

Appendix B5

Construction Contaminated Land Management Sub-plan

M12 Motorway

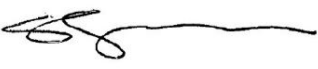
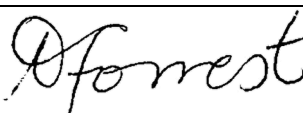
March 2023

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Document control

File Name	M12PPW-ADAP-ALL-EN-PLN-000043_J_S3_CCLMP
Title	M12 Motorway OCEMP Appendix B5 - Construction Contamination Land Management Sub-plan
Document Number (Teambinder)	M12PPW-ADAP-ALL-EN-PLN-000043

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
21/03/2023	21/03/2023
	

Revision history

Revision	Date	Description
A	25/09/2020	First draft for TfNSW review
B	28/10/2020	Response to TfNSW comments
C	16/11/2020	Response to TfNSW comments
D	27/07/2021	Updated with Final NSW and Commonwealth CoA
E	20/08/2021	Response to TfNSW and ER comments
F	10/09/2021	Response to TfNSW and ER comments
G	10/11/2021	Response to comments received during consultation
H	02/12/2022	Additional design changes updates
I	13/02/2023	Response to TfNSW comments
J	21/03/2023	Response to ER comments

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Glossary / Abbreviations

Term	Expanded text
ACM	Asbestos containing material
AEC	Areas of environmental concern
AEI	Area of Environmental Interest
AMP	Asbestos Management Plan
AR	Amendment Report
ARSR	Amendment Report Submissions Report
ASS	Acid Sulfate Soils
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CA	Consistency Assessment
CCLMP	Construction Contaminated Land Management Sub-plan
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CEvP(SC)	Certified Environmental Practitioner (Site Contamination)
CLM Act	<i>Contaminated Land Management Act 1997</i>
CLMP	Contaminated Land Management Plan
CoA	Conditions of Approval
Commonwealth CoA	Federal Conditions of Approval under the EPBC Act
Contaminated land	Land with the presence of a substance in, on or under the land at a concentration above that which it is normally found in that locality, such that there presents a risk of harm to human health or to the environment
Contamination high-risk activity	Work within excavations or confined spaces in locations where landfill gas exceedances have been previously identified
CoPC	Contaminants of Potential Concern
CPSS CSAM	Certified Professional Soil Scientist Contaminated Site Assessment and Management
CSSI	Critical State Significant Infrastructure
CSWMP	Construction Soil and Water Management Plan
CWRMP	Construction Waste and Resources Management Plan
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now Department of Climate Change, Energy, the Environment and Water)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
DPI	Department of Primary Industries
DPIE	Former Department of Planning, Industry and Environment (now NSW Department of Planning and Environment)

Term	Expanded text
DPE	NSW Department of Planning and Environment
EAD	Environmental Assessment Documentation
EIL	Ecological Investigation Levels
EIS	Environmental Impact Statement
EMS	Environmental Management System
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Change Consistency Assessment. The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW • Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
EPA	NSW Environment Protection Authority
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environmental Protection License
ER	Environmental Representative
ERG	Environmental Review Group
ESM	Transport for New South Wales Environment and Sustainability Manager
ESL	Ecological Screening Levels
ESR	Construction Contractor Environmental Site Representative
EWMS	Environmental Work Method Statement

Term	Expanded text
FCC	Fairfield City Council
Federal Approval	Approval (EPBC 2018/8286) for carrying out the M12 Project under Part 8 of the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> subject to specific CoA as detailed in Annexure A of the approval.
Final construction footprint	The area shown in the map(s) submitted under Commonwealth CoA 2, determined by TfNSW in accordance with a consistency assessment(s) or a modification assessment under the <i>NSW Environmental Planning and Assessment Act 1979</i> where no new significant impacts to protected matters are identified.
GIL	Groundwater Investigation Levels
HBM	Hazardous Building Materials
HSL	Health Screening Level
Hold Point	A point beyond which a work process must not proceed without express written authorisation from Transport for New South Wales
Infrastructure Approval	Approval (SSI 9364) for carrying out of the M12 Project under Section 5.19 of the <i>Environmental Planning and Assessment Act 1979</i> subject to specific CoA as detailed in Schedule 2 of the approval.
km	Kilometre
LBP	Lead based paint systems
LCC	Liverpool City Council
LCD	Lead containing dust
LTEMP	Long Term Environmental Management Plan
NEPM	<i>National Environment Protection (Assessment of Site Contamination) Measure (1999)</i>
NRAR	Natural Resources Access Regulator
Non-compliance	Failure to comply with the requirements of the Project approval or any applicable licence, permit or legal requirements
Non-conformance	Failure to conform to the requirements of Project system documentation including this OCEMP or supporting documentation
NSW CoA	NSW Conditions of Approval
OCEMP	Overarching Construction Environmental Management Plan
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PCB	Polychlorinated biphenyls
PCC	Penrith City Council
Planning Secretary	Secretary of the Department of Infrastructure, Planning and Environment, or delegate
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>

Term	Expanded text
PPE	Personal Protective Equipment
Primary CoA/REMM	CoA/REMM that are specific to the development of this Plan
Project, the	M12 Motorway
QA	Quality assurance
RAP	Remedial Action Plan
REMM	Revised Environmental Management Measure as provided in the Amendment Report
Roads and Maritime	Former NSW Roads and Maritime Services. Now Transport for NSW
SAR	Site Audit Report
SAS	Site Audit Statement
SEARs	Secretary's Environmental Assessment Requirements
Secondary CoA/REMM	CoA/REMM that are related to, but not specific to, the development of this Plan
SMART	Specific, Measurable, Achievable, Realistic and Timely
SMF	Synthetic mineral fibres
SWMS	Safe Work Method Statement
TfNSW	Transport for New South Wales
TRH	Total Recoverable Hydrocarbons
UXO	Unexploded ordnance
WHS Act	<i>Work Health and Safety Act (2011)</i>
Work	Any physical work to build or facilitate the building of the CSSI, including low impact work, environmental management measures and utility works. However, it does not include activities that inform or enable detailed design of the CSSI and generate noise that is no more than 5 dB(A) above the rating background level at any sensitive receiver.
WSIA	Western Sydney International Airport

1 Introduction

1.1 Context

This Construction Contaminated Land Management Sub-plan (CCLMP or Plan) forms part of the Overarching Construction Environmental Management Plan (OCEMP) for the M12 Motorway (the Project).

This CCLMP has been prepared to address the requirements of the Minister's Conditions of Approval (CoA), the Revised Environmental Management Measures (REMMs) listed in the M12 Motorway Environmental Impact Statement (EIS), Amendment Report, and Amendment Report Submissions report (ARSR), all applicable legislation and Transport for New South Wales (TfNSW) Quality Assurance (QA) specifications.

1.2 Background

TfNSW is planning to construct and operate the M12 Motorway to provide direct access between the Western Sydney International Airport (WSIA) at Badgerys Creek and Sydney's motorway network. The M12 Motorway will run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for about 16 kilometres (km) and is expected to be opened to traffic prior to opening of the WSIA.

The Project will be constructed in three separate stages under separate construction contracts:

- M12 West – between The Northern Road, Luddenham and about 250 metres east of Badgerys Creek
- M12 Central – between about 500 metres west of South Creek and the Western Sydney Parklands at Duff Road, Cecil Park
- M12 East – Elizabeth Drive connections at Cecil Park
- M12 East – the M7/M12 interchange.

The Project is subject to an approval under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The Project is also a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), requiring a separate approval from the Australian Minister for the Environment.

An EIS was prepared to describe and assess the Project and recommend management measures to address impacts. The EIS was exhibited by the NSW Department of Planning, Industry and Environment (DPIE; now Department of Planning and Environment) for 34 days from 16 October 2019 to 18 November 2019 to give the community and stakeholders the opportunity to provide comment.

In accordance with Section 5.17 of the EP&A Act, the Planning Secretary requested TfNSW to provide a Response to Submissions report on 29 November 2019. These were addressed within the Submission Report. Due to design developments since the exhibition of the EIS, an Amendment Report (AR) was developed to assess the impacts of these amendments. The AR was exhibited by DPIE for 14 days from 21 October 2020 to 4 November 2020. Following exhibition of the AR, an Amendment Report Submissions Report (ARSR) was developed in December 2020 to address the identified issues, followed by the ARSR – Amendment in March 2021 which addressed biodiversity matters only.

The following additional assessments have since been undertaken:

- Two Consistency Assessments (CA) for M12 West and Central addressing detailed design changes for the Project construction boundary approved in October 2021
- Sydney Water Consistency Assessment related to construction boundary extensions associated with Sydney Water utility crossings; approved in June 2022
- Design Boundary Change Consistency Assessment related to design boundary changes within the M12 alignment. This required an extension of the construction footprint and operational footprint, property adjustments and the demolition of Building No.1 at McMasters Field Station; approved in July 2022. Threatened Species Surveys were also undertaken along the M12 alignment between September and December 2021 to satisfy the NSW Conditions of Approval (CoA) E4, E5 and E6; the outcomes of which captured within the Design CA.
- Minor Consistency Assessment required amendments to the construction footprint as a result of utility adjustments and tie in works, property adjustments for flood alleviation and improvements to ancillary facility access due to safety concerns, temporary widening of Elizabeth Drive and signage installation; approved in August 2022.

The Project must be carried out generally in accordance with the EIS, Submissions Report, AR, ARSR, and the ARSR – Amendment, M12 West and Central CA, Sydney Water CA, Design Boundary Change CA and Minor CA in accordance with NSW CoA A1. These documents are collectively referred to as the Environmental Assessment Documentation (EAD). The CSSI must also be carried out in accordance with all procedures, commitments, preventative actions, performance outcomes and mitigation measures set out in the Environmental Assessment Documentation EAD as required by NSW CoA A2. The EIS assessed the impacts of areas of potential contaminated land during the construction of the Project. As part of EIS development, a detailed soils and contamination assessment report was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW DPIE and the Commonwealth EIS Guidelines issued by the Commonwealth Department of the Water, Agriculture and Environment (DAWE; now Department of Climate Change, Energy, the Environment and Water (DCCEEW)). The Soils and Contamination Assessment Report was included in the EIS as Appendix O.

Further assessment of contamination impacts was undertaken subsequent to exhibition of the EIS and incorporated into the Amendment Report. The additional assessment considered contamination impacts due to refinements in the Project design, including changes in the Project footprint and ancillary facilities. A soils and contamination supplementary technical memorandum was included in the Amendment Report as Appendix K.

REMMs were provided within the Amendment Report and further updated in the ARSR. Where applicable, the REMMs from the ARSR have been included in this CCLMP. Further, design development has progressed, providing additional environmental assessment, and where relevant, this detail has been included within this CCLMP.

The detailed project description is outlined in Section 2 of the OCEMP.

1.3 Scope of the Plan

The scope of this overarching CCLMP is to describe how the Construction Contractors propose to manage potential contamination impacts during construction of the Project. The Construction Contractor responsible for each stage of the Project (M12 West, M12 Central, both M12 East (Elizabeth Drive connections) and M12 East (M7/M12 interchange)) must use this CCLMP as the

basis for their stage-specific CCLMP. It is noted that management of acid sulphate soils (ASS) and soil salinity is discussed in the Construction Soil and Water Management Plan (CSWMP).

Operational contamination impacts and operation measures do not fall within the scope of this CCLMP and are therefore not included within the processes contained within the CCLMP.

The note in NSW CoA C4 allows for the combining of the CEMP Sub-plans. This CCLMP has been prepared as a stand-alone Sub-plan only addressing contaminated land management. Soil management will be addressed in the Construction Soil and Water Management Plan (CSWMP) combining NSW CoA C4 (d) and (e). Further detail is provided in the Staging Report.

The SMART (Specific, Measurable, Achievable, Realistic and Timely) principles have been considered in the preparation of this CCLMP.

1.4 Environmental Management Systems overview

The overarching Environmental Management System (EMS) for the Project is described in Section 3 of the OCEMP. The Construction Contractor delivering the Project will have an EMS, consistent with the overarching EMS described in the OCEMP. The Construction Contractor will develop stage-specific CCLMP in accordance with the OCEMP, the Environmental Protection License (EPL) and their EMS.

This overarching CCLMP forms part of the environmental management framework for the Project, as described in Section 3 of the OCEMP.

The Construction Contractors will be required to develop, as part of their stage-specific CCLMP, detailed procedures and plans to address specific requirements of the CoA and REMMs identified in this overarching CCLMP. The purpose of these environmental management documents in regard to minimisation and management of contamination associated with the Project, is outlined in Section 6 of this CCLMP.

Management measures identified in this CCLMP may also be incorporated into site or activity specific Environmental Work Method Statements (EWMS). EWMS incorporate appropriate mitigation measures and controls and identify key procedures to be used concurrently with the EWMS. A EWMS template for use by the Construction Contractors is provided in Appendix A8 of the OCEMP. EWMS will be prepared for the management of materials containing asbestos, and for any other high risk activities identified in the Construction Contractors environmental risk workshops. Appendix A8 also contains a template EWMS register and template EWMS training register.

EWMS will be prepared by the Construction Contractors Environmental Site Representative (ESR) and reviewed by the TfNSW Project Manager and TfNSW Environment and Sustainability Manager (ESM) (or delegate) and independent Environmental Representative (ER) prior to the commencement of the construction activities to which they apply. Construction personnel undertaking a task governed by an EWMS will undertake the activity in accordance with the mitigation and management measures identified in the EWMS.

Used together, the OCEMP, strategies, procedures and EWMS form management guides that clearly identify required environmental management actions for reference by TfNSW and its Construction Contractor.

1.4.1 CCLMP preparation, endorsement and approval

This overarching CCLMP has been prepared to satisfy the NSW CoA C4(d) in relation to contamination during construction of the Project.

This CCLMP will be reviewed by the TfNSW Senior Project Manager and the TfNSW Environment and Sustainability Manager (ESM) and endorsed by the ER prior to submission to the Planning

Secretary of DPE for approval. This CCLMP will be submitted for the approval of the Secretary no later than one month prior to commencement of construction of the Project, or as otherwise agreed by the Planning Secretary in accordance with NSW CoA C9.

In accordance with NSW CoA C10, construction of the Project will not commence prior to approval of the CCLMP by the Planning Secretary.

1.4.2 Interactions with other management plans

This Plan has the following interrelationships with other management plans and documents:

- The CSWMP addresses the management of ASS, salinity and erosion and sedimentation associated with the Project
- The CSWMP contains a Construction Soil and Water Monitoring Program. Relevant contaminated land information from this overarching CCLMP has been incorporated into the Monitoring Programs to inform the monitoring activities to be undertaken during construction of the Project
- The Construction Waste and Resources Management Plan (CWRMP) provides a framework for waste management.

1.5 Consultation

1.5.1 Consultation for preparation of the CCLMP

The following government agencies and stakeholders were consulted with during the development of this CCLMP, in accordance with NSW CoA C4(d):

- DPE Water ((Natural Resources Access Regulator) (NRAR) as delegate)
- Water NSW
- Penrith City Council (PCC)
- Liverpool City Council (LCC)
- Fairfield City Council (FCC).

It is noted that although NSW CoA C4(d) requires consultation with DPE Water, consultation has been completed through NRAR. This is deemed appropriate, as NRAR formed part of the NSW Government's reform of water management and is considered an independent regulator for compliance and enforcement of water management legislation in NSW.

In accordance with NSW CoA A5(b), Table 1-1 provides a log of engagement or attempted engagement with the identified government agencies and stakeholders.

Table 1-1: Log of engagement with government agencies and stakeholders

Agency	Date	Person Contacted	Comment	Consultation Status
DPE Water (NRAR)	10 September 2021	NRAR Representative	TfNSW emailed CCLMP to NRAR requesting comment.	Open
	27 September 2021	NRAR Representative	TfNSW followed up the NRAR Representative via phone and received no response.	Open

Agency	Date	Person Contacted	Comment	Consultation Status
	8 November 2021	TfNSW Representative	Response received from NRAR via email (See Appendix A) accepting the CCLMP. Consultation closed.	Closed
Water NSW	10 September 2021	Water NSW Representative	TfNSW emailed CCLMP to Water NSW requesting comment.	Open
	27 September 2021	TfNSW Representative	Response received from Water NSW via email (See Appendix A) accepting the CCLMP. Consultation closed.	Closed
Fairfield City Council	10 September 2021	FCC Representative	TfNSW emailed CCLMP to FCC requesting comment.	Open
	27 September 2021	TfNSW Representative	Response received from FCC via email (See Appendix A) accepting the CCLMP. Consultation closed.	Closed
Penrith City Council	10 September 2021	PCC Representative	TfNSW emailed CCLMP to PCC requesting comment.	Open
	27 September 2021	PCC Representative	TfNSW followed up the PCC Representative via phone and received no response.	Open
	7 October 2021	PCC Representative	PCC Representative notified that consultation has been closed.	Closed
Liverpool City Council	10 September 2021	LCC Representative	TfNSW emailed CCLMP to LCC requesting comment.	Open
	29 September 2021	LCC Representative	TfNSW followed up the LCC Representative via email and received no response.	Open
	7 October 2021	LCC Representative	TfNSW contacted the LCC Representative via phone, who indicated that will send through comments in the following week (11/10/2021).	Open
	14 October 2021	LCC Representative	LCC Representative notified that consultation has been closed.	Closed

In accordance with NSW CoA C4 and A5, the consolidated evidence of consultation undertaken for the preparation of this CCLMP will be submitted to the Planning Secretary as part the document submission (refer to Appendix A). The consolidated evidence of consultation includes:

- Documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval
- Documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations
- Outline of the issues raised by the identified party and how they have been addressed
- Description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.

1.5.2 Ongoing consultation during construction

Consultation between TfNSW and its Construction Contractors, and stakeholders, the community and relevant agencies regarding the management of contaminated land will be undertaken during the construction of the Project as required. This includes notification to affected resident/s or business owner/s prior to excavation or removal of asbestos or asbestos containing material (ACM) in the vicinity of any occupied residence or business. The process for the consultation will be documented in the Overarching Communication Strategy (OCS).

2 Purpose and objectives

2.1 Purpose

The purpose of this CCLMP is to establish a set of best practice procedures to be undertaken by the Construction Contractors for the identification and management of contaminated land during construction for the Project.

This CCLMP only provides the management of contaminated land during construction. The CCLMP does not include the management of soil impacts from construction. This information is included in the CSWMP.

2.2 Objectives

The key objective of this CCLMP is to ensure all REMMs and licence/permit requirements relevant to contaminated land are described, scheduled and assigned responsibility as outlined in:

- Environmental Assessment Documentation
- TfNSW QA Specifications G36 and R44
- All relevant legislation and other requirements described in Section 3.1 of this Plan.

2.3 Targets

Targets for the management of contaminated land during the Project have been established to enable compliance with relevant legislative requirements, CoA and environmental management measures. These targets and how they will be measured are outlined in Table 2-1.

Table 2-1: Targets for the management of contaminated land during construction

Target	Measurement tool
Compliance with the relevant legislative requirements and REMMs	• Compliance Monitoring Program
No degradation to the receiving environment as a result of disturbance of contaminated land	• Construction Contractor's register of contaminated sites • Register of Environmental Incidents
Notification of any contamination uncovered during construction	• Site notifications
Ensure project personnel are informed via toolbox talks and the Project induction to enable the identification of potentially contaminated land	• Induction and training records
Minimise impacts on, and complaints from, the community and stakeholders.	• Complaints Register

3 Environmental Requirements

3.1 Relevant legislation, guidelines, reports and advice

3.1.1 Legislation and regulatory requirements

Legislation and regulations relevant to this CCLMP includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Contaminated Land Management Act* (1997) (CLM Act)
- *Protection of the Environment Operations Act* (1997) (POEO Act)
- Protection of the Environment Operations (Waste) Regulation (2014)
- National Environment Protection (Assessment of Site Contamination) Measure (1999) (NEPM)
- *Environmentally Hazardous Chemicals Act* 1985
- Environmentally Hazardous Chemicals Regulation 2008
- *Pesticides Act* 1999
- Pesticides Regulation 2009
- *Work Health and Safety Act* (2011) (WHS Act)
- Work Health and Safety Regulation (2017).

Relevant provisions of the above legislation are identified in the register of legal requirements included in Appendix A1 of the OCEMP.

3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this Plan include:

- *Acid Sulfate Soils Assessment Guidelines* (Department of Planning, 2008)
- *Acid Sulfate Soil Manual* (Acid Sulfate Soils Management Advisory Committee, 1998)
- *Australian Drinking Water Guidelines* (ADWG, 2011)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018)
- Australian Standard (AS 4482.1-2005) Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds
- Australian Standard (AS 4482.2-1999) Guide to the sampling and investigation of potentially contaminated soils – Volatile substances
- Australian Standard (AS 2601-2001): The demolition of structures
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (Department of Environment and Conservation NSW, 2007)
- *Cooperative Research Centre for Contamination Assessment and Remediation of the Environment: Technical Report No. 10, Health Screening Levels for Petroleum*

Hydrocarbons in Soil and Groundwater Part 1: Technical development document, 2011 (CRC Care, 2011)

- *Environmental Procedure Management of Wastes on Transport for New South Wales Services Land* (Roads and Maritime, 2014)
- *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2000)
- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (Environment Protection Authority, 2015)
- *Guidelines for the Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008* (Department of Environment and Climate Change NSW, 2009)
- *Information for the assessment of former gasworks sites* (Department of Environment and Conservation NSW, 2005)
- *Landslide risk management guidelines presented in Australian Geotechnics Society* (2007)
- *Managing asbestos in or on soil* (SafeWork NSW, 2014)
- *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning & Environment Protection Authority 1998)
- *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (Department of Environment and Climate Change NSW, 2008)
- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (as revised 2013) (NEPM, 2013)
- *National Health and Medical Research Council, Guidelines for Managing Risks in Recreational Water* (NHMRC, 2008)
- Other guidelines made or approved under section 105 of the Contaminated Land Management Act 1997
- *PFAS - National Environmental Management Plan Version 2.0* (HEPA, January 2020)
- *Roads and Maritime Environmental Procedure – Management of Wastes on Roads and Maritime Services Land* (August 2014)
- *Roads and Maritime Guideline for the Management of Contamination* (September 2013)
- *Roads & Maritime Services Environmental Incident Classification and Reporting Procedure* (2017)
- *Soil and Landscape Issues in Environmental Impact Assessment* (Gray, 2000)
- *The NSW EPA (2014b) Best Practice Note: Landfarming*
- *The NSW EPA (1995) Contaminated Sites: Sampling Design Guidelines*
- *The NSW EPA (2017) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (3rd Edition) (updated from NSW EPA 2006 version)*
- *The NSW EPA (2012) Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases*

- *The NSW EPA (2015b) Technical Note: Light Non-Aqueous Phase Liquid Assessment and Remediation*
- *The NSW EPA (2014a) Technical Note: Investigation of Service Station Sites*
- *The NSW EPA (2014) Waste Classification Guidelines*
- *The NSW EPA (2014) Addendum to the Waste Classification Guidelines – Part 1: classifying waste*
- *Urban and regional salinity guidance given in the Local Government Salinity Initiative booklets which includes Site Investigations for Urban Salinity (DLWC, 2002)*
- *Vapour Intrusion: Technical Practice Note (Department of Environment, Climate Change and Water NSW, 2010)*
- *How to manage and control asbestos in the workplace – Code of Practice (Safe work Australia, July 2020)*
- *How to safely remove asbestos – Code of Practice (Safe Work Australia, July 2020)*

3.1.3 Reports and advice

The following reports and advice relating to contaminated land have been considered during the preparation of this plan:

- M12 Motorway Central – Detailed Design Landfill Gas Monitoring Report M12CSS-GHDA-ALL-CT-RPT-000014 (GHD, 2021)
- M12 Motorway Central - Detailed Design Remedial Action Plan M12CDD-GHDA-ALL-CT-RPT-000013 (GHD, 2021)
- M12 Motorway Central - Detailed Design Contamination Investigation Report M12CDD-GHDA-ALL-CT-RPT-000010 (GHD, 2020)
- M12 Motorway Central – Detailed Design Acid Sulphate Soils And Salinity Management Plan M12CDD-GHDA-ALL-GE-PLN-000011 (GHD, 2021)
- M12 Motorway Central – Detailed Design Hazardous Building Material Survey M12CDD-GHDA-ALL-RM-RPT-000002 (GHD, 2020)
- Department of Primary Industries advice regarding Residual risks associated with Salmonella Enteritidis on the portion of land acquired by Transport NSW at 146B Clifton Avenue, Kemps Creek 2178 (ref: CM9OUT21/10535), dated 3 August 2021
- M12 Motorway West – Detailed Design Remedial Action Plan M12WDD-WSPA-ALL-GE-RPT-000008 (WSP, 2021)
- M12 Motorway West – Detailed Design Contamination Investigation Report M12WDD-WSPA-ALL-GE-RPT-000006 (WSP, 2020)
- M12 Motorway – Detailed Design, Hazardous Building Materials Assessment (GHD, 2021)
- M12 Motorway West – Detailed Design M12WDD-WSPA-ALL-EN-RPT-000008 Hazardous Building Material Survey (GHD, 2020)
- M12 Motorway–Detailed Design Creek sediment contamination assessment M12CDD-GHDA-ALL-CT-RPT-000015 (GHD, 2021).

3.2 Ministers Conditions of Approval

The primary NSW CoA relevant to the development of this CCLMP are listed in Table 3-1. Secondary CoA relevant to this CCLMP have been listed in Appendix B. A cross reference is also included to indicate where the CoA is addressed in this CCLMP or other project management documents.

Table 3-1: Primary NSW CoA

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
A5	Where the terms of this approval require a document or monitoring program to be prepared or a review to be undertaken and submitted to the Planning Secretary, and the terms of this approval require the document, monitoring program or review to be prepared/undertaken in consultation with identified parties, evidence of the consultation must be submitted to the Planning Secretary with the relevant document, monitoring program or review. The evidence must include: (a) documentation of the engagement with the party identified in the condition of approval that has occurred before submitting the document for approval; (b) a log of the dates of engagement or attempted engagement with the identified party; (c) documentation of the follow-up with the identified party where engagement has not occurred to confirm that they do not wish to engage or have not attempted to engage after repeated invitations;" (d) outline of the issues raised by the identified party and how they have been addressed; and (e) a description of the outstanding issues raised by the identified party and the reasons why they have not been addressed.	✓	✓	✓	Section 1.5.1 Appendix A
C2	The CEMP must provide:				

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	(h) a list of all the CEMP Sub-plans required in respect of construction, as set out in Condition C4. Where staged construction of the CSSI is proposed, the CEMP must also identify which CEMP Sub-plan applies to each of the proposed stages of construction;	✓	✓	✓	Section 1.4
	(k) for periodic review and update of the CEMP and all associated plans and programs; and	✓	✓	✓	Section 8.2
C4	The following CEMP Sub-plans must be prepared in consultation with the relevant agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be included in the relevant CEMP Sub-plan, including copies of all correspondence from those agencies. (d) Soils and contamination - DPE Water, WaterNSW and relevant council(s)	✓	✓	✓	Section 1.5.1 Appendix A
C5	The CEMP Sub-plans must state how:				
	(a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	✓	✓	✓	Section 2.3
	(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;	✓	✓	✓	Section 3.2 Section 3.3
	(c) the relevant terms of this approval will be complied with; and	✓	✓	✓	Section 3.2
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART (Specific, Measurable, Achievable, Realistic and Timely) principles.	✓	✓	✓	Section 1.3

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
C9	Any of the CEMP Sub-plans may be submitted to the Planning Secretary for approval along with, or subsequent to, the submission of the CEMP but in any event, no later than one (1) month before the commencement of construction	✓	✓	✓	Section 1.4.1
C10	Construction must not commence until the CEMP and all CEMP Sub-plans have been approved, unless otherwise agreed by the Planning Secretary. The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the ER must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the CEMP and sub-plans for that stage have been endorsed by the ER and approved by the Planning Secretary.	✓	✓	✓	Section 1.4.1

3.3 Revised Environmental Management Measures

The primary REMMs relevant to the development of this CCLMP are listed in Table 3-2 below. Secondary REMMs relevant to this CCLMP are listed in Appendix B. A cross reference is also included to indicate where the REMM is addressed in this CCLMP or other project management documents.

Table 3-2: Primary REMMs

ID	Revised Environmental Management Measure	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
SC03	A Contaminated Land Management Plan (CLMP) will be prepared for the project. The CLMP will include:	Prior to construction	✓	✓	✓	This Plan
	Control measures to manage identified areas of contamination, including surface soils in the vicinity of TP303, TP304, TP310 and TP311 containing heavy metal and polycyclic aromatic hydrocarbons (PAH) concentrations					Section 4.1.1 Section 6.1.1 Section 6.7
	Procedures for unexpected contamination					Section 6.6 Appendix C
	Measures to manage potential ASS (as required based on testing results) within sediments of the creeks in the construction footprint to minimise impacts to the environment					CSWMP
	Requirements for excavation of unexpected contaminants to be carried out in consultation with project Remedial Actions Plans.					Section 6.2 Section 6.7 (CL7)
	Requirements for the disposal of contaminated waste in accordance with the POEO Act and the Protection of the Environment Operations (Waste) Regulation 2014.					Section 6.7 (CL14)

ID	Revised Environmental Management Measure	Timing	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
SC04	An Asbestos Management Plan (AMP) will be prepared as part of the CLMP for the project. The AMP will guide the excavation, handling, storage and disposal of management of asbestos discovered during construction, including procedures for any unexpected asbestos. The AMP will also outline requirements for the encapsulation of asbestos to be carried out in accordance with project Remedial Action Plans.	Prior to construction	✓	✓	✓	Section 6.1.2 Appendix D

3.4 TfNSW QA Specifications

The TfNSW QA Specifications set out the minimum requirements for the detailed outcomes in terms of quality or performance expected in the finished product for construction projects and are relevant to various construction activities on work sites to minimise impacts to the environment. The TfNSW QA Specifications are Project contract documents and are not publicly accessible.

The Construction Contractor will incorporate the appropriate M12 TfNSW QA Specifications into the stage specific CCLMPs including the requirements from, but are not limited to:

G36 – Environmental Protection

R44 – Earthworks.

The specifications set out environmental protection requirements, including Hold Points that must be complied with by the Construction Contractors during construction of the Project. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from TfNSW.

4 Existing Environment

This section describes the existing environment of the Project specific to contaminated land. This section has been developed based on information from the Environmental Assessment Documentation and ongoing contamination assessments being undertaken during detailed design (refer to Section 3.1.3). The Construction Contractor must review all documentation pertinent to contaminated land in the development of the stage-specific CCLMP.

4.1 Summary of Environmental Assessment Documentation

4.1.1 Areas of Environmental Interest

Areas of environmental interest (AEI) are areas that could potentially impact soil and groundwater as a result of historic and/or current activities. Potential AEIs were identified during preparation of the Environmental Assessment Documentation.

Table 4-1 outlines the potential AEIs located in the vicinity of the Project and their associated risks to environmental receptors, construction limitations, and site users in consideration of the potential for contamination and proposed construction activities.

The majority of the potential AEIs identified were assessed as being at a low risk of exposure during construction of the Project, as construction activities are unlikely to be undertaken at these sites. The locations of the AEIs with moderate to high exposure risk ratings are presented in Figure 4-2. The AEIs are also shown in Figure 4-1 and the Sensitive Area Maps included in Appendix A6 of the OCEMP.

The Environmental Assessment Documentation outlines that heavy metal and polycyclic aromatic hydrocarbons (PAH) contamination has also been detected at concentrations exceeding ecological investigation levels within surface soils at selected locations (TP303, TP304, TP310 and TP311).

Table 4-1: Areas of environmental interest identified in the Environmental Assessment Documentation

Figure Ref	AEI	Location	Project Section	Potential contaminants of concern	Potential contamination distribution	Risk Rating
1	Caltex Service Station	The Northern Road, Luddenham	M12 West	Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), PAH, heavy metals	Soil, groundwater, soil vapour	Low
C	Luddenham Raceway	821 – 849 Luddenham Road, Luddenham	M12 West	TRH, BTEX, heavy metals	Soil (surface)	Low
2	Caltex Service Station	1163 Mamre Road, Kemps Creek	M12 Central	TRH, BTEX, PAH, heavy metals	Soil, groundwater, soil vapour	Low
3	BP Service Station	Corner of Elizabeth Drive and Salisbury Avenue	M12 Central	TRH, BTEX, PAH, heavy metals	Soil, groundwater, soil vapour	Low
4	Brandown Quarry	Lot 90 Elizabeth Drive, Kemps Creek	M12 Central	Heavy metals, TRH, BTEX, acids, sulphate, cyanide	Soil, groundwater	Low
5	Sydney International Shooting Centre	Range Road, Kemps Creek	M12 Central	Lead, unexploded ordnance (UXO)	Soil	Low
6	PGH Bricks and Pavers	Cecil Road, Cecil Park	M12 East	Heavy metals, TRH, BTEX, acids, sulphate, cyanide	Soil	Moderate

Figure Ref	AEI	Location	Project Section	Potential contaminants of concern	Potential contamination distribution	Risk Rating
7	Area of waste and imported fill	Lot 17 Clifton Avenue, Kemps Creek	M12 Central	TRH, BTEX, PAH, heavy metals, Organophosphorus Pesticides (OPP), Organochlorine Pesticides (OCP), Polychlorinated biphenyls (PCB) and asbestos	Soil, groundwater	Moderate
8	Hi-quality Quarry	1503 – 1509 Elizabeth Drive, Kemps Creek	M12 Central	Heavy metals, TRH, BTEX, acids, sulphate, cyanide	Soil, groundwater	Low
9	Sydney Recycling Park/Wanless Recycling & Former Kari & Ghossayn Pty Ltd (Solid Waste Landfill)	16-23 Clifton Avenue, Kemps Creek	M12 Central	TRH, BTEX, ammonia, PAH, heavy metals, OCP, OPP, PCB, nutrients, asbestos	Soil, groundwater, gas	Moderate
10	SUEZ Kemps Creek Resource Recovery Park	1725 Elizabeth Drive, Kemps Creek	M12 Central	TRH, BTEX, ammonia, PAH, heavy metals, OCP, OPP, PCB, nutrients, asbestos	Soil, groundwater, gas	Moderate
11	Australian Native Landscapes (ANL)	210 Martin Road, Badgerys Creek	M12 Central	TRH, BTEX, OCP, OPP, heavy metals, carbamates	Soil	Low
12	Luddenham Broiler Farm (Baiada Poultry)	2907 The Northern Road, Luddenham	M12 West	OCP, OPP, herbicides, carbamates, nitrates, heavy metals, nutrients	Soil	Low
13	Andreasens Green Wholesale Nursery	1543 Elizabeth Drive, Kemps Creek	M12 Central	Heavy metals, OCP, OPP, carbamates, TRH, BTEX	Soil	Low
14	Blue Sky Mining	2420 Elizabeth Drive, Luddenham	M12 West	Heavy metals, TRH, BTEX, acids, sulphate, cyanide	Soil, groundwater	Low

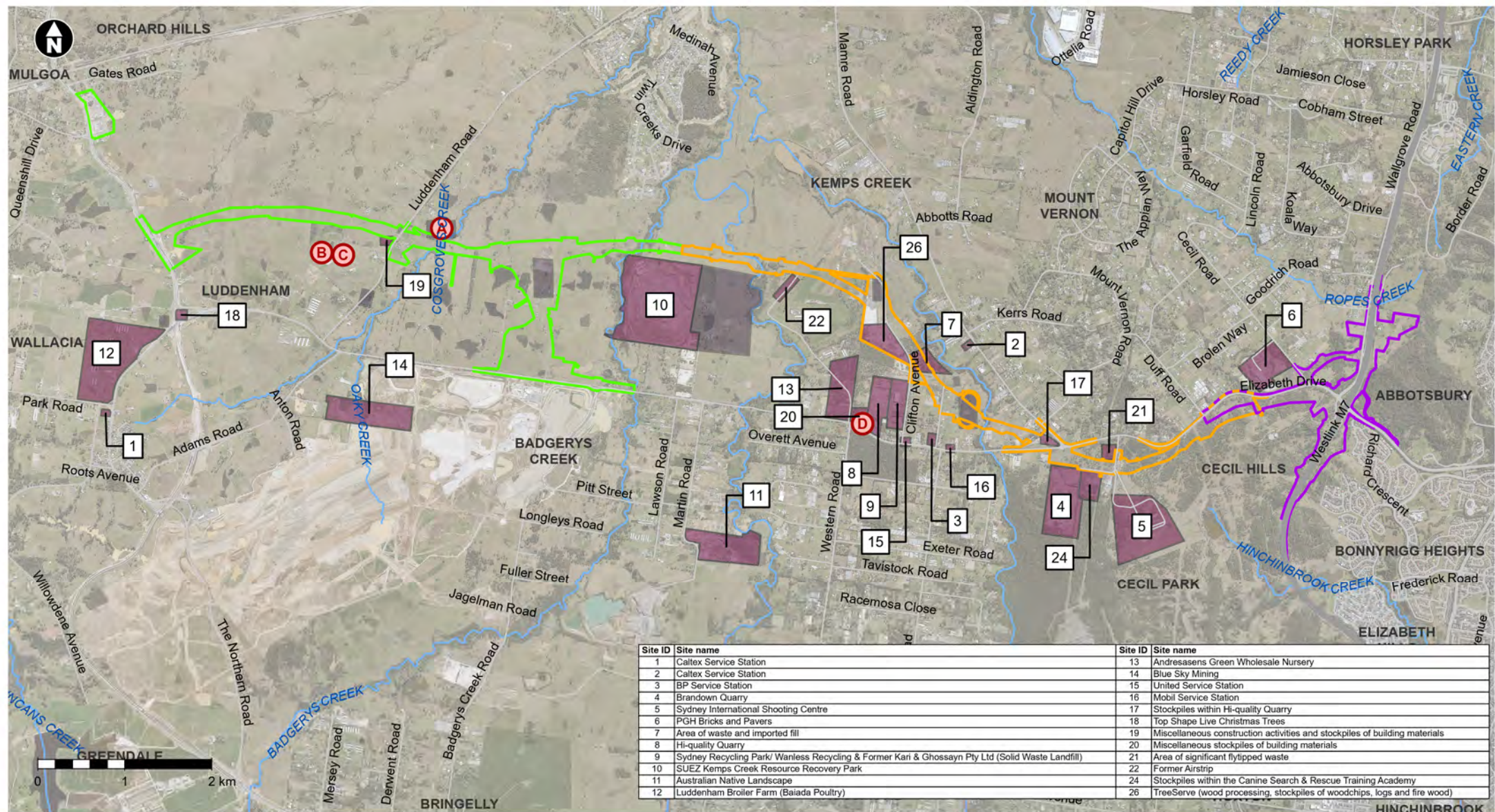
Figure Ref	AEI	Location	Project Section	Potential contaminants of concern	Potential contamination distribution	Risk Rating
15	United Service Station	Corner Elizabeth Drive and Clifton Avenue	M12 Central	TRH, BTEX, PAH, heavy metals	Soil, groundwater, soil vapour	Low
16	Mobil Service Station	Lot A Elizabeth Drive, Kemps Creek	M12 Central	TRH, BTEX, PAH, heavy metals	Soil, groundwater, soil vapour	Low
17	Stockpiles within Hi-quality Quarry Group Head Office	Corner Elizabeth Drive and Mamre Road, Kemps Creek	M12 Central	Heavy metals, TRH, BTEX, acids, sulphate, cyanide	Soil	Moderate
18	Top Shape Live Christmas Trees	2450 The Northern Road, Luddenham	M12 West	Heavy metals, OCP, OPP, carbamates, TRH, BTEX	Soil	Low
19	Miscellaneous construction activities and stockpiles of building materials ¹	Luddenham Road, Luddenham	M12 West	Heavy metals, BTEX, asbestos, TRH, OCP, OPP, PAH	Soil	High
20	Miscellaneous stockpiles of building materials	1521 Elizabeth Drive, Kemps Creek	M12 Central	Heavy metals, BTEX, asbestos, TRH, OCP, OPP, PAH	Soil	Low

¹ Upon reassessment, it is concluded that AEI 19 is unlikely to extend into the road reserve; the boundary has been adjusted to align with the road reserve/property boundary because:

1. The original mapping within the Environmental Assessment Documentation was at low resolution and did not accurately map the relevant property
2. AEI19 was identified as a contamination risk due to stockpiles related to the historic use of the property which contained asbestos and slag. Luddenham Road was built in the 1800s therefore, the road reserve has not cut through land subject to recent agricultural use.

Figure Ref	AEI	Location	Project Section	Potential contaminants of concern	Potential contamination distribution	Risk Rating
21	Area of illegally dumped material	Corner of Elizabeth Drive and Range Road, Kemps Creek	M12 Central	Heavy metals, BTEX, asbestos, PAH, OCP, OPP, PCB, TRH	Soil	High
22	Former airstrip	Western Road, Kemps Creek	M12 Central	Heavy metals, BTEX, PAH, TRH	Soil	Low
23	CPB Contractors Pty Limited- Road construction	The Northern Road Upgrade – Stage 5 & 6 Between Eaton Road, Luddenham and Glenmore Parkway, Orchard Hills and The Northern Road Upgrade – Stage 6 Between Littlefields Road and Eaton Road, Luddenham	M12 West	Heavy metals, TRH, BTEX, PAH, OCP, OPP, asbestos	Soil	Low
24	Stockpiles within the OzSource property	Range Road, Cecil Park	M12 Central	Heavy metals, BTEX, asbestos, PAH, OCP, OPP, PCB, TRH associated with stockpiled material	Soil	Moderate
25	Large area of fill placed in stockpiles	2161-2177 Elizabeth Drive, Luddenham	M12 West	Heavy metals, BTEX, asbestos, PAH, OCP, OPP, PCB, TRH associated with stockpiled fill material	Soil	Low
26	TreeServe (wood processing, stockpiles of woodchips, logs and fire wood)	90 Clifton Avenue, Kemps Creek	M12 Central	Heavy metals, BTEX, PAH, TRH, VOC associated with the onsite, processing of wood products (i.e. woodchips, large logs and firewood) and machinery/plant used to handle and process the wood.	Soil	Moderate

Figure Ref	AEI	Location	Project Section	Potential contaminants of concern	Potential contamination distribution	Risk Rating
Shown as 'Potential areas of existing fill'	Potential areas of existing fill	Generic AEIs along the project	All	Heavy metals, BTEX, asbestos, PAH, OCP, OPP, PCB, TRH	Soil, groundwater	High
N/A	Historical and current Agricultural land use	Generic AEIs along the project	All	Heavy metals, OCP, OPP, nutrients, BTEX, carbamates, herbicides	Soil (surface)	Low
N/A	Historical uncontrolled Earthworks containing asbestos and buildings/structures containing asbestos previously demolished/degraded	Generic AEIs along the project	All	Asbestos	Soil (surface)	High



Project construction boundary (EAD, Nov 2022)

- M12 West
- M12 Central
- M12 East
- Potential areas of existing fill

- Areas of environmental interest
- Existing motorway
- Existing road
- ~ Waterways

Site inspection reference location

- A A - Horse/dog track
- B B - Construction associated with plantation
- C C - Go kart track
- D D - Construction site

Imagery: Aerometrex August 2020

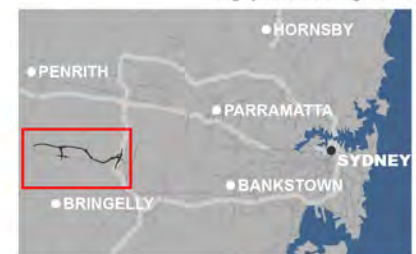
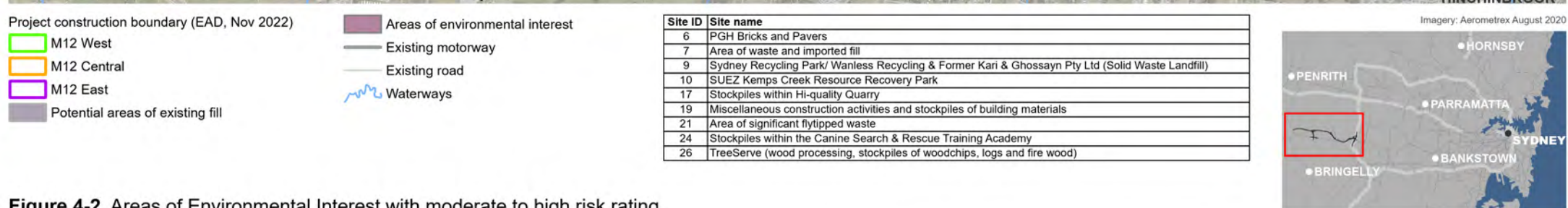


Figure 4-1 Areas of Environmental Interest



Date: 15/11/2022 Path: C:\Users\gcruz2278\ARCADIS\30058484 - M12 Motorway DCEMP - 00 GIS\A_Current\B_Maps\ManagementPlans\G30058484_CCLMP_A4L_v1.aprx
Created by: GC QA by: RB

4.2 M12 Central Detailed Design Progression

The below sections outline the detailed design progression and investigations related to contamination which are associated with M12 Central only.

4.2.1 Contamination Assessment

Site investigations were completed in 2021 by GHD for the purposes of due diligence for property and land acquisition. Additional contamination data was also collected opportunistically during geotechnical investigations. A summary of the contamination assessment within the construction boundary is summarised below:

- Fourteen Areas of Environmental Concern (AECs) were identified within the construction boundary, some of which correspond with the AEIs identified in the Environmental Assessment Documentation. The location of these AECs are provided in Appendix A of the M12 Motorway - Central Package Detailed Design: Contamination Investigation Report (GHD, 2021)
- Concentrations of contaminants of potential concern (CoPC) in all analysed soil, farm dam sediment and soil bund samples were reported below the adopted health screening criteria. Asbestos was not detected as presence/absence in any soil or sediment samples
- Concentrations of CoPC were generally reported below the generic Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for a commercial/industrial land use, with the exception of zinc in various samples and nickel
- Analytical results suggest that the majority of sampling locations these exceedances are likely to represent the naturally occurring conditions in these soils and not considered to represent a potential risk to the ecology of the area under the proposed future commercial/ industrial land uses
- Analytical results for groundwater samples were within the adopted health screening criteria for the vapour inhalation pathway (commercial / industrial)
- ACM and petroleum hydrocarbons were present within the construction footprint
- Metal concentrations detected in groundwater samples were representative of background groundwater quality. However, ammonia concentrations at four monitoring locations (BH219, BH222, BH742 and BH901) exceeded the freshwater ecological criterion within the construction footprint
- A potential biological health risk (related to salmonella contamination) was identified at a property on Clifton Avenue in Kemps Creek, however consultation with the Department of Primary Industries (DPI) found that the residual health risk to construction contractors and other visitors is considered to be extremely low.
- Metal concentrations in farm dam samples exceeded the adopted freshwater ecological criteria.

As per the requirements of REMM SC05, further soil investigations have been undertaken within:

- AEI6: PGH Bricks and Pavers
- AEI9: Sydney Recycling Park/ Wanless Recycling and Former Kari & Ghossayn Pty Ltd (Solid Waste Landfill)
- AEI10: SUEZ Kemps Creek Resource Recovery Park.

Concentrations of CoPC were reported below the generic EILs and ESLs for a commercial/industrial land use for soil samples collected within the construction footprint adjacent

AEI6 except for one sample with marginal exceedances of zinc concentrations (TP905). Investigations pertinent to AEI9 and AEI10 are discussed in Section 4.2.2.

The recommendations from this contamination assessment have been adopted within the environmental mitigation and management measures in Section 6.

4.2.2 Landfill gas monitoring

Four rounds of gas monitoring were completed from August 2020 to May 2021 (GHD, 2021) within the construction footprint adjacent to AEI9 and AEI10. The monitoring results indicate that:

- No methane, carbon monoxide or hydrogen sulphide concentrations exceeding the nominated assessment criteria were identified in any of the monitored wells over the four monitoring rounds. This indicates that at the times of monitoring, risks associated with these gases were likely to be relatively low in the vicinity of the project area
- Carbon dioxide concentrations exceeding the nominated assessment criterion were identified in a number of wells on several occasions. This indicates that at the time of monitoring, risks of potential concern associated with carbon dioxide in the ground and/or groundwater existed in the vicinity of the project area. It is currently unknown if the detected carbon dioxide is derived from the nearby landfill sites / fill areas or from other sources (for example the natural geology).
- Flow rates were relatively low at all monitored wells across all four monitoring rounds. This indicates that at the times of monitoring, significant pressure driven sub-surface gas flow was not occurring in the vicinity of the project area.

Due to the location of AEI10, the above gas monitoring results are also pertinent to M12 West. See Section 6.1.4 for further soil gas investigations required.

4.2.3 Hazardous building material audits

GHD completed a Hazardous Building Materials (HBM) assessment (GHD, 2021) and compiled a HBM Register for selected properties located within the Project. These properties were located off Salisbury Avenue and Clifton Avenue in Kemps Creek, NSW.

An HBM pre-demolition assessment was completed prior to demolition or partial demolition of these structures. The objective of the HBM pre-demolition assessment was to locate and assess HBM within the building, as far as reasonably practicable, and provide a risk assessment for the purpose of demolition of the nominated structures.

For the purpose of the assessment, HBM have been limited to:

- ACM
- Lead based paint systems (LBP) and lead containing dust (LCD)
- Synthetic mineral fibres (SMF)
- Polychlorinated biphenyls (PCBs).

A number of HBM were identified including ACM, LBP, PCBs and SMF. A register containing details of HBM identified at each of the surveyed properties was also completed (refer to Appendix A of the M12 Motorway – Detailed Design Hazardous Building Materials Assessment (GHD, 2021)).

4.2.4 Creek sediment contamination assessment

A sediment contamination assessment was completed across all stages of the Project by the overarching surface water quality consultant (GHD, 2021). The works included sampling from five

creeks (Kemps Creek, South Creek, Badgerys Creek, Cosgrove Creek and Ropes Creek) intersecting with the construction footprint, where sediment will likely be disturbed during the construction.

Based on the analytical results, the potential human health risks from exposure to the sediment within the Project footprint is considered to be low.

4.2.5 RAPs

A Draft Remedial Action Plan (RAP) was completed in June 2021 by GHD for the M12 Motorway Central - Detailed Design. The Draft RAP recommended on-site remediation of bonded ACM impacted soil within the road alignment, and offsite disposal of petroleum hydrocarbon impacted soils, with the intention that the contamination identified will be efficiently managed to achieve an environmentally sustainable outcome. The Draft RAP also outlined that the Project area can be made suitable for use as a motorway. The validation works described in the Draft RAP will allow for the effective implementation of the RAP in accordance with the remediation objectives. The M12 Central Construction Contractor will be required to develop their own RAP, with consideration to the recommendations included in the Draft RAP prepared during detailed design.

Refer to Section 6.2 for further detail on preparation of the RAP(s).

4.3 M12 West Detailed Design Progression

The below sections outline the detailed design progression and investigations related to contamination which are associated with M12 West only.

4.3.1 Contamination Assessment

Site investigations were completed in 2021 by WSP during a programme of geotechnical investigations for the detailed design phase of the Project. These investigations were undertaken at selected locations such as areas of proposed earthworks, bridge and drainage structures, and retaining walls along the alignment to inform detailed design. Additional contamination data was also collected opportunistically during geotechnical investigations. A summary of the contamination assessment is provided below:

- The results for chemical analysis from all soil samples analysed were reported to be below the site assessment criteria for a recreational/open space land use
- Elevated concentration of the CoPC were identified in sediment samples collected from the base of Farm Dams 1, 2, 6, 8 and 9 including concentrations of PAH exceeding the site assessment criteria
- Concentrations of all heavy metals in all groundwater samples analysed were below the Groundwater Investigation Levels (GILs) with the exception of the following which exceeded the freshwater ecological criterion:
 - Copper in samples BH117, P1-BH414, P1-BH421
 - Nickel in all samples analysed
 - Zinc in samples BH117, P1-BH204, P1-BH209, P1-BH414 and P1-BH421
 - Cadmium in BH117
- The heavy metal concentrations detected within groundwater samples were considered to be attributable to background conditions within the aquifer as there was no indication of a point source on site

- Ammonia concentrations at two groundwater monitoring locations (BH204 and P1-BH414) exceeded the freshwater ecological criterion within the construction footprint
- ACM was identified in shallow soil during test pitting at one location (P1-TP453) and therefore exceeded Health Screening Level (HSL) criteria
- Approximately 39 soil samples were analysed for PFAS generally targeting locations near Cosgroves Creek, Badgerys Creek and adjacent to farm dams. PFAS were detected in approximately half of the soil samples analysed, concentrations were below the site assessment criteria for human health and ecological soil exposure for public open space and commercial /industrial land use.

The recommendations from this contamination assessment have been adopted within the environmental mitigation and management measures in Section 6.

Additionally, a Contamination Interface Report was undertaken in ten interface zones between the M12 Motorway Project and Sydney Metro Western Sydney Airport. The report provided combined contamination data relating to soil, groundwater and soil gas contamination at Badgerys Creek and Cosgroves Creek. However, this did not include interpretation of the contamination data.

4.3.2 Hazardous building material audits

WSP completed an HBM assessment (WSP, 2021) and compiled an HBM Register for selected properties located within the Project. These properties were located off The Northern Road and Luddenham Road in Luddenham and Elizabeth Drive in Badgerys Creek, NSW.

A number of HBM were identified including ACM, LBP, PCBs and SMF. A register containing details of HBM identified at each of the surveyed properties was also completed (refer to Appendix C of the Hazardous Building Material Survey – M12 Transport Links to Badgerys Creek (WSP, 2021)).

4.3.3 Landfill gas monitoring

The SUEZ Kemps Creek Resource Recovery Park (AEI10) carries out site activities around 60 metres south of the M12 West construction boundary. WSP site investigations did not indicate the presence of contaminants attributable to AEI10 within the Project boundary. Notwithstanding, the WSP Contamination Investigation Report recommends further assessment of potential migration of contamination from the SUEZ Waste Management Facility. Landfill gas monitoring undertaken by GHD for the facility is discussed in Section 4.2.2. See Section 6.1.4 for further soil gas investigations required.

4.3.4 Creek sediment contamination assessment

A sediment contamination assessment was completed by GHD in 2021. The results of this assessment are pertinent to all stages of the Project and are discussed in Section 4.2.4.

4.3.5 RAPs

A Draft Remedial Action Plan (RAP) was completed in August 2021 by WSP. The Draft RAP identifies three areas of concern based on the findings of the Contamination Investigation Report:

- Area 1: Located within the M12 WSIA interchange
- Area 2: Corresponds with the location of AEI 19 identified in the Environmental Assessment Documentation
- Area 3: Comprises numerous stockpiles located at a laydown yard at 1953-2109 Elizabeth Drive, Badgerys Creek

Table 4-2 provides an outline of the recommendations of the Draft RAP.

Table 4-2: Draft RAP recommendations

Area	Recommendation
Area 1	The preferred remedial approach to the removal of asbestos at Area 1 is the removal and offsite disposal of impacted material. Based on the existing investigation data it is likely that the bonded ACM contamination at Area 1 represents a small area which will be suitable for excavation and offsite disposal.
Area 2 and 3	A remedial approach for existing stockpiled soils is excavation and encapsulation with subsequent emu-picking across the former stockpile footprints.

The validation works described in the Draft RAP will allow for the effective implementation of the RAP in accordance with the remediation objectives. The M12 West Construction Contractor will be required to develop their own RAP, with consideration to the recommendations included in the Draft RAP prepared during detailed design.

Refer to Section 6.2 for further detail on preparation of RAP(s).

4.4 M12 East Detailed Design Progression

Detailed design is currently progressing for M12 East. Additional documentation related to contamination will be provided to the Construction Contractor once available for inclusion into the stage-specific CCLMP.

4.4.1 Creek sediment contamination assessment

A sediment contamination assessment was completed by GHD in 2021. The results of this assessment are pertinent to all stages and are discussed in Section 4.2.4.

5 Environmental aspects and impacts

5.1 Construction activities

Key aspects of the Project that could result in contaminated land disturbance and impacts include:

- Pre-construction activities including utility adjustment, site access provisions, property adjustments
- Clearing of vegetation
- Initial removal of topsoil
- General earthworks particularly during site establishment
- Building demolition
- Construction of site compounds and spoil / mulch and / or equipment stockpile areas
- Temporary access roads during construction
- Bulk earthworks
- Trenching, utilities and drainage works.

5.2 Impacts

The potential for contaminated land disturbance and impacts will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with known and potential contaminated land sources. Potential impacts attributable to construction might include:

- Inappropriate handling or disposal of contaminated or hazardous excavated materials
- Exposure of contaminated soils and/or groundwater to sensitive human receptors (construction personnel, Project team, or nearby communities)
- Mobilisation of surface and subsurface contaminants
- Migration of contaminants into the surrounding area via leaching, overland flow and/or subsurface flow
- Mobilisation of groundwater and/or surface water contamination
- Exposure of contaminants to sensitive ecological receptors (local water bodies, flora and fauna)
- Maintenance of onsite plant or unexpected release of potential contaminants
- Cross contamination within working areas
- Release of asbestos
- Release of odours from contaminated materials.

Relevant aspects and the potential for related impacts have been considered in an initial risk assessment which is found in Appendix A2 of the OCEMP. Section 6 of the CCLMP provide a suite of mitigation measures that will be implemented to avoid or minimise those impacts.

5.3 Cumulative impacts

The concurrent construction of various projects within the vicinity of the M12 Project gives rise to the potential for cumulative contamination impacts. Projects within the vicinity of the M12 Project include, but are not limited to:

- Western Sydney International Airport
- Sydney Metro – Western Sydney Airport
- The Northern Road upgrade
- Western Sydney Aerotropolis
- Other potential road projects such as Elizabeth Drive upgrade, Mamre Road upgrade and Outer Sydney Orbital
- Development land releases such as Southwest Growth Area and Western Sydney Employment Area.

It is noted that the scale of impact is dependent upon timing, location and type of construction activities. Although impacts are likely to be associated with soil erosion, soil management, salinity waterway contamination and spills, it is anticipated that these impacts will be short-term and minor as they will be limited to the construction phase and will be minimised through the implementation of management measures identified in Section 6.7.

Interagency communication between government departments undertaking work in the area is required to manage cumulative impacts with the aim of combining messages when possible and minimising impacts to the local community.

Consultation will be undertaken with neighbouring properties and with personnel who will be undertaking work on other projects within the vicinity of the M12 Motorway construction to ensure they are aware of any exclusion zones or sensitive areas identified for the Project.

6 Environmental mitigation and management measures

6.1 Further investigations

This section details further investigations required to be carried out by the Construction Contractor related to contaminated land.

6.1.1 Detailed Site Investigation

In accordance with NSW CoA E85, E86 and REMM SC05, prior to the commencement of any Work that would result in the disturbance of potential or contaminated soils, materials, groundwater or sediments, Detailed Site Investigations will be undertaken.

At a minimum, the Detailed Site Investigations will be conducted within AEIs identified in REMM SC05, to confirm the presence of contamination before the start of construction at these locations. Furthermore, the contamination assessment and investigations undertaken during detailed design will be reviewed by the Construction Contractor, who will then determine the requirement for any additional investigations to be undertaken.

The investigations will be carried out in accordance with the NSW EPA (1995) *Sampling Design Guidelines* and other NSW EPA endorsed guidance, including the NEPM (2013) guidelines to confirm the presence of contamination. Investigations will also be carried out in areas of additional cut around the airport interchange northern cut and airport interchange southern cut.

The Detailed Site Investigation Report(s) will include the following, in accordance with NSW CoA E86:

- Primary sources of contamination, for example potentially contaminating activities, infrastructure (such as underground storage tanks, fuel line, sumps or sewer lines) or site practices
- Contaminant dispersal in air, hazardous ground gases, surface water, groundwater, soil vapour, separate phase contaminants, sediments, infrastructure (e.g. concrete), biota, soil and dust
- Contaminant characterisation and behaviour (volatility, leachability, speciation, degradation products and physical and chemical conditions on-site which may affect how contaminants behave)
- Potential effects of contaminants on human health, including the health of occupants of built structures (for example arising from risks to service lines from hydrocarbons in groundwater, or risks to concrete from acid sulphate soils) and the environment
- Potential and actual contaminant migration routes including potential preferential pathways
- Adequacy and completeness of all information available for use in the assessment of risk and for making decisions on management requirements, including an assessment of uncertainty
- Review and update of the conceptual site model from the preliminary and detailed site investigations
- Nature and extent of any existing remediation (such as impervious surface cappings) and/or
- Whether the land is suitable (for the intended final land use) or can be made suitable through remediation.

The Detailed Site Investigation Report will be prepared in accordance with guidelines made or approved under section 105 of the CLM Act and/or reviewed and approved by consultants certified under either the

Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme.

6.1.2 Asbestos

In accordance with REMM SC06, further intrusive asbestos investigations throughout the construction footprint will be carried out prior to the commencement of construction by a qualified licensed asbestos assessor. The investigations are to include visual assessments and ground truthing along the length of the Project.

The Construction Contractors will maintain an Asbestos Register that documents all identified or potential asbestos-containing material in the Project area. The Asbestos Register will contain the following information:

- Identification of any potential or asbestos-containing material
- Location, type and condition of the asbestos-containing material
- Date when the asbestos was identified
- Labelling of the asbestos
- Maps, photographs or diagrams detailing the location of the asbestos within the Project area.

The Asbestos Register will be made available to the ESM (or delegate) on request for inclusion in Project Monthly Reports.

6.1.3 Salinity and acid sulphate soils

In accordance with REMM SC02, the Construction Contractor will undertake salinity and ASS sampling to confirm the presence of saline soils in areas of high salinity potential and to confirm the presence of ASS around creeks prior to disturbance.

If the investigations identify the presence of ASS it will be managed in accordance with the *Acid Sulphate Soil Manual* (ASSMAC, 1998). Should disposal of ASS be required, it will be done so in accordance with the *Waste Classification Guidelines: Part 4 Acid Sulfate Soils* (NSW EPA, 2014).

If the investigations identify the presence of saline soils, it will be managed in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook

Management measures relevant to salinity and ASS are presented in the CSWMP.

6.1.4 Soil gas contamination

In accordance with REMM SC10, detailed investigations were carried out within the area next to the SUEZ Kemps Creek Resource Recovery Park to assess the extent of high-risk soil gas (see Section 4.2.2).

These investigations were carried out in accordance (where applicable) with the *Guideline for the Assessment and Management of Sites Impacted by Hazardous Ground Gases* (NSW EPA 2012) and *Assessing Risks Posed by Hazardous Ground Gases to Buildings Report* (C665) (Wilson et al., 2007).

Section 4.2.2 outlines the results of the landfill gas monitoring already undertaken for the Project. Based on the conclusions of the landfill gas monitoring, ground gas monitoring during construction is recommended to be undertaken prior to the commencement of high-risk activities (i.e. work within excavations or confined spaces in locations where landfill gas exceedances have been previously identified).

The Work Health Safety Plan also identifies landfill gas monitoring due to the Occupational Health and Safety issue associated with the monitoring.

6.1.5 Land condition assessments

Prior to the use of land for locating site facilities, including areas for construction materials storage and stockpiling, a pre-construction land condition assessment will be prepared by the Construction Contractor and submitted to TfNSW. The assessment will be undertaken in accordance with TfNSW Environmental Procedure on *'Management of Wastes on Roads and Maritime Services Land'* (2014).

The purpose of the pre-construction land condition assessment will be to identify any existing waste or stored materials on the land prior to the area being occupied. Where Construction Contractor site facilities are no longer required, a post-construction land condition assessment will be prepared by the Construction Contractor and submitted to TfNSW. Any identified unauthorised waste attributable to the Construction Contractor activities will be rectified in accordance with the post-construction land condition assessment report and TfNSW QA Specification G36.

6.2 Remedial Action Plan, Interim Audit Advice and Site Audit Statement

If Detailed Site Investigations conclude that the specified land is unsuitable for the final intended use, a RAP will be prepared by a suitably qualified and experienced person. The Construction Contractor will use the Draft RAP for the subject land as a guide to prepare the RAP for remediation of that land. The RAP will be completed in accordance with all guidelines under the CLM Act 1997 and the relevant TfNSW Specifications.

Prior to commencing with remediation, the RAP and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor that certifies that the RAP is appropriate and that the site can be made suitable for the proposed use, will be submitted to the Planning Secretary for information.

The land to which any RAP applies will not be used for the Project until a Section A1 or Section A2 Site Audit Statement has been obtained that states that the land is suitable for the intended use. A copy of the Site Audit Statement and the associated Site Audit Report will be submitted to the Planning Secretary and the relevant Council for information no later than one month before the commencement of operation.

The Construction Contractor will maintain a register of contaminated sites for the Project and will update the register in response to the findings of any site contamination assessments. The register will also be used to track the ongoing management of the sites.

6.3 Asbestos containing material management

Areas of potential fill, stockpiles and historical uncontrolled earthworks and buildings/ structures containing asbestos previously demolished/ degraded have been identified as having moderate to high potential for containing asbestos (refer to Table 4-1). As detailed in Section 6.1.2 prior to the commencement of construction, further intrusive asbestos investigations will be carried out to assess asbestos risks.

An Asbestos Management Plan (AMP) is provided in Appendix D, in accordance with REMM SC04. The AMP will guide the excavation, handling, storage and disposal of asbestos identified during construction, including procedures for any unexpected asbestos. The AMP will be implemented in the event that potential ACM or actual asbestos is uncovered during construction of the Project. The AMP outlines requirements for the encapsulation of asbestos to be carried out in accordance with RAP(s).

6.4 Hazardous building materials

In accordance with REMM SC07, the Construction Contractor will develop a Hazardous Building Materials Management Plan before demolishing structures and/or buildings. The Plan will be prepared in accordance with relevant guidelines to manage the removal of known and unexpected hazardous building during demolition activities.

As discussed in Section 4.2.3, hazardous building material audits have been conducted. Buildings planned for demolition that do not have an audit completed, will need to be carried out in accordance with Australian Standard (AS 2601-2001): The demolition of structures. Where hazardous building materials are present, they will be managed to reduce the potential for contamination in accordance with the POEO Act and the *Protection of the Environment Operations (Waste) Regulation (2014)*.

6.5 Disposal of waste

Potential spoil disposal and reuse options were assessed in the Environmental Assessment Documentation. The selection of waste disposal and recovery facilities will be dependent on the nature and volume of waste streams generated and the capacity of the receiving facilities at the time of the waste generation.

All waste generated by the Project will be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes. Waste management will be completed in accordance with the CWRMP. Refer to the CWRMP on how to manage potential impacts related to the management and transport of spoil generated during construction of the Project.

For disposal of contaminated waste, this will be completed in accordance with the POEO Act and the Protection of the Environment Operations (Waste) Regulation 2014. It is noted that the contamination assessment undertaken by GHD (2021) also provided preliminary waste classification for specific areas within M12 Central. The Construction Contractor is to review this assessment to determine requirements for additional waste classification.

6.6 Areas of unexpected contamination

Where earthworks and ground disturbing activities are required, there is potential to expose unexpected forms of contamination within the surface and subsurface. In such instances, action is required to mitigate potential contaminated soil/material encountered during excavation or construction activities.

If potentially contaminated material is encountered, the Unexpected Contaminated Land Finds Procedure (Appendix C) will be followed. The Unexpected Contaminated Land Finds Procedure has been prepared in accordance with NSW CoA E89 and E90.

Works in the vicinity will be stopped or modified and will not recommence until the material has been analysed and management measures developed.

6.7 Environmental control measures

A range of environmental requirements and management measures are identified in the Environmental Assessment Documentation, and relevant TfNSW documents. Specific measures and requirements to address contamination impacts are outlined in Table 6-1.

Table 6-1: Contaminated land management and mitigation measures

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
Disturbance of contaminated or potentially contaminated land								
CL1	Prior to the commencement of any work that would result in the disturbance of potential or contaminated land and/or soil, a Detailed Site Investigation Report will be prepared by a suitably qualified Contaminated Site Specialist. The report will be prepared in accordance with the <i>CLM Act 1997, NSW EPA (1995) Sampling Design Guidelines</i> and NEPM (2013).	Pre-construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	NSW CoA E85 and E86 REMM SC05	Detailed Site Investigation Report
CL2	Testing will be carried out to confirm the presence of saline soils in areas of high salinity potential and to confirm the presence of ASS around creeks prior to disturbance.	Pre-construction Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	REMM SC02	Testing results
CL3	The Construction Contractor will notify TfNSW at least 24 hours prior to excavation of the contaminated material, and removal of any contaminated material from the site, and provide details of the proposed method and location of disposal.	Pre-construction Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	TfNSW QA Specification	Transmittal

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
CL4	Further intrusive asbestos investigations throughout the construction footprint will be carried out to assess asbestos risks before the start of construction. The investigations are to include visual assessments and ground truthing along the length of the project.	Pre-construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	REMM SC06	Asbestos Investigation Report
CL5	The AMP will be implemented throughout construction to guide the excavation, handling, storage and disposal of management of asbestos discovered during construction, including procedures for any unexpected asbestos	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	REMM SC04	This Plan Stage-specific CCLMP
CL6	A Hazardous Building Materials Management Plan will be prepared in accordance with relevant guidelines to manage the removal of known and unexpected hazardous building during demolition activities. Before demolishing structures and/or buildings, a hazardous building materials audit will need to be completed for structures/buildings that have not been demolished audited. The audit will be carried out in accordance with Australian Standard (AS 2601-2001) The demolition of structures will be supervised by appropriately qualified contamination specialist and avoid contamination of soil. A SafeWork NSW accredited asbestos assessor will ensure the	Pre-construction	Construction Contractor Construction Manager Contaminated Site Specialist SafeWork NSW Accredited Asbestos Assessor	✓	✓	✓	REMM SC07	Hazardous Building Materials Management Plan Hazardous Building Materials Audit

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	surface is cleared for asbestos containing material post-demolition. Where any other hazardous building materials are present, they will be managed to reduce the potential for contamination in accordance with the POEO Act and the <i>Protection of the Environment Operations (Waste) Regulation (2014)</i>.							
CL6a	If at any time suspect hazardous building materials are encountered that are not identified within the hazardous building materials audit, then works should immediately cease, the area made safe and advice sought from a suitably qualified person.	Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	GHD, 2021	Hazardous Building Materials Management Plan Hazardous Building Materials Audit
CL6b	If dead chickens or other biological waste is found during excavation, routine work health and safety practices will be adopted to protect workers and the material will be disposed of using existing disposal practices.	Construction	Construction Contractor Construction Manager Contaminated Site Specialist		✓		GHD, 2021	Site records
Remediation								
CL7	A Remedial Action Plan (RAP) will be prepared if remediation is required to make land suitable	Prior to remediation	Construction Contractor	✓	✓	✓	NSW CoA E87	RAP

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	for the final intended land use. The RAP will be endorsed in writing by a NSW EPA accredited Site Auditor. The RAP will be submitted to the Planning Secretary for information prior to commencing the remediation.		Construction Manager Contaminated Site Specialist					Validation Report
CL7a	Ongoing management and maintenance of the bonded ACM encapsulation will be undertaken in accordance with the LTEMP to provide surety of the asset into the operational phase of the project. The validation works described in this RAP will ensure the RAP is effectively implemented in accordance with the remediation objectives.	Construction	Construction Contractor Construction Manager Contaminated Site Specialist		✓		RAP (GHD, 2021)	RAP Validation Report
CL8	A Section A1 or Section A2 Site Audit Statement and the accompanying Site Audit Report, which state that the contaminated land disturbed by the works has been made suitable for the intended land use, will be submitted to the Planning Secretary and council after remediation and no later than one month before operation.	Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	NSW CoA E88	Section A Site Audit Statement and Site Audit Report
CL9	Contaminated land will not be used for the purpose approved under the terms of this approval until a Section A Site Audit Statement is obtained.	Post Remediation	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	NSW CoA E88	Section A Site Audit Statement and Site Audit Report

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
CL10	A Section B Site Audit statement will be prepared for the asbestos encapsulation and for sites where intrusive investigations confirm highly complex contamination issues.	Prior to construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓	✓	REMM SC09	Section B Site Audit Statement
CL10a	Air monitoring for respirable fibres will be conducted on each of the project area boundaries (i.e. areas with potential asbestos impact, stockpile site and placement site), to be defined at the commencement of site remediation works, for the duration of the works.	During remedial works	Construction Contractor Construction Manager Contaminated Site Specialist Licenced Asbestos Assessor	✓	✓	✓	RAP (GHD, 2021)	Section B Site Audit Statement
Soil gas contamination								
CL11	The outcomes of the detailed investigation will within the area next to the SUEZ Kemps Creek Resource Recovery Park to assess the extent of high-risk soil gas will be implemented including but not limited to ongoing ground gas monitoring from specifically designed and installed ground gas monitoring wells including investigations to understand the source(s) of the carbon dioxide.	Pre-Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓		REMM SC10	Report Work Health Safety Plan
CL12	Undertake risk assessments and safe work method statements to adequately consider and	Construction	Construction Contractor	✓	✓		REMM SC10	SWMS

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	address landfill gas. Potential actions may include: - Monitoring landfill gas during intrusive construction works in proximity of landfill sites / fill areas and intrusive maintenance works of operational phases - Prohibiting entry into excavations - Managing hot works with consideration of the potential presence of landfill gas.		Construction Manager Contaminated Site Specialist				GHD, 2021	Landfill gas monitoring results
CL13	If gas concentrations remain elevated near the project footprint, gas monitoring will be carried out during construction within the construction footprint next to the SUEZ Kemps Creek Resource Recovery Park. If excavations are to be carried out within enclosed structures, gas accumulation monitoring will be carried out before and during construction. On site gas monitoring will be carried out in accordance with the <i>NSW EPA (2016) Environmental Guidelines: Solid Waste Landfills</i>.	Construction	Construction Contractor Construction Manager Contaminated Site Specialist	✓	✓		REMM SC11	Monitoring results
Disposal of contaminated waste								
CL14	All wastes, including contaminated wastes will be identified and classified with the NSW EPA's <i>Waste Classification Guidelines</i> , with	Pre-construction	Construction Contractor	✓	✓	✓	NSW CoA E101 to 103	Waste Classification Reports

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
	appropriate records and disposal dockets retained for audit purposes. Disposal of contaminated waste will be completed in accordance with the POEO Act, <i>Protection of the Environment Operations (Waste) Regulation 2014</i> and the Construction Waste and Resource Management Sub-Plan. The Construction Contractor will review the investigation assessment undertaken by GHD (2021) for M12 Central to determine requirements for additional waste classification.	Construction	Construction Manager Construction Contractor ESR				REMM SC03	CWRMP
Unexpected discovery of contamination								
CL15	An Unexpected Contaminated Land Finds Procedure will be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during construction. The Unexpected Contaminated Land Finds Procedure will be implemented throughout the duration of work.	Pre-construction Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	NSW CoA E89 and 90 Appendix C Appendix D	Unexpected Contaminated Land Finds Procedure
CL16	The requirements for excavation of unexpected contaminants (as outlined in the Unexpected Contaminated Lands Procedure) will be carried out in consultation with the RAPs.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	SC03	Unexpected Contaminated Land Finds Procedure Consultation records

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
Use of contaminated material								
CL17	Surface material from TP303, TP304, TP310 and TP311 cannot be reused within landscaped areas or in areas within and/or adjacent to sensitive environmental receptors. Impacted material will require either appropriate off-site disposal or managed appropriately (i.e. buried, capped and managed) within the Project footprint.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	SC03	Waste classification reports
Odour								
CL18	Odorous materials from contaminated land will be excavated in a staged process. The exposed areas of odorous material will be kept to a minimum to reduce the total emissions from the site where feasible.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	AQ03	Site inspections
CL19	In the event that unexpected odours are encountered during construction, work in the area will cease, and the finds will be managed in accordance with the Unexpected Contaminated Lands Procedure.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	Best practice	Site inspections

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
CL20	Use of appropriate covering techniques may be implemented to control odour during remediation works: • Use of plastic sheeting to cover excavation faces or stockpiles • Use of fine mist sprays • Use of a hydrocarbon mitigating agent on the impacted areas/materials • Adequate maintenance of equipment and machinery to minimise exhaust emissions.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	RAP (GHD, 2021)	Site records
Groundwater and surface water								
CL21	To minimise the mobilisation of groundwater and surface water contamination, refer to the Blue Book guidelines (Landcom, 2004) and TfNSW Specifications.	Construction	Construction Contractor Construction Manager Construction Contractor ESR	✓	✓	✓	Blue Book guidelines (Landcom, 2004) TfNSW Specifications	Site inspections
Detailed Site Investigations								
CL22	The contamination assessment and investigations undertaken during detailed design will be reviewed by the Construction Contractor who will then determine the requirement for any additional investigations to be undertaken.	Construction	Construction Contractor Construction Manager	✓	✓	✓	Section 6.1	Detailed Site Investigation Report Site inspections

ID	Management measures	When to implement	Responsibility for implementation	Applicability			Reference or source	Evidence of implementation
				M12 West	M12 Central	M12 East		
			Construction Contractor ESR					

7 Compliance management

7.1 Roles and responsibilities

The Project's organisational structure and overall roles and responsibilities are outlined in Section 5.1 of the OCEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this CCLMP. Roles relevant to contamination management are described in Section 6 of this Plan.

7.1.1 Site Auditor

A NSW EPA accredited Site Auditor will be engaged as early in the assessment and remediation process as possible.

Prior to commencing with the remediation, the RAP and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor (that certifies that the RAP is appropriate and that the site can be made suitable for the proposed use) will be submitted to the Planning Secretary for information only. The NSW EPA accredited Site Auditor will endorse the RAP in writing. If there are any changes to the RAP, the changes will be endorsed in writing by the NSW EPA accredited Site Auditor.

7.1.2 Contaminated Site Specialist

A suitably qualified Contaminated Site Specialist will be responsible (along with the Construction Contractor) for the implementation of the environmental controls relating to contaminated land for the Project. The Contaminated Site Specialist will also be responsible for the preparation of the Detailed Site Investigation Report, as outlined in NSW CoA E85.

7.2 Training

To ensure that this CCLMP is implemented effectively, all site personnel (including sub-contractors) will undergo site induction training relating to contaminated land management issues prior to construction commencing. The induction training will address elements related to contaminated land management, including:

- Existence and requirements of this overarching CCLMP, the Construction Contractor's CCLMP and all plans and procedures prepared under the CCLMPs
- Relevant legislation, regulations and EPL requirements (where applicable)
- Environmental and occupational health and safety and workplace health and safety risks associated with contaminated materials
- Personal Protective Equipment (PPE) requirements
- Incident response, management and reporting
- Roles and responsibilities for contaminated land management
- Location of identified potential contaminated land sites
- Contamination management and protection measures
- Signs of contaminated soil
- Visual asbestos identification protocols

- Procedure to follow in the event of unexpected contaminated land findings during construction works (refer to Appendix C)
- Procedure to follow in the event of uncovering asbestos during construction works (refer to Appendix D).

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in contaminated land management or those undertaking an activity with a high risk of environmental impact. Site personnel will undergo refresher training at not less than six monthly intervals.

Daily pre-start meetings conducted by the Construction Contractor Foreman / Site Supervisor will inform the site workforce of any environmental issues relevant to contaminated land that could potentially be impacted by, or impact on, the day's activities.

Further details regarding staff induction and training are outlined in Section 5.3 of the OCEMP.

7.3 Monitoring and inspections

7.3.1 Monitoring

An overarching Construction Soil and Water Monitoring Program has been prepared in accordance with NSW CoA C11(b) and NSW CoA C11(c) and is provided in the CSWMP.

Monitoring for contamination will include, but not be limited to:

- Monitoring / testing of asbestos containing soil
- If required under the AMP (Appendix D), asbestos fibre monitoring and personal exposure asbestos fibre air monitoring for workers in accordance with *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC: 3003(2005)] (National Occupational Health and Safety Commission, 2005) and *How to Safely Remove Asbestos Code of Practice* (Safe Work Australia, 2011)
- Monitoring of gas during prior to and during high-risk construction activities, in accordance with REMM SC11 within the area next to the SUEZ Kemps Creek Resource Recovery Park as required by REMM SC10 (refer to Section 6.1.4)
- Sampling of excess soil material prior to removal of soil material from construction sites in accordance with the *Waste Classification Guidelines* (EPA, 2014)
- Sampling of material during and at the completion of demolition works, prior to commencement of construction at that site, in accordance with AS 2601 – 2001: The Demolition of Structures
- Prior to disturbance or removal of the topsoil in any area monitoring/inspection of topsoil removal activities.

Further details of monitoring requirements for the Project are presented in Section 7.2 of the OCEMP.

7.3.2 Inspections

Regular inspections of sensitive areas and activities with the potential to uncover or disturb contaminated land will occur for the duration of the Project. The Construction Contractor ESR will carry out weekly site inspections. TfNSW will also conduct independent inspections to confirm the Construction Contractors' compliance with contaminated land management requirements.

Weekly and other routine inspections by the ESM (or delegate), Environmental Review Group (ERG) representatives and the ER will occur throughout construction. Detail on the nature and frequency of these inspections are documented in Section 7.1 of the OCEMP.

Proposed inspections to be carried out by the Construction Contractors that are relevant to contaminated land are contained in Table 7-1.

Table 7-1: Contaminated land inspections

Inspection	Responsibility	Frequency
Contamination management inspections (where contamination is found)	Construction Contractor's ESR TfNSW Environment and Sustainability Manager (or delegate)	Weekly, as required
Inspection of managed bunded areas, erosion and sediment controls as part of the weekly environmental inspection	Construction Contractor's ESR TfNSW Environment and Sustainability Manager (or delegate) Construction Contractor Soil Conservationist TfNSW Soil Conservationist	Weekly
Assessment of suspected and potential contaminated sites	Construction Contractor Construction Manager Construction Contractor or TfNSW Contamination Specialist TfNSW Environment and Sustainability Manager (or delegate) / TfNSW Project Manager	As required

7.4 Incident planning and response

Response to incidents will be undertaken as described in Section 6.4 of the OCEMP and in accordance with the Environmental Incident Classification and Reporting Procedure (refer to Appendix A7 of the OCEMP).

7.5 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of contaminated land management measures, compliance with this CCLMP, and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 7.4 of the OCEMP.

7.6 Reporting and identified records

General reporting requirements and responsibilities are documented in Section 7.5 of the OCEMP. Reporting requirements relevant to contamination are summarised in Table 7-2.

Construction Contractors will be required to maintain accurate records substantiating all construction activities associated with the Project, including measures taken to implement this CCLMP.

Table 7-2: Reporting requirements relevant to contamination

Report	Frequency	Recipient	Responsibility	Reference
Site Contamination Report	Prior to the commencement of any work that would result in the disturbance of potential or contaminated land and/or soil	Planning Secretary (for information)	Suitably qualified and experienced person under the CLM Act	Section 6.1.1
Remedial Action Plan	If investigations conclude that the specified land is contaminated such that it is and will remain unsuitable for the Project	Planning Secretary (for information) EPA Accredited Site Auditor	Suitably qualified and experienced person under the CLM Act	Section 6.2
Section A1 or Section A2 Site Audit Statement and Site Audit Report	No later than one month before the commencement of Operation	Planning Secretary (for information) Relevant Councils	Suitably qualified and experienced person under the CLM Act	Section 6.2
Unexpected contaminated land finds register	Made available on request for inclusion in the Monthly Reports	TfNSW	Construction Contractor's ESR	Appendix C
Asbestos Register	Made available on request for inclusion in the Monthly Reports	TfNSW	Construction Contractor's ESR	Appendix D

In the event that suspected contamination is uncovered during construction of the Project, the following reporting will occur:

- In accordance with the Environmental Incident Classification and Reporting Procedure (Appendix A7 of the OCEMP), the unexpected discovery of contaminated land is classed as a 'Reportable Event', as such finds of this nature will be reported to TfNSW in accordance with the guidelines
- Where it is deemed that the contamination has been, or could have been caused or changed by, the operations of the Construction Contractor, the EPA will be notified in accordance with Section 60 of the CLM Act.

8 Review and improvement

8.1 Continuous improvement

Continuous improvement of this CCLMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of contaminated land management and performance of environmental controls
- Identify environmental risks not already included in the risk register
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

The Construction Contractors will be responsible for ensuring Project environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the Project, as part of the continuous improvement process.

The process for continuous identification and analysis of new risks associated with contamination that may arise during construction will be facilitated by:

- Construction Monitoring Programs
- Regular inspections of sensitive areas and activities and observations by site personnel (refer to Section 7.3.2)
- Revision of this Plan and the Construction Contractor's CCLMP and/or contamination management measures as required in response to community complaints or requests from regulatory agencies, the ER or the Planning Secretary.

This continuous risk analysis approach will ensure prompt identification of new risks and ensure efficient mitigation through implementation of appropriate management measures, as outlined in Section 6.

8.2 Update and amendment

The processes described in Section 7.7 of the OCEMP may result in the need to update or revise this CCLMP. This will occur as needed.

Any revisions to this CCLMP will be in accordance with the process outlined in Section 1.12 of the OCEMP.

Appendix A

Consultation Correspondence

M12 Motorway

March 2023

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1 Introduction

As detailed in Section 1.5 of the CCLMP, in accordance with NSW CoA C4(d), consultation has been undertaken with the following government agencies and stakeholders during the preparation of the CCLMP:

- Department of Planning, Industry and Environment (DPIE) Water¹ ((Natural Resources Access Regulator) NRAR)
- Water NSW
- Penrith City Council (PCC)
- Liverpool City Council (LCC)
- Fairfield City Council (FCC).

A log of the dates of engagement or attempted engagement with the parties identified above has been included in Section 1.5.1 of the CCLMP in accordance with NSW CoA A5(b). Section 2 details the evidence of engagement with each party and responses.

¹ Now Department of Planning and Environment (DPE) Water

2 Government Agency and Stakeholder Responses

This section provides consultation documentation undertaken during the consultation period with parties including:

- Engagement with parties identified in NSW CoA C4(d) that occurred prior to the submission of the CCLMP for approval by the Planning Secretary as required by NSW CoA A5(a)
- A copy of the responses provided during consultation with the required parties
- A summary of the issues raised during consultation and how they have been addressed as required by NSW CoA A5(d). A description of the outstanding issues raised during consultation and why they have not been addressed has also been included where required as per NSW CoA A5(e).

2.1 DPE Water (NRAR)

Section 2.1 details the engagement and response from DPE Water (NRAR) regarding the CCLMP prior to submission for approval and a summary of how the issues have been addressed.

Table 2-1: DPE Water (NRAR) comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
N/A	Thank you for giving the Natural Resources Access Regulator (NRAR) the opportunity to review M12 Motorway – Overarching Construction Contaminated Land Management Plan. NRAR has no comments.	No further comment required.	N/A

2.2 Water NSW

Section 2.2 details the engagement and response from Water NSW regarding the CCLMP prior to submission for approval and a summary of how the issues have been addressed.

Table 2-2 provides a summary of the issues raised during consultation and how they have been addressed as required by NSW CoA A5(d).

Table 2-2: Water NSW comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
N/A	It is recognised that it is unlikely that contamination will be found on WaterNSW land, as part of the M12 East Package. As such WaterNSW has no particular comment to make regarding contamination or mitigation measures as they relate to WaterNSW land, within the project footprint.	No further action required.	N/A
Appendix D	It is noted that in the plan no mention of notification is made to landholders, if contamination is found on their land (within the development footprint). It is WaterNSW's opinion that the document lacks adequate consultation measures when and if contaminants are identified. It is requested that landowners be notified if contamination is found on their land, and this be incorporated into the CCLMP. In particular, Appendix C (Unexpected Finds Procedure) of the CCLMP, only makes mention to notify TfNSW ESM and ER, then the EPA (if there is a risk of environmental harm). Further, section 2.2.11 of Appendix D (Asbestos Management Plan), does mention community notification for asbestos related works, but only to sensitive receivers and based on risk. As a landowner, WaterNSW would want to be notified if contamination was found on or near our land.	The Unexpected Contaminated Land Finds Procedure (Appendix C) Step 1 (Potential contaminated soil/material encountered during construction activities) has been amended to state: <i>TfNSW will notify landowners (e.g. Water NSW) where contamination is identified on their land</i> Section 2.1 (Unexpected Asbestos Finds Procedure) of The Asbestos Management Plan (Appendix D) has been amended to state: <i>TfNSW will notify landowners (e.g. Water NSW) where contamination is identified on their land</i>	Appendix D
CCLMP	As the Contamination CEMP has been separated from the Soils CEMP (CoA C4), WaterNSW requests to see and comment on the Construction Soil and Water Management Plan (CSWMP) when available.	TfNSW will provide the CSWMP Rev G to Water NSW for comment when this becomes available.	N/A

2.3 Penrith City Council

Section 2.3 details the engagement and response from PCC regarding the CCLMP prior to submission for approval and a summary of how the issues have been addressed. Table 2-3: PCC comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
N/A	No comments provided.	No further comment required.	N/A

2.4 Liverpool City Council

Section 2.4 details the engagement and response from LCC regarding the CCLMP prior to submission for approval and a summary of how the issues have been addressed.

Table 2-4: LCC comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
N/A	No comments were provided.	No further comment required.	N/A

2.5 Fairfield City Council

Section 2.5 details the engagement and response from FCC regarding the CCLMP prior to submission for approval and a summary of how the issues have been addressed.

Table 2-5 provides a summary of the issues raised during consultation and how they have been addressed as required by NSW CoA A5(d).

Table 2-5: FCC comments and TfNSW response

Section of comment	Comments	TfNSW Response	Section Amended
N/A	The CLMP provides sufficient information to manage land contamination during construction. No objections are raised subject to following the procedures outlined in section 6.7 and appendices of the report.	No further action required	N/A

Appendix B

Secondary CoAs and REMMs

M12 Motorway

March 2023



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CoA

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
E85	Prior to the commencement of any Work that would result in the disturbance of potential or contaminated soils, materials, groundwater or sediments, a Detailed Site Investigation Report(s) must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme. The Detailed Site Investigation Report(s) must be prepared in accordance with guidelines made or approved under section 105 of the Contaminated Land Management Act 1997. Note: Where Preliminary and Detailed Site Investigations have already been undertaken for contaminated soils, materials, groundwater or sediments they do not need to be undertaken again for the purposes of this condition.	✓	✓	✓	Section 6.1.1 Section 6.7 (CL1)
E86	The Detailed Site Investigation Report(s) must provide details on: (a) primary sources of contamination, for example potentially contaminating activities, infrastructure (such as underground storage tanks, fuel line, sumps or sewer lines) or site practices; (b) contaminant dispersal in air, hazardous ground gases, surface water, groundwater, soil vapour, separate phase contaminants, sediments, infrastructure (e.g. concrete), biota, soil and dust; (c) contaminant characterisation and behaviour (volatility, leachability, speciation, degradation products and physical and chemical conditions on-site which may affect how contaminants behave); (d) potential effects of contaminants on human health, including the health of occupants of builtstructures (for example arising from risks to service lines from hydrocarbons in groundwater, or risks to concrete from acid sulphate soils) and the environment; (e) potential and actual contaminant migration routes including potential preferential pathways;	✓	✓	✓	Section 6.1.1 Section 6.7 (CL1)

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	(f) the adequacy and completeness of all information available for use in the assessment of risk and for making decisions on management requirements, including an assessment of uncertainty; (g) the review and update of the conceptual site model from the preliminary and detailed site investigations; (h) nature and extent of any existing remediation (such as impervious surface cappings); and/or (i) whether the land is suitable (for the intended final land use) or can be made suitable through remediation.				
E87	Should remediation be required to make land suitable for the final intended land use, a Remediation Action Plan must be prepared. Prior to commencing with the remediation, the Proponent must submit to the Planning Secretary for information, the Remediation Action Plan and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor that certifies that the Remediation Action Plan is appropriate and that the site can be made suitable for the proposed use. The Remediation Action Plan must be implemented and any changes to the Remediation Action Plan must be endorsed in writing by the EPA-accredited Site Auditor. Note: It is strongly recommended that a site auditor is engaged as early in the assessment and remediation process as possible, as early communication between parties improves the efficiency of the audit.	✓	✓	✓	Section 6.2 Section 6.7 (CL7)
E88	A Section A1 or Section A2 Site Audit Statement (accompanied by an Environmental Management Plan) and the accompanying Site Audit Report, which states that the contaminated land disturbed by the works has been made suitable for the intended land use, must be submitted to the Planning Secretary and relevant council(s) for information after remediation and no later than one (1) month before the commencement of operation. Contaminated land must not be used for the purpose approved under the terms of this approval until a Section A1 or Section A2 Site Audit Statement is obtained which states that the land is suitable for that purpose and any conditions on the Section A1 or Section A2 Site Audit Statement have been complied with.	✓	✓	✓	Section 6.2 Section 6.7 (CL8 and CL9)

CoA No.	Condition Requirements	Applicability			Document Reference
		M12 West	M12 Central	M12 East	
	Nothing in the conditions prevents the Proponent from obtaining Section A Site Audit Statements for individual parcels of remediated land.				
E89	An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared before the commencement of Work and must be followed should unexpected contaminated land or asbestos (or suspected contaminated land or asbestos) be excavated or otherwise discovered during Work. The procedure must include details of who will be responsible for implementing the unexpected finds procedure and the roles and responsibilities of all parties involved.	✓	✓	✓	Section 6.6 Appendix C Appendix D
E90	The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout the duration of Work.	✓	✓	✓	Section 6.6 Appendix C Appendix D
E101	The importation of waste and the storage, treatment, processing, reprocessing or disposal of such waste must comply with the conditions of an EPL for the CSSI, or be done in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014, as the case may be.	✓	✓	✓	Section 6.5 CWRMP
E102	Waste must only be exported to a site licensed by the EPA for the storage, treatment, processing, reprocessing or disposal of the subject waste, or in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014, or to any other place that can lawfully accept such waste, except in accordance with Condition E15.	✓	✓	✓	Section 6.5 CWRMP
E103	All waste generated by Works must be classified in accordance with the EPA's Waste Classification Guidelines, with appropriate records and disposal dockets retained for audit purposes.	✓	✓	✓	Section 6.5 CWRMP

REMMs

Outcome	Reference #	Requirement	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
Salinity and acid sulfate soils	SC01	Construction within areas of moderate to high risk saline soils will be managed in accordance with the CSWMP. Specific measures will also include (but not be limited to): • Ongoing groundwater monitoring of salinity as part of the water quality monitoring program • Identification and management of saline discharge sites • Progressive stabilisation and revegetation of exposed areas following disturbance as soon as is practicable • Testing to confirm the presence of saline soils in areas of high salinity potential prior to disturbance • Soil salinity management will also be carried out in accordance with the NSW Department of Primary Industries (2014) Salinity Training Handbook	✓	✓	✓	Section 6.1.3 CSWMP
Salinity and acid sulfate soils	SC02	Testing will be carried out to confirm the presence of saline soils in areas of high salinity potential and to confirm the presence of ASS around creeks prior to disturbance	✓	✓	✓	Section 6.1.3 Section 6.7 (CL2) CSWMP
Impacts of soil and groundwater contamination	SC05	Detailed site (contamination) investigations will be carried out in accordance with the <i>NSW EPA (1995) Sampling Design Guidelines</i> and other NSW EPA endorsed guidance including the NEPM (2013) guidelines within the following AEI locations to confirm the presence of contamination before the start of construction at these locations: • AEI 17: Stockpiles within Hi-quality Quarry Group Head Office	✓	✓	✓	Section 6.1.1

Outcome	Reference #	Requirement	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
		- Within AEI 19: the area of miscellaneous construction activities and stockpiles of building materials along Luddenham Road (Lot 1, DP228498) - Within AEI 7: Area of waste and imported fill - Within AEI 21: Area of illegally dumped material along Range Road, Cecil Park - Within AEI 24: Stockpiles within the OzSource property - Within AEI 26: TreeServe (wood processing, stockpiles of woodchips, logs and fire wood) - Within the 'potential areas of existing fill' identified in the Soils and Contamination Assessment Report (Appendix K) of the Amendment Report.				
		Further soil investigations will be required in areas of the amended construction footprint located adjacent to the following AEIs to confirm the presence of contamination before the start of construction at these locations: - Within AEI 6: PGH Bricks and Pavers - Within AEI 9: Sydney Recycling Park/ Wanless Recycling and Former Kari & Ghossayn Pty Ltd (Solid Waste Landfill) - AEI 10: SUEZ Kemps Creek Resource Recovery Park.	✓	✓	✓	Section 4.2.1 Section 4.2.2 Soil investigations in these areas superseded by assessments undertaken during detailed design.
		Additional soil and groundwater investigations will be required in the areas of additional cut around the airport interchange northern cut and airport interchange southern cut to further assess the potential impacts to the amended project.	✓			Section 6.1.1

Outcome	Reference #	Requirement	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
		Depending on results of the investigations, or if remediation is deemed required at any site within the amended construction footprint, a Remedial Action Plan will be prepared before the construction.	✓			Section 6.2
	SC06	Further intrusive asbestos investigations throughout the construction footprint will be carried out to assess asbestos risks before the start of construction. The investigations are to include visual assessments and ground truthing along the length of the Project.	✓	✓	✓	Section 6.1.2
Impacts of soil and groundwater contamination	SC07	A Hazardous Building Materials Management Plan will be prepared in accordance with relevant guidelines to manage the removal of known and unexpected hazardous building during demolition activities. Before demolishing structures and/or buildings, a hazardous building materials audit will also be carried out in accordance with Australian Standard (AS 2601-2001) The demolition of structures. Where hazardous building materials are present, they will be managed to reduce the potential for contamination in accordance with the POEO Act and the Protection of the Environment Operations (Waste) Regulation (2014).	✓	✓	✓	Section 4.2.3 Section 6.4 Section 6.7 (CL6)
	SC08	All waste will be classified in accordance with the NSW EPA's Waste Classification Guidelines (2014), with appropriate records and disposal dockets retained for audit purposes.	✓	✓	✓	CWRMP
	SC09	A section B site audit statement will be prepared for the asbestos encapsulation and for sites where intrusive investigations confirm highly complex contamination issues.	✓	✓	✓	Section 6.2
Soil gas contamination	SC10	A detailed investigation will be carried out within the area next to the SUEZ Kemps Creek Resource Recovery Park to assess the extent of high-risk soil gas. A report will be prepared to document the outcomes		✓		Section 6.1.4

Outcome	Reference #	Requirement	Applicability			Document Reference
			M12 West	M12 Central	M12 East	
		of the investigation and outline measures to manage risks including nuisance odours to the surrounding area during excavation, and prevent the build-up of gases in buildings, basins, and sub-surface trenches and pits, and other enclosed spaces/depressions associated with the project during construction. These investigations will be carried out in accordance (where applicable) with the Guideline for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (NSW EPA 2012) and Assessing Risks Posed by Hazardous Ground Gases to Buildings Report (C665) (Wilson et al. 2007). This will include undertaking gas monitoring.				
	SC11	Should the further investigations determine that gas concentrations remain elevated near the project footprint, gas monitoring will be carried out during construction within the construction footprint next to the SUEZ Kemps Creek Resource Recovery Park. If excavations are to be carried out within enclosed structures, gas accumulation monitoring will be carried out before and during construction. On site gas monitoring will be carried out in accordance with the NSW EPA (2016) Environmental Guidelines: Solid Waste Landfills.		✓		Section 6.1.4
Odours during construction	AQ03	Odorous materials identified on site will be excavated in a staged process and exposed areas of odorous material will be kept to a minimum to reduce the total emissions from the site where feasible.	✓	✓	✓	Section 6.7 (CL18)

Appendix C

Unexpected Contaminated Land Finds Procedure

M12 Motorway

March 2023



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Document control

File Name	M12PPW-ADAP-ALL-EN-PLN-000015_J_S3_CCLMP_APP_C Appendix C – Unexpected Contaminated Land Finds Procedure
Title	M12 Motorway OCEMP Unexpected Contaminated Land Finds Procedure
Document Number (Teambinder)	M12PPW-ADAP-ALL-EN-PLN-000015

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
21/03/2023	21/03/2023
	

Revision history

Revision	Date	Description
A	09/09/2020	First draft for TfNSW review
B	01/10/2020	Response to TfNSW comments
C	21/10/2020	Response to TfNSW comments
D	27/07/2021	Updated with Final NSW and Commonwealth CoA
E	20/08/2021	Response to TfNSW and ER comments
F	10/09/2021	Response to TfNSW and ER comments
G	10/11/2021	Response to comments received during consultation
H	02/12/2022	Additional design changes updates
I	12/02/2023	Response to TfNSW comments
J	21/03/2023	Response to ER comments



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Glossary/Abbreviations

Abbreviation	Expanded Text
ASS	Acid sulfate soil
CCLMP	Construction Contaminated Land Management Sub-plan
CoA	Conditions of Approval
EIS	Environmental Impact Statement
EMS	Environmental management system
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental Assessment Documentation	The set of documents that comprise the Division 5.2 Approval: • Roads and Maritime Services (October, 2019) M12 Motorway, Environmental Impact Statement (EIS) • Transport for NSW (October, 2020) M12 Motorway, Submissions Report (the Submissions Report) • Transport for NSW (October, 2020) M12 Motorway, Amendment Report (AR) • Transport for NSW (December, 2020) M12 Motorway, Amendment Report submissions report (ARSR) • Transport for NSW (March, 2021) The M12 Motorway Amendment Report Submissions Report – Amendment (ARSR amendment) • WSP (October, 2021) M12 Motorway – West Package Detailed Design Consistency Assessment • GHD (October, 2021) M12 Motorway – Central Package Detailed Design Consistency Assessment • Arcadis (June, 2022) M12 Motorway – Sydney Water Crossings Consistency Assessment • Arcadis (July, 2022) M12 Motorway – Design Boundary Changes Consistency Assessment • Arcadis (August, 2022) M12 Motorway – Minor Change Consistency Assessment. The documents that comprise the EPBC referral: • Submission #3486 – The M12 Motorway Project between the M7 Motorway, Cecil Hills and The Northern Road, Luddenham, NSW Notification of referral decision and designated proponent - controlled action; date of decision 19 October 2018; ID: 2018-8286.
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.

Abbreviation	Expanded Text
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
ER	Environmental Representative
ESM	Transport for New South Wales Environment and Sustainability Manager
ESR	Construction Contractor Environmental Site Representatives
EWMS	Environmental Work Method Statements
km	Kilometres
OCEMP	Overarching Construction Environmental Management Plan
PASS	Potential acid sulfate soil
PPE	Personal protective equipment
Procedure, this	Unexpected Discovery of Contaminated Land Procedure
RAPs	Remedial Action Plans
SDS	Safety Data Sheet
SWMS	Safe Work Method Statements
TfNSW	Transport for New South Wales
WSIA	Western Sydney International Airport

1 Introduction

1.1 Purpose

This overarching Unexpected Contaminated Land Finds Procedure (this Procedure) details the actions to be taken when potential contaminated soil and/or material is encountered during excavation/construction activities. In the event that hazardous materials are discovered, this Procedure should be implemented.

This Procedure has been prepared in accordance with NSW Conditions of Approval (CoA) E89 and E90. This Procedure has been developed in accordance with best practice NSW Environment Protection Authority (EPA) contamination management guidelines and TfNSW specifications.

The Construction Contractors will prepare a stage-specific Unexpected Contaminated Land Finds Procedure as part of the Construction Contractors' Construction Contaminated Land Management Sub-plan (CCLMPs) in accordance with the legislation, guidelines and standards identified in Section 3 of this overarching CCLMP.

Where appropriate, the Construction Contractors may supply an Unexpected Contaminated Land Finds Procedure with an alternative structure provided it meets the requirements identified in this CCLMP and the relevant TfNSW specifications. TfNSW will review the Construction Contractors' documentation to confirm compliance with the applicable requirements.

1.2 Scope of the program

This Procedure is applicable to all activities conducted by site personnel (including sub-contractors) on the Project that have the potential to uncover/encounter contaminated soil/material. This procedure is not applicable to the identification of soils suspected to be contaminated with plant pathogens.

1.3 Induction and training

Where required, all site personnel (including sub-contractors) are to be inducted on the identification of potential contaminated soil/material along with the requirements of this Procedure during inductions and/or regular toolbox talks. Site personnel should be informed of the potential sources of contamination within the Project and indications of contamination in soil and groundwater, such as:

- Odour
- Discolouration/staining of soils
- Groundwater or surface water sheen
- Evidence of landfilling/discarded drums.

1.4 Roles and responsibilities

The Construction Contractor's Environmental Site Representative (ESR) will ensure that this Procedure is effectively implemented, and all site personnel are aware of the requirements of this Procedure.

The Construction Contractor's Superintendent will be responsible for ensuring that in the event that contaminated land is discovered, site personnel are informed immediately and all work in the vicinity of the find ceases. The Construction Contractor's Superintendent will be advised of any required actions for the control of discovered contamination on site, such as implementation of exclusion zones and signage, and will be responsible for ensuring the actions are undertaken.

The TfNSW Environment and Sustainability Manager (ESM) (or delegate) will liaise with the relevant authorities (such as EPA and a Contaminated Land Specialist) where required, and will approve the recommencement of works following any remediation undertaken.

1.5 Review

This Procedure will be updated by the Construction Contractors and reviewed by the Construction Contractors' Contamination Specialist (if required) and the TfNSW ESM (or delegate) prior to commencement of construction of the Project.

This Procedure will be updated throughout construction of the Project to include any new identified sites of contamination, if required, and subsequent additional management measures. This Procedure will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of the CCLMP.

2 Procedure

The steps to be followed in the event that contaminated material is encountered during construction are outlined below. Indicators of contamination in soils include:

- Discolouration of the soil, including staining and horizontal layers of discolouration
- Odours from soil
- Oily sheen on water leaving soils.

Step 1. Potential contaminated soil/material encountered during construction activities

If potential contaminated soil/material is encountered during excavation/construction activities:

- **Cease work** in the immediate/affected area
- The Construction Contractor Foreman/ Site Supervisor will immediately notify the TfNSW ESM (or delegate) and the Environmental Representative (ER). TfNSW will notify landowners (e.g. Water NSW) where contamination is identified on their land
- Install environmental controls around the site to contain the contaminated material, including diversion of water to minimise potential spread via surface water runoff
- If it is determined that there is a risk of environmental harm from the potential contamination, the EPA will be notified immediately in accordance with the TfNSW Environmental Incident and Classification Procedure (refer to Appendix A7 of the OCEMP)
- If it is determined that the contaminated soil/material may contain asbestos containing material, refer to the Asbestos Management Plan (Appendix D of the CCLMP)
- Recommence works in an alternate area where practicable.

Step 2. Environmental management and work health safety management

Prior to any contamination investigation, management or remediation activities, appropriate Safe Work Method Statements (SWMS) and Environmental Work Method Statements (EWMS) will be prepared by the Construction Contractor's ESR and reviewed by the TfNSW Project Manager and TfNSW ESM (or delegate).

Personal protective equipment (PPE) will be worn as per the relevant Safety Data Sheet/s (SDS) (where the SDS are available). This may include, but not be limited, to:

- Protective eye-wear (if not wearing a full face mask)
- Face mask
- Steel – capped rubber-soled work shoes or gumboots with no laces or disposable overshoes that have an anti-slip sole for placement over work shoes
- Single use disposable nitrile or latex gloves
- Disposable asbestos coveralls rated type 5, category 3
- Work clothes (i.e. long sleeve shirt/pants and steel capped boots).

Step 3. Undertake Detailed Site Investigation

The TfNSW ESM (or delegate) will assess the situation and if considered necessary, commission a suitably qualified contamination specialist to undertake a contamination investigation in the area of the find.

The material will be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014).

If necessary, the TfNSW ESM (or delegate) will liaise with the relevant authorities to determine the appropriate management options. The TfNSW ESM (or delegate) (in consultation with specialists) will determine the appropriate management measures to be implemented. This may include leaving contamination undisturbed, capping of contamination, treatment or off-site disposal. Material to be disposed of off-site will be transferred to an appropriately licensed waste facility, as outlined in the CWEMP (refer to Appendix B7 of the OCEMP).

If the material is determined to be acid sulfate soil (ASS) or potential acid sulfate soil (PASS), refer to the Construction Soil and Water Management Plan for management procedures relating to ASS or PASS.

Step 4. Remedial action

If the Detailed Site Investigations conclude that the specified land is unsuitable for the final intended use, a RAP will be prepared by a suitably qualified and experienced person. TfNSW have prepared Draft RAPs for M12 West and M12 Central. The Draft RAP for the subject land will be used as a guide to prepare the RAP for remediation of that land. The RAP will be completed in accordance with all guidelines under the CLM Act 1997.

Prior to commencing with the remediation, the RAP and an Interim Audit Advice or a Section B Site Audit Statement from a NSW EPA accredited Site Auditor that certifies that the RAP is appropriate and that the site can be made suitable for the proposed use, will be submitted to the Planning Secretary for information only.

Remedial actions will be incorporated into specific Remedial Action Plans (RAPs). RAPs will be prepared by a suitably qualified and experienced person and in accordance with all guidelines under the *Contaminated Land Management Act 1997*. Where available, the Principals Draft RAP for the subject land will be used as a guide to prepare the RAP for remediation of that land.

Relevant EWMS or SWMS will be reviewed and updated when required.

Step 5. Recommence works

Recommence works once remedial works have been implemented and sampling has validated that the remediation strategy has been successful. Following implementation of the RAP, the Construction Contractor will submit a Section A1 or Section A2 Site Audit Statement and the accompanying Site Audit Report from the NSW EPA accredited site auditor, which states that the contaminated land disturbed by the works has been made suitable for the intended land use, to TfNSW, the Planning Secretary and relevant councils in accordance with NSW CoA E88 no later than one month before the commencement of operations. The TfNSW ESM (or delegate) will grant approval for the Construction Contractor to recommence works upon reviewing the documentation provided.

3 Records

The Construction Contractors will maintain a register of any unexpected contamination finds, including a map of all contaminated and/or remediated sites. The register will be made available to the TfNSW ESM (or delegate) on request for inclusion in Project Monthly Reports.

Appendix D

Asbestos Management Plan

M12 Motorway

March 2023

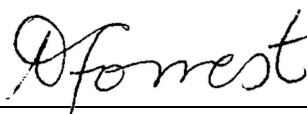


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Document control

File Name	M12PPW-ADAP-ALL-EN-PLN-000015_J_S3_CCLMP_App_D Appendix D – Asbestos Management Plan
Title	M12 Motorway OCEMP Asbestos Management Plan
Document Number (Teambinder)	M12PPW-ADAP-ALL-EN-PLN-000015

Approval and authorisation

Plan reviewed by:	Plan reviewed by:
Suzette Graham TfNSW Environment and Sustainability Manager	Deanne Forrest TfNSW Project Director – M12
21/03/2023	21/03/2023
	

Revision history

Revision	Date	Description
A	09/09/2020	First draft for TfNSW review
B	01/10/2020	Response to TfNSW comments
C	21/10/2020	Response to TfNSW comments
D	27/07/2021	Updated with Final NSW and Commonwealth CoA
E	20/08/2021	Response to TfNSW and ER comments
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Glossary/Abbreviations

Abbreviation	Expanded Text
ABN	Australian business number
ACM	Asbestos containing material
AMP	Asbestos Management Plan
ARCO	Asbestos Removal Control Plan
ARCP	Asbestos Removal Control Plan
CCLMP	Construction Contaminated Land Management Sub-plan
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EMS	Environmental management system
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
ER	Environmental Representative
ESM	Transport for New South Wales Environment and Sustainability Manager
ESR	Construction Contractor Environmental Site Representatives
EWMS	Environmental Work Method Statements
km	Kilometres
LAA	Licensed asbestos assessor
LTEMP	Long-Term Environmental Management Plan
OCEMP	Overarching Construction Environmental Management Plan
PPE	Personal protective equipment
Procedure, this	Unexpected Discovery of Contaminated Land Procedure
QA	Quality assurance
RAPs	Remedial Action Plans
REMM	Revised Environmental Management Measure



Abbreviation	Expanded Text
SWMS	Safe Work Method Statements
TfNSW	Transport for New South Wales
WSIA	Western Sydney International Airport

1 Introduction

1.1 Purpose

This Asbestos Management Plan (AMP) has been prepared to document the procedure to be undertaken in the event that potential asbestos containing material (ACM) or actual asbestos is uncovered during construction of the Project, in accordance with Revised Environmental Management Measure (REMM) SC04. Implementation of this Plan will ensure that asbestos is managed in such a way as to avoid harm to site personnel, visitors and the community.

Asbestos / ACM fragments that are remnant from previous activities may be scattered throughout the Project area or present in existing stockpiled material. Asbestos-contaminated ground may be encountered when undertaking excavation for roadworks and/ or property adjustments at unknown locations. It may also be encountered during demolition works or removal of structures. Disturbance of ground and/or pits associated with utilities creates the potential for exposure to airborne asbestos fibres.

This Plan has been developed in accordance with relevant legislation, NSW Environment Protection Authority (EPA) endorsed guidelines (including the waste guidelines), industry codes of practice, TfNSW draft *Asbestos in Soils Management Procedure* (TfNSW, 2020) and TfNSW Quality Assurance (QA) Specifications.

1.2 Scope

Work involving, or likely to involve the disturbance of asbestos is considered a high risk construction activity. Implementation of this AMP does not replace the need for the Construction Contractors to prepare Environmental Work Method Statements (EWMS) and Safe Work Method Statements (SWMS) for the management of materials containing asbestos.

EWMS will be prepared by the Construction Contractor's Environmental Site Representative (ESR) and reviewed by the TfNSW Project Manager, TfNSW ESM (or delegate) and Environmental Representative (ER) before commencement of the construction activities to which they apply.

SWMS will be prepared by the Construction Contractor and reviewed by the TfNSW Project Manager and TfNSW ESM (or delegate) before commencement of the construction activities to which they apply.

1.3 Objectives

The key objectives of this Plan are to:

- Provide the procedure for assessment of asbestos / ACM in the Project area
- Maintain accurate records of the location of asbestos in an Asbestos Register
- Avoid or minimise asbestos-related risks by implementing environmental control measures
- Ensure control measures are effectively implemented
- Ensure asbestos removal is performed by a licensed asbestos removalist under the direction / recommendation of an accredited occupational hygienist.

1.4 Induction and training

All site personnel (including sub-contractors) will undertake an induction to ensure that they understand the types and location of ACM / potential ACM on site and control measures and safe work methods before they commence work. Site personnel will be adequately trained to recognise the health risks of asbestos, use of the Asbestos Register, processes and safe work procedures to be followed to prevent exposure and correct use of personal protective equipment (PPE).

Prior to commencement of each shift, or change in shift, the Construction Contractor Foreman / Site Supervisor will inform all site personnel of any planned asbestos removal work on site.

A copy of this Plan will be kept at the construction work site where the work is being carried out.

1.5 Roles and responsibilities

All site personnel are responsible for ensuring they are familiar with the Asbestos Register and the locations where asbestos / ACM is identified. Any suspected asbestos / ACM finds will be reported to the Construction Contractor Foreman and/or Site Supervisor and the Construction Contractor ESR.

Removal of asbestos must be undertaken by the holder of a Class A or Class B Asbestos Removal Licence issued by SafeWork NSW, as required.

1.6 Review

This Plan will be updated by the Construction Contractor, in consultation with the Construction Contractor's ESR, and reviewed by the TfNSW Senior Environment Officer (or delegate) prior to commencement of construction of the Project.

This Plan will be updated throughout construction of the Project to document the location of any asbestos / ACM discovered on site and any changes to construction methodologies and subsequent additional management measures. This Plan will be reviewed annually, or as required in accordance with the continuous improvement process described in Section 8 of the Construction Contaminated Land Management Sub-plan (CCLMP).

2 Procedure

2.1 Unexpected asbestos finds procedure

In the event that a person on site identifies or disturbs asbestos / ACM that is not already identified in the Asbestos Register, the Construction Contractor will follow all reporting and notification requirements in OCEMP Appendix A7 TfNSW Environmental Incident Classification and Reporting Procedure, including notifying the ER.

Asbestos management for both friable and non-friable asbestos, will be undertaken as follows:

Step 1 – Cease works in the area potentially impacted by ACM as soon as it is safe to do so and move to the upwind side of the area, or away from the area.

Step 2 – Assess the potential immediate risk to human health posed by the unexpected find and move away from the area if required.

Step 3 – Delineate an exclusion zone around the affected area using fencing and/or appropriate barriers and signage. Keep soil/ACM damp to minimise / prevent the release of fibres to air.

Step 4 – Notify the Construction Contractor's ESR and TfNSW ESM to assess the unexpected find and determine what further assessment and/or remediation works are required. Implement the incident reporting procedure. TfNSW will notify landowners (e.g. Water NSW) where contamination is identified on their land.

Step 5 – Construction Contractor's ESR in consultation with an Environmental Consultant to implement RAP.

Step 6 – NSW EPA accredited auditor to confirm remedial actions have been successful and confirm works may proceed.

2.2 Asbestos removal

Asbestos removal will be undertaken by suitably qualified personnel and/ or subcontractors who are licensed by SafeWork NSW.

2.2.1 Asbestos Removal Control Plan (ARCP)

An Asbestos Removal Control Plan (ARCP) is required to be completed in accordance with *Work Health and Safety Regulation 2017* (Regulation 464). The ARCP will be developed prior to undertaking any asbestos removal works. The aim of the plan is to outline the specific methods and processes that will be used to ensure the removal is safe and effective.

Additionally, Safe Works Method Statements (SWMS) will also be generated for individual ACM related activities.

2.2.2 Identification

Friable Asbestos

- Requires Class A License

- Any amount of friable asbestos, ACM, asbestos contaminated dust or debris (ACD) or non-friable asbestos.

Licensed Non-friable asbestos

- Requires class B license
- Greater than 10 metres squared of Non-Friable (bonded) asbestos or ACM
- ACD that is associated with removal to 10 square metres or more of non-friable asbestos or ACM.

Unlicensed Asbestos

- No license required
- 10 meters squared or less of Non-Friable (bonded) asbestos or ACM
- ACD that is not more than a minor contamination and is associated with the removal of 10 square meters or less of non-friable asbestos or ACM.

Asbestos Removal from soil

- May require Class A or Class B license depending on type (Friable or Non-Friable)
Asbestos-contaminated soil comprising non-attached pieces of asbestos cement products and other material containing asbestos uncovered in soil.

2.2.3 Notification

Prior to the commencement of licensed asbestos removal works, notification to SafeWork NSW is required. SafeWork NSW requires a minimum of five days' notice prior to the removal of asbestos and the notification will include:

- Name, registered business name, Australian business number (ABN), license number and business contact details of the licensed asbestos removalist
- Name and business contact details of the Supervisor who will oversee the removal work
- Client name and contact details
- Name, including registered business or corporate name, of the person with management or control of the workplace
- Workplace address, including specific location if a large workplace
- Kind of workplace where removal work will be performed (workplace type and scope of work)
- Date of notification
- Start date of the removal work and an estimation of how long it will take
- Nature of asbestos to be removed – friable or non-friable
- Type of asbestos, e.g. asbestos-contaminated sheeting, vinyl tiles, lagging, gaskets, etc.
- For friable asbestos (not restricted to soils) the mechanism by which the area will be enclosed
- Estimated quantity of asbestos to be removed
- Number of workers who will perform the removal work and details of their competency to carry out the removal work.

2.2.4 Site Establishment and Signage

The boundaries of the 'Asbestos Works Area' and the 'Asbestos Removal Site' will be determined and defined by the nominated asbestos removal supervisor. All stakeholders will agree on the asbestos removal boundaries before any asbestos removal work commences. In determining the asbestos removal boundaries, consideration shall be given to:

- The use and suitability of various types of enclosures and asbestos removal methods; and
- The impacts of the asbestos removal work, including potential exposures in the surrounding region. In determining the distance between barriers and the asbestos work area a risk assessment should take account of:
 - Whether the ACM are friable or non-friable
 - Activity around the asbestos work area (other workers, visitors, neighbours, the public, etc.)
 - The methods of ACM removal
 - Any existing barriers (walls, doors, etc.)
 - The quantity of ACM to be removed
 - The type of barrier used (e.g. boarding or tape).

Protective barricades will be installed to delineate the asbestos related area/s and restrict unauthorised persons from entering the asbestos removal work. The asbestos removal site boundary will be clearly and securely delineated to ensure persons do not enter inadvertently or without authority. Signage may also be installed along construction boundaries of sites adjoining the community. Signage will warn persons that asbestos removal work is being carried out, of the dangers of exposure to asbestos and of PPE and other site entry requirements. Stockpiles will also be covered and labelled.

All boundary delineation and warning/danger signs will remain in place until a clearance to re-occupy has been granted. All warning/danger signage will comply with *AS 1319 Safety signs for the occupational environment*. These signs will be weatherproof, constructed of light-weight material and adequately secured.

Signage and barricades will stay in place until all licensed asbestos removal work is complete and a clearance certificate is provided.

In circumstances where the erection of fencing or barricades is not feasible, such as on concrete hard stand or within a building, tape may be used as a barrier to define an asbestos work area (for some types of asbestos removal work of short duration). If a sign is not feasible, tape with the words 'asbestos hazard' repeated along its length may be used instead to delineate and communicate the hazard.

2.2.5 Removal Methods

The asbestos removalist will use techniques to eliminate or minimise the generation of asbestos fibres so far as reasonably practicable. They will choose the method of asbestos removal that is most effective at minimising fibre release at the source. The removal methods are listed in preferred order:

- Wet spray method – asbestos fibres are significantly suppressed; however, they are not entirely eliminated so the use of respiratory protective equipment is essential

- Saturation and water injection method – used during friable removal
- Dry method - can only be used if the wet spray method is not suitable, for example if there are live electrical conductors or if equipment could be permanently damaged or made dangerous by contact with water.

The following table outlines the typical removal techniques that may be used to remove ACM in soils.

Table 1: Removal techniques, applications and limitations

Removal Technique	Applicability and Limitations
Hand Picking	• Suitable for bonded ACM in near surface soils only (i.e. <10 cm) • Raking may enhance removal, although only in sandy soils • Not applicable for friable asbestos • Less effective in areas of dense vegetation
Tilling	• Mechanical tilling to turn over soil followed by hand picking • Suitable for bonded ACM in soils to approx. 30 cm in sandy soils • Not applicable for friable asbestos • Less effective in areas of dense vegetation, or clayey soils
Mechanical Screening	• Suitable for large volumes of soil impacted by Bonded ACM • Susceptible to generate fibres requiring effective dust/fibre control • Not applicable for friable asbestos
Mechanical Excavation	• Physical excavation of soil containing ACM where impact extends beneath surface soils • Generates larger volume of soil that requires further management (i.e. off-site disposal, screening, spreading and handpicking/tilling)

2.2.6 Air Monitoring

All air monitoring will be conducted by licensed asbestos assessor (LAA) in accordance with the requirements outlined. The location and layout of the air monitors will be detailed within the ARCP. Air monitoring requirements will vary depending on the type of asbestos being removed, the location and position of the asbestos. The following rules should be applied when determine if air monitoring is required (extract from *Safe Work Australia – Code of Practice on How to Safely Remove Asbestos* (2016):

- For friable asbestos removal – Air monitoring is mandatory for all friable asbestos removal. This includes prior to dismantling an enclosure and for the purposes of the clearance inspection.
- For more than 10 m² of non-friable asbestos removal – Air monitoring is not required but may be considered to be carried out by an independent licensed asbestos assessor or competent person to ensure compliance with the duty to eliminate or minimize exposure to airborne asbestos and to ensure the exposure standard is not exceeded
- Public Location – Air monitoring should be considered where the asbestos removal work is being undertaken in or next to a public location

- Exposure air monitoring – Air monitoring should be carried out at other times to determine a worker's exposure to airborne asbestos if, based on reasonable grounds, there is uncertainty as to whether the exposure standard may be exceeded and a risk assessment by a competent person indicates it is necessary. Since most uses of asbestos are prohibited, exposure monitoring should not be required frequently.

Air monitoring may be required when:

- It is not clear whether new or existing control measures are effective
- There is evidence (for example, dust deposits are outside the enclosure) the control measures have deteriorated as a result of poor maintenance
- Modifications or changes in safe work methods have occurred that may adversely affect worker exposure
- There has been an uncontrolled disturbance of asbestos at the workplace.

Air monitoring of the asbestos work area will be carried out by the Construction Contractor in conjunction with the LAA. Monitors will be placed at several locations by the LAA, prior to the commencement of asbestos work. The results of air monitoring will be made available as soon as possible to all workers on site. The asbestos supervisor will be notified immediately if the fibre count exceeds the recommended level, as set out in Table 2.

Table 2: Exposure standards for asbestos as set out in the National Code of Practice: How to Safely Remove Asbestos

Action level (fibre/mL)	Control/action
Less than 0.01	Continue with current control measures
Greater than and equal to 0.01 and less than or equal to 0.02	Review control measures; investigate the cause and implement controls to eliminate or minimise exposure and prevent further release.
Greater than 0.02	Stop removal work, notify the regulator together with air monitoring results by phone followed by fax or written statement. Investigate the cause by conducting a visual inspection of enclosure (if used) and associated equipment in consultation with all workers involved. Implement controls to eliminate or minimise exposure and prevent further release by extending the isolated/barricaded area around the removal area/enclosure as far as reasonably practicable until fibre levels are at or below 0.01 fibres/ml. Wet wipe and vacuum surrounding area and seal any identified leaks. Smoke test the enclosure until it is satisfactorily sealed. Recommence work once further air monitoring confirms fibre levels are at or below 0.01 fibres/ml.

2.2.7 Clearance

Following removal of asbestos / ACM, the licensed asbestos removalist will arrange for a clearance inspection of the area to facilitate the issue of a clearance certificate and allow construction to recommence in the affected area. The clearance inspection is conducted by:

- An independent licensed asbestos assessor, for work that was carried out by a Class A licensed asbestos removalist
- An independent competent person, for asbestos work that is not required to be carried out by a Class A licensed asbestos removalist.

To be independent, the licensed asbestos assessor must not be involved in the removal of asbestos for that specific job and is not involved in a business or undertaking involved in the removal of the asbestos for that specific job.

A clearance certificate will be issued if the independent licensed asbestos assessor or competent person is satisfied that the asbestos removal area and the immediate area are free from visible asbestos contamination. Entry to the area will be permitted following confirmation of certification

2.2.8 Decontamination

Decontamination applies to all workers exiting the asbestos work area, all plant, equipment and tools used in the asbestos work area (at the completion of the asbestos work or at their earlier removal from the area) and, at the completion of the asbestos removal work, the asbestos work area itself.

The methods used for decontamination are based on the *Code of Practice How to Safely Remove Asbestos 2016*.

Decontamination of personnel

Personal decontamination will be undertaken each time workers leave the asbestos work area except in extreme emergencies. Personal decontamination shall be done within the asbestos work area in a location where re-contamination cannot occur. This area should be at the entry/exit interface of the site so that workers have to pass through.

Asbestos-contaminated PPE must not be transported outside the asbestos work area except for disposal purposes, after being appropriately decontaminated.

Respiratory protective equipment must be used until all contaminated disposable coveralls and clothing has been vacuum cleaned and/or removed and bagged for disposal, and personal washing has been completed.

Any PPE used while carrying out asbestos work must not be taken home.

Personal hygiene and careful washing are essential. Particular attention shall be paid to the hands, fingernails, face and head.

All contaminated materials, including cleaning rags, plastic sheeting and PPE etc., must be disposed of as asbestos waste.

Decontamination of re-useable PPE

PPE that is to be re-used for asbestos removal work, e.g. boots, helmets, non-disposable respirators, must be fully dismantled and cleaned in a suitable asbestos work area and placed in sealed containers that are labelled 'For asbestos removal work only'. Before removal from the asbestos work area the containers must be decontaminated by vacuuming and/or wiping down with wet cloths. This retained PPE must only be used for asbestos removal work.

Decontamination of plant, equipment and tools

Plant, equipment and tools that are engaged to work within asbestos work areas must be clearly identified during the procurement stage. Providers of plant and equipment to be used in the asbestos work area are to be advised in writing that the plant is required to work within this area. Plant requirements in regard to the operator's cabin air conditioning and air pressurising system filters and other internal combustion engine air filters must be communicated in writing with clear procedures documented on maintenance and decontamination.

After the asbestos removal work is complete, plant equipment and tools must be decontaminated. Any warning tag fitted to plant in respect to the decontamination of air filters must be removed after the contaminated filters have been removed and replaced with new filters for use outside of the asbestos work area.

At the end of the asbestos removal work, all tools should be:

- Decontaminated (i.e. fully dismantled and cleaned) in a suitable asbestos work area; and
- Placed in sealed containers that are labelled 'For asbestos removal work only' (and used only for asbestos removal work); or
- Disposed of as asbestos waste.

The Construction Contractor will outline procedures for the decontamination of plant and equipment in their stage-specific AMP identifying processes that will be implemented onsite. These procedures may include details for the capture and disposal of water should the hosing down of equipment be required and measures to decontaminate tracks and wheels to minimise the potential of cross contamination.

2.2.9 Waste Disposal

Asbestos waste will be disposed of as soon as reasonably practicable. Temporary storage of minor amounts of ACM in a designated bin may be required before disposal can occur. Asbestos waste will be disposed at a waste disposal site in accordance with NSW EPA guidelines (including *Waste Classification Guidelines* (EPA, 2014)) and relevant industry codes of practice. Disposal of ACM will be to an approved asbestos waste facility listed on the NSW EPA website (<http://www.epa.nsw.gov.au/waste/asbestos/>).

The Construction Contractors will notify the TfNSW Environment and Sustainability Manager (or delegate) and TfNSW Project Manager at least 24 hours prior to removal of ACM from site and will provide details of the proposed method and location of disposal.

All ACM materials disposed offsite will be recorded on the Construction Contractor's waste tracking form(s) and documented within the project waste management register. Additionally, asbestos weighing more than 100 kilograms or consisting of more than 10 square metres of asbestos sheeting in one load will be tracked using the NSW EPA Waste locate system.

Asbestos waste transported by trucks

The transportation of asbestos waste by trucks must comply with the following requirements:

- Transporter must have the appropriate EPA license to transport asbestos waste
- Asbestos contaminated soils are wetted down

- Any part of any vehicle in which a person transports asbestos waste is covered, and leak proof during transportation
- Bonded asbestos materials must be securely packaged during transportation
- Friable material is kept in a sealed container during transportation.

2.2.10 Encapsulation

Encapsulation means that ACM is encapsulated under the pavement (kerb to kerb) on the project site.

Encapsulation involves the placement of impermeable barriers below, around and covering the ACM impacted material to isolate it from being a potential pathway of exposure. This barrier is typically comprised of non-woven geotextile and is used to separate ACM-impacted material from the clean materials used to construct the covering layer. Geotextile materials should be of a high visibility colour to provide a warning of underlying ACM contamination. The geotextile selected may also need other properties, depending on its application (e.g. increased tensile strength, permeability, chemically inert etc.).

Encapsulation of ACM minimises the need to dispose of the material off site. Encapsulation of ACM on site will be determined by the Construction Contractor Geotechnical Engineer and Construction Contractor's ESR.

Construction of any encapsulation will be completed under a Remedial Action Plan (RAP) prepared by a certified Contaminated Land Specialist. Completion of the remediation work and validation of the work is required to be in accordance with the RAP.

Validation will include, but not limited to:

- Survey of the encapsulation
- Photos to show geofabric layers
- Validation of the thickness and quality of covering layer(s).

The location and method of ACM encapsulation on the Project will:

- Consider the nature of material with ACM e.g. topsoil, general fill, mixed with other materials (asphalt, concrete) and affecting suitability for reuse under the pavement
- Be at a depth of emplacement to minimise risk of pavement failures and impact on underground utilities
- Be in an area free of drainage structures and utilities which will require maintenance
- Be in an area off line to the critical path of road construction
- Be where excavation can be undertaken relatively easily
- Allow easy access for maintenance, inspection and revegetation work
- Avoid additional clearing or impact on threatened species or Endangered Ecological Communities (EECs)
- Minimise flood risk
- Not impact on groundwater sources
- Be removed from sensitive receivers.

Prior to on site encapsulation of ACM, the Construction Contractor will prepare a Long-Term Environmental Management Plan (LTEMP) for the encapsulation, in consultation with relevant

statutory authorities and agencies. The LTEMP will be approved by the NSW EPA accredited site auditor. Any required approvals will be obtained by the Construction Contractors. The Construction Contractors will submit the LTEMP, including details of consultation undertaken during its development and copies of any applicable statutory documentation, to the TfNSW Environment and Sustainability Manager (or delegate) for approval at least four weeks prior to on site encapsulation of ACM. The TfNSW ESM (or delegate) will assess the proposed encapsulation plan for consistency with TfNSW specifications and other requirements.

The LTEMP will include at minimum:

- Details regarding final location and capping thickness of the completed ACM encapsulation sites. Location details is to include proximity markers from features (e.g. proximity from structures, stormwater, services or other features) to clearly identify the position of the encapsulation on site
- As built drawings of the completed ACM encapsulation sites and certification that the encapsulation has been undertaken in accordance with these drawings. Certification to include signed or stamped works-as-executed drawings or similar
- Procedures associated with maintenance and monitoring (including a maintenance and inspection schedule) of the completed ACM encapsulation sites.

2.2.11 Community notification

Notification to the community for asbestos related works will be consistent with statutory requirements. Adjacent sensitive receivers may be notified based on the risk.

3 Monitoring, reporting and records

3.1 Monitoring

The Construction Contractor's ESR may recommend that, as a precaution during asbestos removal works, continuous asbestos fibre monitoring be carried out at the perimeter of the area, and if deemed necessary, personal exposure asbestos fibre air monitoring for workers in area.

During the remedial works, air monitoring for respirable fibres may be conducted on each of the project area boundaries (i.e. areas with potential asbestos impact, stockpile site and placement site), to be defined at the commencement of site remediation works, for the duration of the works. Additional downwind monitoring locations will be included in the monitoring program, as required.

Air monitoring will be conducted in accordance with the requirements of the *National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes*, in particular, the *Guidance note for the estimation of Airborne Asbestos Fibres* (2nd Edition) [NOHSC 3003 (2005)]. Monitoring will also be undertaken in accordance with *How to Safely Remove Asbestos Code of Practice* (Safe Work Australia, 2011).

3.2 Reporting

Any asbestos finds will be reported by the Construction Contractor's ESR to the TfNSW ESM (or delegate) and the EPA in accordance with the Environmental Incident Classification and Reporting Procedure (refer Appendix A7 of the OCEMP).

3.3 Asbestos register

The Construction Contractors will maintain an Asbestos Register that documents all identified or potential asbestos-containing material in the Project area. The Asbestos Register will contain the following information:

- Identification of any potential or asbestos-containing material
- Location, type and condition of the asbestos-containing material
- Date when the asbestos was identified
- Labelling of the asbestos
- Maps, photographs or diagrams detailing the location of the asbestos within the Project area.

The Asbestos Register will be made available to the TfNSW ESM (or delegate) on request for inclusion in Project Monthly Reports.

Attachment 1: Asbestos management feasibility screening assessment

This encapsulation screening assessment evaluated whether it is feasible that ACM impacted materials be encapsulated under road structures or other permanent structures on the Project site. If it is feasible to encapsulate ACM, then subsequent cost assessment (Attachment 2) must be completed to assess whether the proposed encapsulation should be approved.

Factors for Consideration	Yes/No	Comments to support response
Is there opportunity to encapsulate ACM under the road pavement structure or another approved structure?		
Is the volume of ACM greater than 1000 m ³ ? (Encapsulation of less than 1,000 cubic metres of ACM on any Project site is unlikely to be cost effective on a whole-of-life basis)		
Is there sufficient time and opportunity within the Project program and staging to effectively manage ACM in an encapsulation?		
Is the proposed encapsulation location located so that it will not impact or cause concern to external stakeholders (including adjoining landowner/community, local Council or NSW EPA)		
Are concentration of other potential chemicals of concern assessed as suitable for the proposed encapsulation?		
Is the proposed encapsulation above the potential highest level of the groundwater table?		
Is the proposed encapsulation located away from current or future areas of underground services?		
Is the proposed encapsulation located in an area that is not impacted by acid sulfate soils?		

Is the answer to all of the questions 'Yes'?

Yes If 'Yes' the encapsulation option is considered feasible for this Project. Proceed with the Whole-of-life Cost Assessment (Attachment 2).

No If 'No', the encapsulation of ACM is not considered an appropriate option for this Project.



Assessment prepared by: Construction Contractor Environmental Site Representative Name: Signature: Date:	Assessment reviewed by: TfNSW Environment and Sustainability Manager Name: Signature: Date:
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Attachment 2: Asbestos management cost and feasibility assessment

Any proposed ACM encapsulation must be demonstrated to provide whole-of-life cost savings to the NSW Government and the community. To support management option approval cost estimates should be developed to enable a comparison of each option. The table below provides guidance on the elements to be considered for each option.

Cost estimate considerations	
Source removal and off-site disposal	Encapsulate
- Initial assessment costs to assess the extent of asbestos impacts (professional fees and laboratory costs) - Plant and labour to excavate, stockpile and haul asbestos - Haulage costs - Disposal costs - Landfill levy - Purchase materials to reinstate remediation excavation (if required) - Labour and plant to reinstate remediation excavations (if required) - Professional services to manage WHS risks (asbestos assessors, air monitoring and reporting).	- Initial assessment costs to assess the extent of asbestos impacts (professional fees and laboratory costs), preparation of containment strategy and approvals, and NSW EPA Site Auditor review - Plant and labour to excavation, and stockpile/segregate materials - Haulage costs - Labour and plant to place asbestos impacted soil in designated area - Purchase materials to cover buries asbestos impacted materials (e.g. clean fill, geotextile, other) - Professional services to manage WHS risks, during works (asbestos assessors, air monitoring and reporting), and prepare validation report/EMP - Site management costs over longer term (e.g. periodic inspection, maintenance of capping layer, etc). Costs to be presented in net present value.