact number for incidents and responsible employees	23
G3	Other general conditions	23
8	SPECIAL CONDITIONS	23
E1	Community Agreements	23
E2	Special Dictionary	25
DICTIONARY		28
	General Dictionary	28

Environment Protection Licence

Licence - 21695

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).



Environment Protection Licence

Licence - 21695

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

CPB CONTRACTORS PTY LIMITED
LEVEL 4/177 PACIFIC HIGHWAY
NORTH SYDNEY NSW 2059

subject to the conditions which follow.



Environment Protection Licence

Licence - 21695

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Railway activities - railway infrastructure construction	Railway infrastructure construction (>=50,000T & track to be constructed <=10km)	> 2000000 Remaining extraction or processing

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
SYDNEY METRO WESTERN SYDNEY AIRPORT SCAW PACKAGE FOOTPRINT
NA
LUDDENHAM
NSW 2745

- A2.2 In relation to Condition A2.1, the premises are defined by the most recent premises map(s) held on EPA Electronic File EF22/7797 and approved in writing by the EPA.
- A2.3 Premises map(s) changes are permitted to be altered through this condition. Any proposed variations to the premises must:
- a) be submitted to the EPA in electronic format for approval;
 - b) be clearly described on a complete map set containing unique identifiers for revision number, map sheet numbers and issue date;
 - c) be submitted to the EPA no less than 5 business days prior to the date of the scheduled land portion handover, land portion surrenders, land portion additions or any other changes;
 - d) be clearly described in writing submitted at the same time as the complete map set;
 - e) be lawful and permitted under the relevant approval; and
 - f) if changes to the nature of works are proposed, the licensee must demonstrate any additional environmental impacts in relation to any changes have been considered and can be managed in an appropriate manner.
- A2.4 The most recently approved premises map(s) must be available for public viewing on the licensee's project website or a related website approved in writing by the EPA no more than 5 business days after the approval of the map(s) by the EPA.
- The requirements outlined in this condition only come into force when works or activities commence at the



Environment Protection Licence

Licence - 21695

licensed premises.

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

A3.2 Unless specifically stated by another condition of this licence, Environmental Management Plans or systems supplied to the EPA by the licensee do not form part of this licence.

A3.3 Whenever collecting information from any member of the public, including complaints or consent to out of hours work, a licensee must seek consent from the member of the public for the disclosure of their personal information, and collection by the EPA, or any other NSW government agency.

A4 Other administrative conditions

A4.1 The EPA must be notified in writing, of the intention to commence works or activities authorised by this licence at the premises for the first time, at least 5 business days prior to the proposed commencement of those works or activities.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Temporary sediment basin	Temporary sediment basin	Elizabeth Drive

P1.2 All licensed monitoring and discharge points referred to in condition P1.1, must be approved by the EPA and identified:

- a) in the premises map(s) most recently submitted and approved in writing by the EPA under condition A2.2; and
- b) in a schedule submitted to the EPA. The schedule, including any proposed updates, must:



Environment Protection Licence

Licence - 21695

- i. be submitted to the EPA in electronic format no less than 5 days prior to any changes;
- ii. include unique identifiers consistent with the map(s) required by this condition; and
- iii. include easting and northing coordinates for all licensed monitoring and discharge points.

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

- L2.1 For each monitoring/discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.
- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table/s.
- L2.4 Water and/or Land Concentration Limits

POINT 1

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Oil and Grease	Visible				Not Visible
pH	pH				6.5-8.5
Turbidity	nephelometric turbidity units				50

- L2.5 Exceeding the limits specified in Condition L2.4 of this licence for discharges from the discharge point(s) identified by conditions P1.1 is only permitted if:
- a) the discharge occurs solely as a result of rainfall measured at the premises exceeding the design rainfall depth value for the corresponding discharge point; and

Environment Protection Licence

Licence - 21695

b) The sediment basins and other erosion and sediment controls corresponding to the discharge point(s) have been designed, constructed, operated and maintained in accordance with condition O4.2 of this licence.

L3 Noise limits

- L3.1 The licensee must minimise noise and vibration impacts at residences and other sensitive land uses. To meet the requirements of this condition the licensee must:
- a) implement the guidance in the Interim Construction Noise Guideline (DEC, 2009) and the Assessing Vibration: a technical guideline (DEC, 2006);
 - b) implement all reasonable and feasible measures to minimise noise impacts in accordance with the Interim Construction Noise Guideline (DEC, 2009); and
 - c) implement vibration mitigation in accordance with the Assessing Vibration: a Technical Guideline (DEC, 2006).
- In this condition, 'reasonable' and 'feasible', in relation to noise management, have the same meaning as defined in the Interim Construction Noise Guideline (DEC, 2009).
- L3.2 When construction activities include 'High Noise Impact Activities and Works' as defined in the special dictionary in this licence, quantitative construction noise assessments must apply a +5dB correction to the measured or predicted level of construction noise at the nearest Noise Sensitive Receiver location before assessment against the Interim Construction Noise Guideline (DECC, 2009) noise management levels.

L4 Blasting

- L4.1 All blasting activities are prohibited on the licensed premises.

L5 Hours of operation

- L5.1 Standard construction hours
- Unless permitted by another condition of this licence, works and activities must:
- a) only be undertaken between the hours of 7:00 am and 6:00 pm Monday to Friday;
 - b) only be undertaken between the hours of 8:00 am and 1:00 pm Saturday; and
 - c) not be undertaken on Sundays or Public Holidays.
- L5.2 High Noise Impact Activities and Works
- Unless permitted by another condition of this licence, any High Noise Impact Activities and Works that exceed the applicable Noise Management Level (NML) at a Noise Sensitive Receiver must only be undertaken:
- a) between 8:00 am and 6:00 pm Monday to Friday;
 - b) between 8:00 am and 1:00 pm Saturday; and
 - c) if high noise impact works are to be conducted continuously and the location of the works means that it is likely to impact the same receivers, then the works must be conducted in continuous blocks of no more than 3 hours, with at least a 1-hour respite between each block of continuous high noise impact work; except as expressly permitted by another condition of this licence.

Environment Protection Licence

Licence - 21695

Note: For the purposes of this condition 'continuous' includes any period where there is a less than 1-hour respite between ceasing and recommencing of any work that is subject to this condition.

L5.3 Exemptions to standard construction hours for low noise impact works

Works and activities may be carried on outside of standard construction hours specified in condition L5.1 if the works and activities do not cause, when assessed at the boundary of the most affected Noise Sensitive Receiver:

- a) LAeq(15 minute) noise levels greater than 5dB above the day, evening and night Rating Background Level (RBL) as applicable;
- b) LAmax noise levels greater than 15dB above the night RBL for night works;
- c) the preferred continuous or impulsive vibration values greater than those for human exposure to vibration, set out for residences in Table 2.2 in Assessing Vibration: a technical guideline (DEC, 2006); and
- d) the preferred intermittent vibration values greater than those for human exposure to vibration, set out for residences in Table 2.4 in Assessing Vibration: a technical guideline (DEC, 2006).

For the purposes of this condition, the RBLs are those contained in an environmental assessment for the activities subject to this licence prepared under the Environmental Planning and Assessment Act 1979. Alternatively, the licensee may use another RBL determined in accordance with the Noise Policy for Industry (EPA, 2017) and provided to the EPA prior to carrying out any works or activities under this condition.

The notification requirements under condition L5.5 do not apply to this condition.

L5.4 Exemptions to standard construction hours in exceptional circumstances

a) The licensee may undertake works and activities outside of standard construction hours specified in condition L5.1 for:

- i. emergency works required to avoid the loss of life or property, or to prevent material harm to the environment; and
- ii. the delivery of oversized plant, structures or materials determined by the police or other authorised authorities to require special arrangements to transport along public roads.

b) The licensee must, on becoming aware of the need to undertake emergency works under this condition notify the EPA's Environment Line as soon as practicable and submit a report to the EPA by 4:00 pm on the next business day after the emergency works commenced that describes:

- i. the cause, time and duration of the emergency;
- ii. action taken by or on behalf of the licensee in relation to the emergency; and
- iii. details of any measures taken or proposed to be taken by the licensee to prevent or mitigate against a recurrence of the emergency.

For the purposes of this condition, 'material harm to the environment' has the same meaning as in section 147 of the POEO Act.

Emergency works do not require a notification under condition L5.5.

L5.5 Works outside of standard construction hours - Notification

The licensee must notify potentially affected Noise Sensitive Receivers of works outside of standard construction hours unless notification under this condition is not required as specified in another condition of this licence.

Environment Protection Licence

Licence - 21695

a) The notification must:

- i. be given not less than 5 calendar days and not more than 14 calendar days before those works are to be undertaken, unless otherwise agreed with the affected community and notified to the EPA;
- ii. be undertaken by letterbox drop, email, text message or other targeted and equivalent method; and
- iii. be detailed on the project website or other relevant website notified to the EPA.

b) The notification required by this Condition must:

- i. clearly outline the reason that the work is required to be undertaken outside the hours specified in condition L5.1;
- ii. include a diagram that clearly identifies the location of the proposed works in relation to nearby cross streets and local landmarks;
- iii. include details of the date, timing and relevant time restrictions that apply to the proposed works;
- iv. clearly outline in plain English, the location, nature, scope and duration of the proposed works;
- v. detail the expected noise impact of the works on Noise Sensitive Receivers;
- vi. clearly state how complaints may be made and additional information obtained;
- vii. include the number of the telephone complaints line required by condition M7.1, an after hours contact phone number specific to the works undertaken outside the hours specified in condition L5.1, and the project website address; and
- viii. include consideration of culturally and linguistically diverse Noise Sensitive Receivers where required.

L5.6 The licensee must make all reasonable and feasible efforts to coordinate all works outside of standard construction hours with any neighbouring concurrent construction works that have the potential to impact the same Noise Sensitive Receivers. The licensee must ensure Respite Periods are being achieved as much as is reasonably practicable.

Note: This condition does not apply to low impact noise work permitted by condition L5.3 or emergency works permitted by L5.4 of this licence.

L5.7 Works outside of standard construction hours

Under this condition, works and activities may be undertaken outside of standard construction hours specified in condition L5.1 and L5.2, but only if they are required in relation to one or more of the following:

- a) carrying on those works and activities during standard construction hours would result in a high risk to construction personnel or public safety, based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2018 "Risk Management";
- b) the Relevant Road Network Operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to road network operational performance;
- c) a relevant utility service operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to the operation and integrity of the utility network;
- d) the TfNSW Transport Management Centre (or other road authority) have refused to issue a road occupancy licence during standard construction hours; or
- e) Sydney Trains (or other rail authority) requires a rail possession for the activities to be performed outside of standard construction hours.

L5.8 Works outside of standard construction hours - Regulatory Requirements

In undertaking any works and activities outside of standard construction hours under condition L5.7, the licensee must comply with the following:

- a) Prepare a construction noise and vibration impact assessment in accordance with the Interim Construction

Environment Protection Licence

Licence - 21695

Noise Guideline (DEC, 2009) that is to include:

- i. a description of the proposed works and activities outside of standard construction hours;
- ii. predictions of LAeq (15 minute) dB noise levels at noise sensitive receivers from these works and activities, where noise levels are predicted to be greater than those permitted under condition L5.3; and
- iii. a monitoring plan to validate the noise predictions, based on monitoring at the boundary of representative sensitive receivers during noise generating activities that are representative of the works and activities, including during the period/s predicted to have the highest noise level impacts.
- b) Undertake noise monitoring in accordance with the monitoring plan required by condition L5.8(a)(iii).
- c) Only undertake activities between the hours of 6:00pm on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays and 7:00am the following day (unless permitted by another condition of this licence).
- d) Activities are not to be undertaken between the hours of 6:00pm on Saturdays, Sundays or Public Holidays and 7:00am the following day (unless permitted by another condition of this licence).
- e) Ensure that works and activities do not result in noise levels exceeding those specified in condition L5.3 at the same noise sensitive receivers (unless specified in another condition of this licence) on more than:
 - i. 2 consecutive evenings and/or nights at any time; and
 - ii. 3 evenings and/or nights per week; and
 - iii. 10 evenings and/or nights per month.
- f) Undertake any high noise impact works before 12:00 am (midnight) where reasonable and feasible.
- g) Where high noise impact activities are undertaken, the respite provisions as per the requirements of condition L5.2(c) do not apply provided that all High Noise Impact Activities and Works are undertaken prior to 12:00 am (midnight).
- h) Where high noise impact activities are undertaken after 12:00 am (midnight), the respite provisions in condition L5.2(c) apply.
- i) Upon request of an authorised officer, the licensee must provide within 5 business day:
 - i. the construction noise and vibration impact assessment required by condition L5.8(a);
 - ii. noise monitoring results required by condition L5.8(b);
 - iii. written evidence demonstrating the works are necessary and permitted under condition L5.7; and/or
 - iv. any other relevant information or records requested by the EPA.
- j) the notification requirements under condition L5.5 apply to this condition.

L5.9 Concrete works associated with station, bridges, viaduct and retaining wall construction, including concrete pouring, finishing and cleaning, are permitted to be undertaken outside of standard construction hours specified in L5.1 provided that:

- a. Works are required to achieve compliance with overarching project technical requirements,
- b. Works had already begun within a reasonable time prior to end of standard construction hours,
- c. OOHW are undertaken from 6pm to 10pm, Monday to Friday and 1pm to 6pm on Saturday,
- d. Concreting activities (e.g. using concrete pump, vibrators, concrete trucks, etc) must be completed before 8pm on Monday to Friday,
- e. Concrete finishing works (e.g. power floats, hand tools) must be completed before 10pm on Monday to Friday,
- f. Works are permitted to occur until 30 November 2023.

L5.10 The licensee may undertake works outside of standard construction hours specified in condition L5.1 to install drainage infrastructure on the SMWSA SCAW access road at 1793 Elizabeth Drive, Badgerys Creek.

- a) Works undertaken in accordance with condition L5.10 must:
 - i. Be conducted over a single 4-day, three-night shutdown period (Friday – Monday) in the months of September to November 2023.
- b) The licensee must:
 - i. Notify potential affected noise sensitive receivers in accordance with condition L5.5
 - ii. Comply with condition L5.8 (a), (b), (f) & (g); and

Environment Protection Licence

Licence - 21695

- iii. Provide the EPA with a Noise Monitoring Report within 5 business days of completion of works.

L6 Potentially offensive odour

- L6.1 No condition in this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

- O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

- O2.2 All erosion and sediment control measures installed on the premises are considered as 'plant and equipment' for the purpose of complying with condition O2.1 of this licence.

O3 Dust

- O3.1 All activities occurring at the premises must be carried out in a manner that will minimise the generation and emission of air pollution from the premises as much to the greatest extent practicable.

- O3.2 The premises must be maintained in a condition which minimises the generation and emission of air pollution from the premises to the greatest extent practicable.

- O3.3 The licensee must implement all reasonable and feasible measures to demonstrate compliance with condition O3.1 and O3.2.

- O3.4 Trucks entering and leaving the premises that are carrying loads of material with the potential to generate dust must be covered at all times, except during loading and unloading

Environment Protection Licence

Licence - 21695

O4 Processes and management

- O4.1 The licensee must implement all feasible and reasonable erosion and sediment controls as may be necessary throughout the life of works and activities to minimise sediment leaving the premises.
- O4.2 The licensee must ensure erosion and sediment controls are designed, constructed, operated and maintained consistent with the principle and practices of industry best practice, including:
- a) Managing Urban Stormwater – Soils and Construction, Volume 2D, Main Road Construction (DECC, 2008), to be read and used in conjunction with Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom, 2004);
 - b) Best Practice Erosion and Sediment Control (IECA 2008); and
 - c) other industry best practice documents if it can demonstrate the guidance will provide improved or equivalent outcomes for the environment and meet the requirements of condition L1.1 of this licence.
- O4.3 The licensee must ensure:
- a) all vehicular access points to the premises are designed, constructed, maintained and stabilised to minimise vehicles tracking materials onto public roads and roads outside the premises as much as is reasonable and feasible;
 - b) vehicle, motorised plant and equipment movements onto or off the premises minimise the deposition of any material onto the surface of roads outside of the premises;
 - c) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer, motorised plant and equipment leaving the premises, is removed to the greatest extent practicable before it leaves the premises; and
 - d) road surfaces subject to any tracking of material by vehicles leaving the premises must be cleaned as required to ensure compliance with a) and b) of this condition and condition L1.1 of this licence.

O5 Waste management

- O5.1 The licensee must prepare and provide to the EPA a Construction Waste Management Plan (CWMP) for each stage of the project or where due to project variables the CWMP requires updating. The CWMP must be provided prior to the commencement of each stage of the project and include (at a minimum):
- a) the waste types and likely or estimated quantities for each waste type to be generated on the premises;
 - b) details of the proposed sampling, testing and other methods to be used to characterise and classify waste to be generated on the premises for waste management and transport purposes;
 - c) anticipated or known waste classification and characterisation of waste in accordance with the Waste Classification Guidelines Part 1: Classifying waste (EPA, 2014);
 - d) details of how and where the waste is anticipated to be reused, recycled, stored or disposed of;
 - e) the proposed methods and frequencies for conducting compliance checks under condition O5.4; and
 - f) the licensee must consider the guidance in Construction and demolition waste: a management toolkit (EPA, 2019) when preparing and implementing the CWMP.

Note: the requirements of this condition may be addressed in another plan or document provided to the EPA and referenced in the CWMP to satisfy the requirements of this condition.

- O5.2 The licensee must keep detailed records of waste generated, received or removed from the premises that includes (at a minimum):

Environment Protection Licence

Licence - 21695

- a) details of all waste transporters and the addresses and facility/business names of destination location(s) for all waste generated and transported off the premises for any purpose (including recycling, reuse, processing, treatment and disposal);
- b) documented evidence (such as a licence) from each place of disposal that they can lawfully receive and manage (store, process, reuse, dispose) the types of waste proposed to be transported there;
- c) details of all waste received on the premises or transported off the premises that is subject to a Resource Recovery Order and/or Exemption under the Protection of the Environment Operations (Waste) Regulation 2014, and demonstration that the waste meets the requirements of the Order and/or Exemption;
- d) legible copies of all documents/records evidencing that all waste transported from the premises was taken to and received at a facility/premises that lawfully accept and process the waste as intended;
- e) keep legible copies of any waste tracking documentation required for the offsite transport of the waste to demonstrate the waste was tracked in accordance with NSW legislation;
- f) comparisons showing the proposed waste quantities and waste types documented in the CWMP against the actual waste quantities and waste types; and
- g) comparisons showing intended reuse, recycling or disposal locations documented in the CWMP against actual reuse, recycling and disposal locations.

- O5.3** The CWMP must be implemented for the duration of licensed activities, and a copy of the current CWMP, historic versions of the CWMP and all records required by condition O5.2 must be kept on the premises for the duration of the licence and provided to an EPA officer upon request.
- O5.4** The licensee must conduct compliance checks pursuant to the compliance check frequencies provided in the CWMP. The compliance checks must be conducted while licenced waste activities are being undertaken to ensure that all waste is being managed, transported, reused, recycled or disposed in a lawful manner. The compliance checks must take the form of one or more of the following:
- a) desktop investigations, such as:
 - i. contacting reuse, recycling or disposal facilities directly;
 - ii. reviewing waste disposal dockets and waste transport tracking documentation and requirements;
 - iii. reviewing waste characterisation and classification information;
 - iv. reviewing exemption requirements against particular loads of waste;
 - v. reviewing environment protection licences, authorisations or approvals of facilities that receive waste generated by the project); or
 - b) site inspections to non-licenced reuse, recycling or disposal locations; or
 - c) any other method agreed in writing by the EPA.
- All compliance checks conducted under this condition must be recorded and provided to an authorised officer upon request.
- O5.5** The licensee must not cause, permit or allow any waste generated outside the licensed premises and Sydney Metro Western Sydney Airport Project including on-airport sites to be received at the licensed premises, except:
- a) virgin excavated natural material;
 - b) as expressly permitted by a condition of this licence; or
 - c) a resource recovery order and/or resource recovery exemption under the Protection of the Environment Operations (Waste) Regulation 2014.

Note: For the purposes of condition O5.5 and condition O5.6 the "Sydney Metro Western Sydney Airport Project including on-airport sites" refers to the site within the boundary marked in orange in Figure 4 on Page 19 of the *Western Sydney Airport - Airport Plan - Department of Infrastructure, Transport, Regional Development and Communications (September 2021)*, held on EPA Electronic File DOC22/399379-3



Environment Protection Licence

Licence - 21695

O5.6 Excavated material suitable for re-use within the premises may be transported to another part of the premises or from the Sydney Metro Western Sydney Airport Project including on-airport sites, to the premises by road.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

- M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:
- M2.2 Water and/ or Land Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Oil and Grease	Visible	Special Frequency 1	Visual Inspection
pH	pH	Special Frequency 1	Probe
Turbidity	nephelometric turbidity units	Special Frequency 1	Probe

- M2.3 For the purposes of Condition M2.2 and the Table thereto, 'Special Frequency 1' means:
- a) less than 24 hours prior to a controlled discharge and daily for any continued controlled discharge, when it is safe to do so; and
 - b) when rainfall causes a discharge from a sediment basin which has not been emptied within the design management period following cessation of a rainfall event, when it is safe to do so.

Environment Protection Licence

Licence - 21695

M3 Testing methods - concentration limits

- M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Environmental monitoring

- M4.1 All noise and vibration monitoring for the purposes of determining compliance with the conditions of this licence must be undertaken by a Competent Person as defined in the special dictionary of this licence.
- M4.2 All noise monitoring for the purposes of determining compliance with the conditions of this licence must consider and be generally undertaken in accordance with;
- (a) Australian Standard AS 1055: 2018 Acoustics - Description and measurement of environmental noise; and
 - (b) the compliance monitoring guidance provided in the chapter 7 'Monitoring Performance' of the Noise Policy for Industry (EPA, 2017).
- M4.3 All vibration monitoring must be:
- a) undertaken in accordance with the technical guidance provided in the Assessing Vibration: a technical guideline (DEC, 2006); and
 - b) assessed and reported against the acceptable and maximum values of human exposure to vibration set out in Tables 2.2 and 2.4 of this guideline.
- M4.4 The licensee must undertake noise and vibration monitoring as directed by an authorised officer of the EPA. Where the monitoring is requested to take place on private land (for example a residential property) the licensee must request permission to access the premises in advance and keep a record of permission requests and responses. If a licensee is unable to obtain permission, the licensee must undertake the monitoring at an indicative location where possible and they must provide the response (including any nil response) to the EPA.

M5 Weather monitoring

- M5.1 The licensee must monitor and record temperature, wind direction, wind velocity and rainfall at either the project weather station, or through analysis of equivalent weather information obtained from the Australian Bureau of Meteorology. Monitoring must:
- a) be representative of the premises;
 - b) commence prior to any works that may cause sediment to leave the premises; and
 - c) continue to be operated until soil disturbance activities cease at the premises and the site has been stabilised.

Environment Protection Licence

Licence - 21695

M6 Recording of pollution complaints

- M6.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.
- M6.2 The record must include details of the following:
- a) the date and time of the complaint;
 - b) the method by which the complaint was made;
 - c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - d) the nature of the complaint;
 - e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - f) if no action was taken by the licensee, the reasons why no action was taken.
- M6.3 The record of a complaint must be kept for at least 4 years after the complaint was made.
- M6.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M7 Telephone complaints line

- M7.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M7.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M7.3 The preceding two conditions do not apply until 2 weeks after the date of the issue of this licence.
- M7.4 For the purposes of condition M6.1, the telephone complaints line is operated by a third-party provider. The licensee must have staff available to respond to complaints during hours when works are occurring.
- M7.5 Unless otherwise undertaken by the project proponent, the licensee must undertake the following community notification activities:
- a) include on the project website or other relevant website information on:
 - i. the nature, location and estimated construction time of the works;
 - ii. what works are expected to exceed Interim Construction Noise Guideline (DECC, 2009) noise management levels and the noise control measures to be implemented;
 - iii. how members of the public can make a complaint on the telephone complaints line and online;
 - iv. the after hours contact telephone number for any out of hours works permitted by this licence; and
 - v. how the complaints will be processed;
 - b) public notices in local newspapers, including community language newspapers including the information required by part a) of this condition;
 - c) clear signage at the boundary of each worksite that contains both the telephone complaints line number

Environment Protection Licence

Licence - 21695

and the project website details;

d) ongoing additional community notification must be undertaken if:

- i. new sensitive receivers are affected by noise, vibration or other construction impacts; or
- ii. the details notified to the community in accordance with this condition materially change.

M7.6 Noise and Vibration Complaints

a) the licensee must commence investigation of noise and vibration complaints:

- i. within two hours of the complaint being made; or
- ii. in accordance with any documented complaint management agreement between the licensee and the complainant.

b) the licensee must offer to the complainant to undertake attended noise or vibration monitoring at their premises if:

- i. any investigation referred to in this condition identifies works or activities being undertaken on the licensed premises as the likely source of the complaint; and
- ii. the licensee is not in possession of noise monitoring data representative of the complainants location and of the subject works and activities being undertaken on the licensed premises.

c) if the occupant of the dwelling or management personnel of a Noise Sensitive Receiver (other than a dwelling) accepts the offer of attended noise or vibration monitoring the licensee must undertake that attended monitoring:

- i. as soon as practicable; or
- ii. at a time agreed with the complainant.

d) The licensee must, in respect of each complaint made, advise each complainant of the results of its investigation of their complaint and any proposed remedial action within a reasonable period of time.

6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Environment Protection Licence

Licence - 21695

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
- and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm

Environment Protection Licence

Licence - 21695

occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

- a) the cause, time and duration of the event;
- b) the type, volume and concentration of every pollutant discharged as a result of the event;
- c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
- d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 Daily Complaints Reports

- a) The licensee must submit by 4:00 pm each business day a report to the EPA that provides details of all complaints relating to activities regulated by this licence received on the telephone complaints line required by Condition M6.1 or through any other means.
- b) The report must be:
 - i. provided in a format approved in writing by the EPA;
 - ii. submitted to the email address nominated by the EPA; and
 - iii. include the complaints received in the previous 24 hours to 12pm;
- c) The licensee is not required to submit a report:
 - i. for any reporting period during which no complaints have been received;
 - ii. that would otherwise be required to be submitted on a Saturday, Sunday or public holiday. It must instead be submitted not later than 4:00pm on the next business day.

R4.2 Noise and Vibration Reports

- a) Upon request of an authorised officer, the licensee must submit a Preliminary Investigation Report to the EPA in respect of any noise or vibration monitoring undertaken in accordance with the requirements of Condition M2.4.
- b) The Preliminary Investigation Report must be submitted to the EPA by 4:00 pm on the afternoon of the next working day following any noise or vibration monitoring or other time as agreed in writing by EPA.
- c) The Preliminary Investigation Report must include:
 - i. numerical and/or graphical representation of the noise and vibration monitoring results including both ambient noise levels and the level of noise from activities on the premises only; and
 - ii. the noise levels reported using the following noise descriptors: LAeq,T; LAF90,T; and LAFmax,T (T representing the 15 minute measurement period unless an alternative period is justified); and

Environment Protection Licence

Licence - 21695

iii. an assessment of measured construction noise and vibration levels against noise limits or noise management levels specified in this licence, requirements in the project specific Construction Noise and Vibration Plan and/or Impact Statement prepared the activities, relevant noise modelling and any relevant noise guidelines.

R4.3 In the event of any exceedance of the Best Achievable Noise Performance Objectives identified in the project specific Construction Noise and Vibration Plan and/or Impact Statement ("the plans") prepared for the activities, the licensee must:

- a) investigate the cause of the exceedance and identify whether all feasible and reasonable noise and vibration mitigation measures identified in the plans have been effectively deployed;
- b) identify any noise and vibration measures recommended in the plans that were not effectively deployed;
- c) assess appropriate remedial actions to seek to achieve the best achievable noise performance objectives;
- d) submit a Follow-Up Investigation Report to the EPA within 5 business days (unless agreed in writing by the EPA) of any noise or vibration monitoring having been undertaken that detected the exceedance; and
- e) include the following information in the Follow-Up Investigation Report:
 - i. confirmation of whether noise monitoring has been undertaken in accordance with AS1055:2018 and the compliance monitoring guidance provided in the Interim Construction Noise Guideline (DECC, 2009);
 - ii. confirmation of whether vibration monitoring has been undertaken in accordance with the guidance provided in Assessing Vibration: a technical guideline (DEC, 2006);
 - iii. details of the prevailing meteorological conditions during the period when the monitoring was undertaken;
 - iv. a map of each noise and vibration monitoring location in relation to the noise source, including relevant distances;
 - v. numerical and graphical representation of the noise and vibration monitoring results;
 - vi. an analysis of the noise and vibration monitoring results;
 - vii. details of any remedial action taken in relation to the matter; and
 - viii. in cases not the subject of remedial action, detailed justification of the decision not to undertake remedial action.

R4.4 The licensee must record all inspections of erosion and sediment control measures installed on the premises, including observations and works undertaken to repair and maintain these measures, and provide these records to an authorised officer upon request.

7 General Conditions

G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

Note: The requirements outlined in this condition only come into force when works and activities commence at the licensed premises.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Environment Protection Licence

Licence - 21695

G2 Contact number for incidents and responsible employees

- G2.1 The licensee must provide the EPA with, and maintain, up to date contact details to enable the EPA:
- a) To contact either the licensee or a representative of the licensee who can respond at all times to incidents relating to the premises, and
 - b) To contact the licensee's senior employees or agents authorised at all times to;
 - i. speak on behalf of the licensee, and
 - ii. provide any information or document required under licence.
- G2.2 The contact details required by Condition G2.1 above must include:
- a) the full name and title of the authorised representatives and the scope of their respective authorisations; and
 - b) the direct telephone number, mobile number, email address and postal address for contacting each authorised representative.

G3 Other general conditions

- G3.1 Environmental Induction
- a) The licensee must ensure all personnel and contractors involved in undertaking any activity subject to this licence that has the potential to impact Noise Sensitive Receivers have received environmental induction training relevant to their role prior to undertaking that activity; and
 - b) The induction training must:
 - i. clearly identify the location of all noise sensitive receivers likely to be affected by noise or vibration generated during the course of the work undertaken by those personnel; and
 - ii. highlight the licence requirements to minimise noise and vibration impacts on Noise Sensitive Receivers.

8 Special Conditions

E1 Community Agreements

- E1.1 Work outside standard construction hours - community consultation and agreement
- The licensee may work outside standard construction hours (as defined in L5.1) in circumstances other than those permitted under conditions L5.3, L5.4, or any other condition of this licence if the Licensee:
- a) undertakes community consultation and agreement as described in E1.2;
 - b) submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and
 - c) obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours.
- E1.2 Requirements for community consultation and agreement
- Any community consultation and agreement undertaken with respect to the proposed out of hours works (OOHW) must:
- a) be prepared and implemented in accordance with the Interim Construction Noise Guidelines (DEC 2009),

Environment Protection Licence

Licence - 21695

the Noise Policy for Industry (EPA, 2017) and AS2436-2010: Guide to noise and vibration control on construction, demolition and maintenance sites;

b) include consultation of all noise sensitive receivers within the Community Affected Catchments. This includes Noise Sensitive Receivers that have declined to participate in previous agreements unless a community member has explicitly requested not to be involved in any future consultation about future OOHWS;

c) ensure that the noise sensitive receivers understand the nature of the works and any predicted impacts, including that consideration is made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers, and include details for interpreting services for languages other than English where required.

d) include in the community consultations with Noise Sensitive Receivers the following information:

- i. the actual works proposed;
- ii. any expected impacts in clear, plain English based on noise modelling;
- iii. the expected duration of the works;
- iv. any expected benefits for receivers;
- v. any other known concurrent OOHWS that will be occurring; and
- vi. any other OOHWS that will be occurring on the nights preceding and following the proposed works or, if the proposed work precedes or follows a weekend period, any other OOHWS that will be occurring on the weekend.

e) request consent from the Noise Sensitive Receiver for their responses to be provided to the EPA;

f) ensure that a record is kept when a licensee is unable to contact a noise sensitive receiver after three attempts, including leaving "sorry I missed you" cards explaining the reason for the visit and requesting a return phone call; and

g) demonstrate, where the OOHWS is predicted to go on longer than 28 calendar days, that the licensee has consulted the community in relation to re-engagement periods for the purpose of determining agreement from the community is maintained and continuing.

Detailed records are to be maintained by the licensee of all community consultations, including attempts to contact Noise Sensitive Receivers, and must be maintained for the duration of the licence.

Any Noise Sensitive Receiver who requests a copy of the record of conversations must be supplied with one.

E1.3 The licensee must report to the EPA the community consultation and agreement process that was undertaken with the Community Affected Catchments.

This report to the EPA must be:

- a) prepared in writing;
- b) detail the steps taken to fulfil the requirements of condition E1.2;
- c) demonstrate that the Noise Sensitive Receivers understood the nature of the works and any predicted impacts, including that consideration was made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers;
- d) provide the script used during the community consultation with Noise Sensitive Receivers;
- e) report community response and consent rates (including where no contact could be made) against the total community affected catchments, and must be broken down into response and consent rates based on sub-catchments that are delineated by affectation levels;
- f) include a noise validation monitoring plan as required by E1.4; and
- g) be submitted to the EPA at least 15 business days prior to any works that are the subject of the agreement being undertaken unless prior arrangements have been made with the EPA.

A copy of the report must be:

- a) kept by the licensee for the duration of this licence including on the premises, and made available to an EPA authorised officer on request; and
- b) be made available on the licensee's project website or another website approved in writing by the EPA for the duration of the OOHWS permitted under condition E1.1. (Personal details of Noise Sensitive Receivers must be omitted).



Environment Protection Licence

Licence - 21695

- E1.4 Noise Validation Monitoring
- A noise validation monitoring plan must be submitted to the EPA for approval as part of the community agreement documentation prior to any OOHW occurring.
- E1.5 Validation monitoring must be undertaken for any OOHW that are the approved under condition E1.1 and must:
- a) be undertaken in accordance with the monitoring plan prepared under condition E1.4;
 - b) be performed by a Competent Person;
 - c) be performed on at least the first 2 occasions (day, evening, nights) where OOHW will be undertaken and are likely to impact Noise Sensitive Receivers;
 - d) be performed on any other occasion (day, evening, night) where the nature of the works is likely to cause greater noise impacts than the first 2 occasions;
 - e) be representative of the impacts in terms of monitoring locations, time and duration of measurements; and
 - f) be recorded and provided to an EPA officer upon request.
- E1.6 If validation monitoring undertaken under Condition E1.5 shows that noise levels are higher than those predicted by any noise modelling undertaken as part of the community agreement, work practices must be modified immediately so that measured noise levels do not exceed predicted levels.
- Where it has been determined that works cannot be modified to achieve the predicted noise levels:
- a) the licensee must report immediately to the EPA; and
 - b) after considering the circumstances EPA may withdraw its permission under E1.1.
- E1.7 Ongoing community engagement and agreement
- a) For any approval of OOHW under E1.1 predicted to take longer than 28 calendar days to remain valid, the licensee must be able to demonstrate agreement from the community is maintained and continuing.
 - b) To demonstrate agreement from the community is maintained and continuing the licensee must:
 - i. engage the community to determine if a substantial majority of Noise Sensitive Receivers continue to consent to the OOHW pursuant to the re-engagement period determined under condition E1.3(g);
 - ii. provide the EPA with a report within 7 calendar days of the end of each re-engagement period summarising the community response including ongoing consent rates of the Noise Sensitive Receiver; and
 - c) Where the licensee is unable to demonstrate a substantial majority of agreement from Community Affected Catchment is maintained and continuing:
 - i. the licensee must report immediately to the EPA; and
 - ii. after considering the circumstances EPA may withdraw its permission under E1.1.

E2 Special Dictionary

E2.1 Special Dictionary

Term	Meaning
Best Achievable Noise Performance Objectives	The construction noise level predicted at a receiver location after all feasible and reasonable noise mitigation measures have been incorporated into the prediction model and considered in deriving the predicted noise level

Environment Protection Licence

Licence - 21695

Detailed/Construction Noise and Vibration Impact Assessment is a document or suite of documents that:	Describe the construction activities proposed; identifies the potential impacts of those activities on the community; the measures that will be used to reduce impacts on the affected community; how the community will be informed and engaged; and, how noise impacts will be monitored and enforced. They are often referred to as Noise and Vibration Management Plans, Construction Noise and Vibration Impact Statements, Construction Method Statements, Work Method Statements and the like.
Construction Work	includes all construction work and activities, and all construction-related work and activities, undertaken on the premises
High Noise Impact Activities and Works	means jack hammering, rock breaking or hammering, pile driving, vibratory rolling, cutting of pavement, concrete or steel or other work occurring on the surface that generates noise with impulsive, intermittent, tonal or low frequency characteristics
Interim Construction Noise Guidelines (ICNG)	Interim Construction Noise Guidelines (DECC, July 2009)
In Writing	documents are to be submitted electronically unless otherwise requested by EPA
Noise Management Level (NML)	has the same meaning as "Airborne Noise Management Levels" in the Interim Construction Noise Guideline (DECC 2009)
Noise sensitive receiver	Land uses that are sensitive to noise, including residences and other sensitive land uses detailed in Table 3 of the Interim Construction Noise Guideline (DECC 2009)
Operating Hours	means hours during which any construction-related works or activities are being undertaken, including outside of standard construction hours
Out of Hours	means hours outside those prescribed by condition L5.1
Rating Background Level (RBL)	the same meaning as in the Interim Construction Noise Guideline (DECC 2009)
Residence	A lawful and permanent structure erected in a land-use zone that permits residential use (or for which existing use rights under the EP&A Act apply) where a person/s permanently reside and is not, nor associated with, a commercial undertaking such as caretakers quarters, hotel, motel, transient holiday accommodation or caravan park
Resource Recovery Order and/or Exemption	As described under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014



Environment Protection Licence

Licence - 21695

Suitably Qualified and Experienced Person - For the purpose of noise monitoring, must satisfy one or more of the following	• Have qualifications and/or experience sufficient to fulfil the requirements of 'member' grade of the Australian Acoustical Society • Undertake duties of an acoustic consultant on behalf of a firm that is a member of the Association of Australasian Acoustical Consultants • Have a recognised tertiary qualification in a discipline pertinent to acoustics • Demonstrate competence through professional experience and/or technical expertise to the satisfaction of the EPA if requested.
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Environment Protection Licence

Licence - 21695

Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 21695

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .



Environment Protection Licence

Licence - 21695

TSP	Means total suspended particles.
TSS	Means total suspended solids.
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements.
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements.
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence.
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997.
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste.
Wellhead	Has the same meaning as in Schedule 1 to the Protection of the Environment Operations (General) Regulation 2021.

Ms Larissa Borysko

Environment Protection Authority

(By Delegation)

Date of this edition: 19-August-2022

End Notes		
2	Licence varied by notice	1622455 issued on 21-Sep-2022
3	Licence varied by notice	1631671 issued on 22-Sep-2023

Appendix F

Plans, Logs and
Results Summaries from Previous Investigations



Geotechnical Investigation Plan (8 of 22)

SYDNEY METRO -
WESTERN SYDNEY AIRPORT
(SMWSA)

Legend

- Major Road (NSW SS)
- Local Road (NSW SS)
- Watercourse (NSW SS)
- Cadastre (NSW SS, 2019)

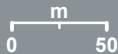
Phase 4B & 4C

- Borehole
- Borehole (Stand Pipe Installation)
- Hand Auger
- Dynamic Cone Penetrometer
- Test Pit

Phase 4D & 4E

- Borehole
- Borehole (Gas Pipe Installation)
- Borehole (Stand Pipe Installation)
- Hand Auger
- Test Pit

1:4,000 Scale at A3



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Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, this map contains data from a number of sources - no warranty is given that the information contained in this map is free from error or omission. Any reliance placed on such information shall at be the sole risk of the user. Please verify the accuracy of all information prior to using it. This map is not a design document.



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2021-11-05 | Project: 80021888
Coordinate System: GDA2020 MGA Zone 56
Map: 80021888-GS-GN-0010-Geotech_All_Phases.mxd 01
Aerial imagery supplied by MetroMap (June, 2021)

EXCAVATION - GEOLOGICAL LOG

PIT NO : SMGW-TP-B353 REV 0

FILE / JOB NO : 80021888

SHEET : 1 OF 1

PROJECT : SMWSA GI
LOCATION : 31-39 Luddenham Road Orchard Hills

POSITION : E: 292425.001, N: 6257790.718 (56 MGA2020)

SURFACE ELEVATION : 29.112 (AHD)

EQUIPMENT TYPE : 8t Excavator

METHOD : 600mm Toothed Bucket

DATE EXCAVATED : 17/8/21

LOGGED BY : NL

CHECKED BY : PW

EXCAVATION DIMENSIONS : 3.00 m LONG 1.00 m WIDE

DRILLING					MATERIAL									
VE E F H		SUPPORT	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	HAND PENETRO- METER	DCP TEST (AS 1289.6.3.2-1997) Blows/100 mm	STRUCTURE & Other Observations	
		STABLE	Not Encountered		0.0			FILL: SILTY SAND: brown, fine grained sand, with clay, with rootlets			100 200 300 400	5 10 15 20 25	TOPSOIL 0.00: All ES PID<10 ppm	
				0.50m B	0.40m	CLAYEY SAND: yellow-brown mottled grey, fine grained sand, low to medium plasticity clay, trace fine grained, sub-rounded gravel, trace rootlets				4	POSSIBLE ALLUVIUM			
				1.00m	SC	M	MD to D			2	1.00: Non-calcareous			
				1.50m	EXCAVATION SMGW-TP-B353 REV 0 TERMINATED AT 1.50 m Target depth					5	1.50: Non-calcareous			
					2.0									
					2.5									
					3.0									
					3.5									
					4.0									
					4.5									
					5.0									

PHOTOGRAPHS
NOTES

YES



NO

METHOD

N Natural Exposure
E Existing Excavation
BH Backhoe Bucket
B Bulldozer Blade
R Ripper

SUPPORT

T Timbering

PENETRATION



WATER

10 Oct., 73 Water
Level on Date shown
water inflow
water outflow

SAMPLES & FIELD TESTS

U50 - Undisturbed Sample
50 mm diameter
D - Disturbed Sample
B - Bulk Disturbed Sample
MC - Moisture Content
HP - Hand Penetrometer (UCS kPa)
VS - Vane Shear; P-Peak,
R-Remoulded (uncorrected kPa)
PBT - Plate Bearing TestCLASSIFICATION SYMBOLS &
SOIL DESCRIPTION
Based on Unified
Classification System

MOISTURE

D - Dry
M - Moist
W - WetCONSISTENCY/
RELATIVE DENSITYVS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very DenseSee Explanatory Notes for
details of abbreviations
& basis of descriptions.

CARDNO NSW/ACT PTY LTD



							BTEx					MAH										TRH					CRC Core TPH Fractions																	
							Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total MAH	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Isopropylbenzene	n-butylbenzene	p-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	tert-butylbenzene	C6-C9	C10-C14	C15-C18	C19-C24	C10-C18 (sum of total)	TPH C10-C14 Fraction after Silica Cleanup	TPH C15-C18 Fraction after Silica Cleanup	TPH C19-C24 Fraction after Silica Cleanup	C10-C18 Fraction (sum) (SG)	C6-C10	C10-C16	C16-C24	C24-C40	C10-C40 (sum of total)	F1-C10 less BTEx	F2-C10-C16 less NAPHTHALENE	>C10-C16 fraction (SG)	>C16-C24 fraction (SG)	>C24-C40 fraction (SG)	>C40-C60 fraction (um) (SG)		
EOL							0.1	0.1	0.1	0.2	0.1	0.3	0.5	0.5	0.5	0.5	1	1	1	1	0.5	1	20	20	50	50	50	20	50	50	50	100	20	50	100	100	100	20	50	50	100	100	100	
NSW 2014 General Solid Waste CT1 (No Leaching)							10	288	600			1000										60		650				10000																
NSW EPA PFAS Waste Class Addendum 2016 - SCC1																																												
NSW 2014 Restricted Solid Waste CT2 (No Leaching)							40	1152	2400			4000										240		2600				40000																
NSW EPA PFAS Waste Class Addendum 2016 - SCC2																																												
NSW TCEP1 Criteria																																												
Airports (Environmental Protection) Regulations 1997 - general soils							1	130	50			25																																
NEPM 2013 EIL/ESL UR/POS, Site Specific (Clay)							50	85	70			180																																
NEPM 2013 EIL/ESL UR/POS, Site Specific (Rock)							50	85	70			180																																
NEPM 2013 EIL/ESL Comm./Ind., Site Specific (Clay)							75	135	165			180																																
NEPM 2013 EIL/ESL Comm./Ind., Site Specific (Rock)							75	135	165			180																																
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses																																												
NEPM 2013 HIL, Recreational C																																												
PFAS NEMP 2.0 Table 2 Health Public open space																																												
NEPM 2013 HIL, Commercial/Industrial D																																												
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Clay																																												
0-1m							4	NL	NL			NL																													310	NL		
1-2m							6	NL	NL			NL																														480	NL	
2-4m							9	NL	NL			NL																														NL		
>4m							20	NL	NL			NL																														NL		
PFAS NEMP 2.0 Table 2 Industrial/Commercial																																												
NEPM 2013 Management Limits, C/I, Coarse Soil																																												
Field ID	Alternative Name	Sample Date	Easting	Northing	Depth	Report number																	700	1000									700	1000	3500	10000								
HA-A373_0.1	SMGW-HA-A373_0.1	13/07/2021	291841.9376	6259133.597	0.1	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A373_0.3	SMGW-HA-A373_0.3	13/07/2021	291841.9376	6259133.597	0.3	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A373_0.9	SMGW-HA-A373_0.9	13/07/2021	291841.9376	6259133.597	0.9	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A373_1.2	SMGW-HA-A373_1.2	13/07/2021	291841.9376	6259133.597	1.2	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A375_0.1	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
QA100_130721	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-					
QA200_130721	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	274456	<0.2	<0.5	<1	<2	<1	<3	-	-	-	-	-	-	-	-	-	-	<25	<50	<100	<100	-	-	-	-	<25	<50	<100	<100	<50	<25	<50	-	-	-	-			
HA-A375_0.5	SMGW-HA-A375_0.5	13/07/2021	291858.4636	6259125.006	0.5	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-					
HA-A375_0.9	SMGW-HA-A375_0.9	13/07/2021	291858.4636	6259125.006	0.9	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A374_0.1	SMGW-HA-A374_0.1	13/07/2021	291842.1546	6259118.382	0.1	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
HA-A374_0.4	SMGW-HA-A374_0.4	13/07/2021	291842.1546	6259118.382	0.4	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-					
HA-A374_0.7	SMGW-HA-A374_0.7	13/07/2021	291842.1546	6259118.382	0.7	811556	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	-	-	-	-	<0.5	-	<20	<20	<50	<50	<50	-	-	<20	<50	<100	<100	<100	<20	<50	-	-	-	-				
BH-A3725_0.1	SMGW-BH-A3725_0.1	18/07/2021	291844.8286	6259101.848	0.1	811834	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5																															

Page 9

							Heptachlorobenzene
							mg/kg
EQL							0.05
NSW 2014 General Solid Waste CT1 (No Leaching)							
NSW EPA PFAS Waste Class Addendum 2016 - SCC1							
NSW 2014 Restricted Solid Waste CT2 (No Leaching)							
NSW EPA PFAS Waste Class Addendum 2016 - SCC2							
NSW TCLP1 Criteria							
Airports (Environmental Protection) Regulations 1997 - general soils							
NEPM 2013 EL/ESL UR.POS, Site Specific (Clay)							
NEPM 2013 EL/ESL UR.POS, Site Specific (Rock)							
NEPM 2013 EL/ESL Comm./Ind., Site Specific (Clay)							
NEPM 2013 EL/ESL Comm./Ind., Site Specific (Rock)							
PFAS NEMP 2.0 Table 3 Ecological Indirect Exposure - All Land Uses							
NEPM 2013 HIL, Recreational C							10
PFAS NEMP 2.0 Table 2 Health Public open space							
NEPM 2013 Soil HSL Commercial/Industrial D							80
NEPM 2013 Soil HSL Commercial/Industrial D, for Vapour Intrusion, Clay							
0-1m							
1-2m							
2-4m							
>4m							
PFAS NEMP 2.0 Table 2 Industrial/Commercial							
NEPM 2013 Management Limits, C/A, Coarse Soil							
Field ID	Alternative Name	Sample Date	Easting	Northing	Depth	Report number	
HA-A373_0.1	SMGW-HA-A373_0.1	13/07/2021	291841.9376	6259133.597	0.1	811556	<0.05
HA-A373_0.3	SMGW-HA-A373_0.3	13/07/2021	291841.9376	6259133.597	0.3	811556	<0.05
HA-A373_0.9	SMGW-HA-A373_0.9	13/07/2021	291841.9376	6259133.597	0.9	811556	<0.05
HA-A373_1.2	SMGW-HA-A373_1.2	13/07/2021	291841.9376	6259133.597	1.2	811556	<0.05
HA-A375_0.1	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	811556	<0.05
QA100_130721	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	811556	<0.05
QA200_130721	SMGW-HA-A375_0.1	13/07/2021	291858.4636	6259125.006	0.1	274456	<0.1
HA-A375_0.5	SMGW-HA-A375_0.5	13/07/2021	291858.4636	6259125.006	0.5	811556	<0.05
HA-A375_0.9	SMGW-HA-A375_0.9	13/07/2021	291858.4636	6259125.006	0.9	811556	<0.05
HA-A374_0.1	SMGW-HA-A374_0.1	13/07/2021	291842.1546	6259118.382	0.1	811556	<0.05
HA-A374_0.4	SMGW-HA-A374_0.4	13/07/2021	291842.1546	6259118.382	0.4	811556	<0.05
HA-A374_0.7	SMGW-HA-A374_0.7	13/07/2021	291842.1546	6259118.382	0.7	811556	<0.05
BH-A3725_0.1	SMGW-BH-A3725_0.1	18/07/2021	291844.8286	6259101.848	0.1	811834	<0.05
BH-A3725_0.5	SMGW-BH-A3725_0.5	18/07/2021	291844.8286	6259101.848	0.5	811834	-
BH-A3725_3	SMGW-BH-A3725_3	18/07/2021	291844.8286	6259101.848	3	811834	-
BH-A3725_6	SMGW-BH-A3725_6	18/07/2021	291844.8286	6259101.848	6	811834	-
BH-A372_0.1	SMGW-BH-A372_0.1	15/07/2021	291841.5846	6259101.518	0.1	811822	<0.05
BH-A372_0.5	SMGW-BH-A372_0.5	15/07/2021	291841.5846	6259101.518	0.5	811822	<0.05
BH-A372_1	SMGW-BH-A372_1	15/07/2021	291841.5846	6259101.518	1	811822	-
BH-A372_1.5	SMGW-BH-A372_1.5	15/07/2021	291841.5846	6259101.518	1.5	811822	<0.05
BH-A372_2	SMGW-BH-A372_2	15/07/2021	291841.5846	6259101.518	2	811822	-
BH-A372_3	SMGW-BH-A372_3	15/07/2021	291841.5846	6259101.518	3	811822	<0.05
BH-A372_4	SMGW-BH-A372_4	15/07/2021	291841.5846	6259101.518	4	811822	-
BH-A372_5	SMGW-BH-A372_5	15/07/2021	291841.5846	6259101.518	5	811822	-
BH-A372_6.15	SMGW-BH-A372_6.15	23/07/2021	291841.5846	6259101.518	6.15	812617	-
BH-A372_7.15	SMGW-BH-A372_7.15	23/07/2021	291841.5846	6259101.518	7.15	812617	-
BH-A372_8.15	SMGW-BH-A372_8.15	23/07/2021	291841.5846	6259101.518	8.15	812617	-
BH-A372_9.15	SMGW-BH-A372_9.15	23/07/2021	291841.5846	6259101.518	9.15	812617	-
BH-A372_10.15	SMGW-BH-A372_10.15	23/07/2021	291841.5846	6259101.518	10.15	812617	-
BH-A372_11.15	SMGW-BH-A372_11.15	23/07/2021	291841.5846	6259101.518	11.15	812617	-
BH-A372_12.15	SMGW-BH-A372_12.15	23/07/2021	291841.5846	6259101.518	12.15	812617	-
BH-A372_13.15	SMGW-BH-A372_13.15	23/07/2021	291841.5846	6259101.518	13.15	812617	-
BH-A372_14.15	SMGW-BH-A372_14.15	23/07/2021	291841.5846	6259101.518	14.15	812617	-
BH-A372_15.15	SMGW-BH-A372_15.15	23/07/2021	291841.5846	6259101.518	15.15	812617	-
BH-A372_16.15	SMGW-BH-A372_16.15	23/07/2021	291841.5846	6259101.518	16.15	812617	-
BH-A372_17.15	SMGW-BH-A372_17.15	23/07/2021	291841.5846	6259101.518	17.15	812617	-
BH-A372_18.15	SMGW-BH-A372_18.15	23/07/2021	291841.5846	6259101.518	18.15	812617	-
BH-A372_19.15	SMGW-BH-A372_19.15	23/07/2021	291841.5846	6259101.518	19.15	812617	-
BH-A372_20.15	SMGW-BH-A372_20.15	23/07/2021	291841.5846	6259101.518	20.15	812617	-
BH-A372_21.15	SMGW-BH-A372_21.15	23/07/2021	291841.5846	6259101.518	21.15	812617	-
TP-B352_0.1	SMGW-TP-B352_0.1	17/08/2021	292198.182	6257906.397	0.1	818569	<0.05
TP-B352_1	SMGW-TP-B352_1	17/08/2021	292198.182	6257906.397	1	818569	-
TP-B352_1.5	SMGW-TP-B352_1.5	17/08/2021	292198.182	6257906.397	1.5	818569	-
TP-B353_0.1	SMGW-TP-B353_0.1	17/08/2021	292425.001	6257790.718	0.1	818569	<0.05
TP-B353_0.5	SMGW-TP-B353_0.5	17/08/2021	292425.001	6257790.718	0.5	818569	-
TP-B353_1.5	SMGW-TP-B353_1.5	17/08/2021	292425.001	6257790.718	1.5	818569	-
BH-B340_0.1	SMGW-BH-B340_0.1	27/08/2021	291776.273	6257631.191	0.1	828808	<0.05
QA-BH-B340_0.1	SMGW-BH-B340_0.1	27/08/2021	291776.273	6257631.191	0.1	828808	-
BH-B341_0.1	SMGW-BH-B341_0.1	23/08/2021	291776.273	6257631.191	0.1	820666	<0.05
BH-B340_0.5	SMGW-BH-B340_0.5	27/08/2021	291776.273	6257631.191	0.5	828808	-
BH-B341_0.5	SMGW-BH-B341_0.5	23/08/2021	291776.273	6257631.191	0.5	820666	-
BH-B341_1	SMGW-BH-B341_1	23/08/2021	291776.273	6257631.191	1	820666	-
BH-B341_1.5	SMGW-BH-B341_1.5	23/08/2021	291776.273	6257631.191	1.5	820666	-
BH-B341_2	SMGW-BH-B341_2	23/08/2021	291776.273	6257631.191	2	820666	-
BH-B341_3	SMGW-BH-B341_3	23/08/2021	291776.273	6257631.191	3	820666	-
BH-B341_4	SMGW-BH-B341_4	23/08/2021	291776.273	6257631.191	4	820666	-
BH-B340_5	SMGW-BH-B340_5	27/08/2021	291776.273	6257631.191	5	828808	-
BH-B341_5.2	SMGW-BH-B341_5.2	23/08/2021	291776.273	6257631.191	5.2	820666	-
BH-B340_7.15	SMGW-BH-B340_7.15	27/08/2021	291776.273	6257631.191	7.15	828808	-
BH-B341_8.17	SMGW-BH-B341_8.17	23/08/2021	291776.273	6257631.191	8.17	820666	-
BH-B340_13.15	SMGW-BH-B340_13.15	27/08/2021	291776.273	6257631.191	13.15	828808	-
BH-B340_19.15	SMGW-BH-B340_19.15	17/09/2021	291776.273	6257631.191	19.15	828808	-
BH-B340_23.16	SMGW-BH-B340_23.16	17/09/2021	291776.273	6257631.191	23.16	828808	-
BH-B343_0.1	SMGW-BH-B343_0.1	25/08/2021	292081.654	6257584.72	0.1	820391	<0.05
BH-B343_0.5	SMGW-BH-B343_0.5	25/08/2021	292081.654	6257584.72	0.5	820391	<0.05
BH-B343_1	SMGW-BH-B343_1	25/08/2021	292081.654	6257584.72	1	820391	<0.05
BH-B343_1.5	SMGW-BH-B343_1.5	25/08/2021	292081.654	6257584.72	1.5	820391	-
BH-B343_2-2.4	SMGW-BH-B343_2-2.4	25/08/2021	292081.654	6257584.72	2.4	820391	-
BH-B343_3-3.2	SMGW-BH-B343_3-3.2	25/08/2021	292081.654	6257584.72	3.2	820391	-
BH-B343_4-4.5	SMGW-BH-B343_4-4.5	25/08/2021	292081.654	6257584.72	4.5	820391	-
BH-B343_5	SMGW-BH-B343_5	25/08/2021	292081.654	6257584.72	5	820391	-
BH-B343_6.15	SMGW-BH-B343_6.15	25/08/2021	292081.654	6257584.72	6.15	820391	-
BH-B343_9.18	SMGW-BH-B343_9.18	25/08/2021	292081.654	6257584.72	9.18	820391	-
BH-B343_15.21	SMGW-BH-B343_15.21	25/08/2021	292081.654	6257584.72	15.21	820391	-
TP-B381_0.1	SMGW-TP-B381_0.1	17/08/2021	291799.558	6257537.16	0.1	818569	<0.05
TP-B381_1	SMGW-TP-B381_1	17/08/2021	291799.558	6257537.16	1	818569	-
TP-B381_2	SMGW-TP-B381_2	17/08/2021	291799.558	6257537.16	2	818569	-

Page 23

Page 37

Page 44

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