

Construction Contaminated Land Management Plan

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Document Approval

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01	1/06/2016	CDS-JV				
02	1/11/2016	CDS-JV				
Signature:						



Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this Plan is reviewed and approved. The Support Services Director is responsible for updating this Plan to reflect changes to the Project, legal and other requirements, as required.

Amendments

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

Revision Details

Revision	Details
00	Issue for consultation with Site Auditor and key stakeholders
01	Issued to DP&E
02	Update to address DP&E comments

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1. Introduction

1.1 Context

The New M5 Project is the Stage 2 component of the WestConnex scheme, a NSW Government initiative to connect Sydney's west and south-west with the Sydney Airport and the Port Botany precinct. It is being delivered by the Sydney Motorway Corporation (SMC), formerly the WestConnex Delivery Authority (WDA).

The CPB Dragados Samsung Joint Venture (CDS-JV) will deliver the design and construction of WestConnex Stage 2 referred to as the WCX New M5 (the Project). The Project will run from the existing M5 East corridor at Beverly Hills via tunnel to St Peters, providing improved access to the airport, south Sydney and Port Botany precincts. The Project will substantially improve the east - west corridor access between the Sydney Central Business District, Port Botany and Sydney Airport precincts and the South West growth areas.

The Project will deliver approximately nine kilometres of two-lane twin tunnels with capacity to operate three lanes in the future, motorway to motorway connections to the King Georges Road Interchange Upgrade at Beverly Hills, and a new interchange at St Peters. Infrastructure Approval was received on 20 April 2016 and major works are expected to commence in mid-2016, with the WCX New M5 tunnel is scheduled to open to traffic in late 2019.

This Construction Contaminated Land Management Plan (CCLMP) has been developed to set out the Project strategy for the assessment and management of contaminated land during construction. It cites the requirements for the completion and documentation of a series of site specific contamination assessments and the preparation of site specific remediation and/or management plans to be implemented during construction. The CCLMP has been prepared in response to a requirement under Project Conditions of Approval (CoA). Specifically it responds to CoA B31 and D54 (refer to Section 2.2).

As noted in CoA D54, the CCLMP excludes contamination at the Alexandria Landfill site. A separate Landfill Closure Management Plan (LCMP) has been developed to manage contamination at this site.

1.2 Objectives of this Plan

This CCLMP describes the strategy to be adopted by CDS-JV to identify, assess, manage and mitigate impacts associated with potential areas of contamination that, where identified, may pose a risk to health and the environment during construction.

Implementation of the strategy should ensure an efficient, staged, and transparent/ auditable process for the identification, assessment, mitigation (remediation) and/or management of contamination within the Project footprint. The process defined under the strategy, if implemented to an appropriate standard, should also minimise the risk of land, within the Project footprint, being determined as unsuitable for the proposed land use.

The objectives of this Plan include:

- Ensuring that potentially contaminated sites are identified, assessed and managed in accordance with legislative and Project specific requirements.
- Ensuring appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts from contaminated materials within the Project footprint.
- Ensure contaminated land is managed to achieve criteria appropriate for the proposed future land suitability as a road corridor and/or public open space.
- Ensure that migration of contamination off the Project site does not occur as a result of construction activities associated with the Project.
- Deal with any unexpected finds of contaminated material in a manner that minimises risk to human health and the environment.

1.3 Scope

The CCLMP specifically documents:

- The nature of construction activities with the potential to disturb contamination;

- Locations identified within the Project footprint which have the potential to expose areas known to contain, or potentially contain, contamination;
- An outline of the contamination assessment and management process, which includes the necessary reviews to ensure contamination within the Project footprint will be remediated and/or managed to a level to facilitate site suitability for the interim and/ proposed land use. Specifically the review process includes independent audit using a Site Auditor accredited under the NSW Site Auditor Scheme (administered by the Contaminated Land Management Act (CLM Act) 1997).
- General description of possible mitigation measures for managing contamination, including the handling, treatment and management of contamination;
- General description of the monitoring, auditing and reporting of actions and mitigation measures;
- The Unexpected Finds process to manage potentially contaminated materials that may be encountered during site establishment and / or construction works.
- An outline of the review and improvement process for this Plan.

A NSW Accredited Site Auditor has been engaged by CDS-JV to undertake independent reviews of various documentation generated under the strategy defined by this Plan, thereby providing an increased certainty to the Department of Planning and Environment (DP&E) NSW and other stakeholders (local Councils and the NSW Environment Protection Authority (EPA)) about the suitability of the Project site for the proposed land use or the extent and nature of contamination.

This CCLMP will be an active management document and as such, as additional information becomes available, this Plan may be updated.

As noted in Section 1.1, site specific contamination assessments and remediation and/or management plans, to be implemented during construction, will be prepared in response to the strategy. Preparation of this document set will be staged as various sites become available for assessment and/or management. The document set will be subject to an independent technical review process by a NSW EPA Site Auditor accredited under the *CLM Act 1997*.

This document set will include a management plan which presents mitigation measures to minimise sediment mobilisation as a result of construction activities at the Alexandra Canal.

1.4 Interface with Other Plans

This CCLMP is a standalone Plan for the management of contamination within the Project footprint. Whilst this document links with the Construction Environmental Management Plan (CEMP) as outlined in the CEMP framework presented in Table 1, and makes specific reference to plans and sub plans prepared under the CEMP, the procedures described herein are independent.

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Table 1: New M5 CEMP Framework

Construction Environmental Management Plan	Sub-Plans to CEMP	Sub-Plan attachments	Standalone Documentation (linked to CEMP)
	Construction Air Quality Sub Plan	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Sustainability Plan • Ancillary Facilities Management Plan • Manage Air Quality Procedure
	Construction Noise and Vibration Sub Plan	<ul style="list-style-type: none"> • Out of Hours Works Protocol • Blast Management Strategy 	<ul style="list-style-type: none"> • Land Use Survey • Sustainability Plan • Ancillary Facilities Management Plan • Manage Environment Noise Issues Procedure
	Construction Traffic & Access Sub Plan	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Traffic Management Plans • Ancillary Facilities Management Plan • Local Road Dilapidation Report • Road Safety Audit
	Construction Soil & Water Quality Sub Plan	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Flood Mitigation Strategy • Groundwater and Soil Salinity Report • Sustainability Plan • Geotechnical Model • Ancillary Facilities Management Plan • Construction Contaminated Land Management Plan • Manage Contaminated Land Procedure • Manage Soil and Water procedure Water Quality Plan and Monitoring Program • Acid Sulfate Soil Management Procedure • Asbestos Guideline
	Construction Heritage Sub Plan	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Sustainability Plan • Geotechnical Model • Ancillary Facilities Management Plan • Manage Cultural Heritage Procedure
	Construction Flora & Fauna Sub Plan	<ul style="list-style-type: none"> • Pathogen and Weed Management Strategy • Nest Box Management Plan • Ecological Monitoring Program • Microbat Management Plan 	<ul style="list-style-type: none"> • Sustainability Plan • Ancillary Facilities Management Plan • Arnccliffe Construction Compound Sub Plan • Urban Design and Landscape Management Plan • Biodiversity Offsets Package • Manage Flora and Fauna Procedure
	Waste and Resource Sub Plan	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Sustainability Plan • Manage Waste Procedure
	Energy Efficiency and Greenhouse Gas Emissions Strategy	<ul style="list-style-type: none"> • NA 	<ul style="list-style-type: none"> • Sustainability Plan

2. Project Planning Commitments and Approval

Project Approval was granted under Part 5.1 of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*. The Project is declared to be State Significant Infrastructure (SSI) under the *EP&A Act* and accordingly was subject to assessment under Part 5.1 of the *EP&A Act*, requiring the approval of the Minister for Planning. An Environmental Impact Statement (EIS) was therefore also required.

On 11 August 2015, the Commonwealth Minister for the Environment determined that the project has the potential to significantly impact on a matter of national environmental significance and is therefore a ‘controlled action’. This means that Approval of the project is also required from the Commonwealth Minister for the Environment in addition to environmental and planning approvals required under State legislation on account of it having the potential to significantly impact on a matter of national environmental significance. The Project EIS was able to be adopted for the purpose of meeting the assessment requirements of both the Commonwealth *EPBC Act 1999* and the *NSW EP&A Act 1979*.

This CCLMP has been prepared with consideration of Project requirements, including: to address the mitigation measures listed in the New M5 EIS; the Submissions and Preferred Infrastructure Report (SPIR) and the Conditions of Approval for the Project relevant to contamination.

2.1 EIS Contamination Assessment and Commitments

2.1.1 Contamination Management Requirements

The Revised Environmental Management Measures (REMMs) included in the EIS and SPIR relating to the management of contamination during construction are included in Table 2. These mitigation and management measures are required to be addressed and implemented during the construction for the New M5 Project.

Table 2: Revised Environmental Management Measures from New M5 EIS relevant to the management of the contamination during construction

Reference	Requirement	Where addressed
REMM CM03	Potentially contaminated areas directly affected by the project would be investigated and managed in accordance with the requirements of guidance endorsed under section 105 of the CLM Act. This includes further investigations in areas of potential contamination identified in the construction footprint.	Under this Plan
REMM CM04	An unexpected finds and hazardous materials procedure would be implemented to manage any potentially contaminated materials that may be encountered during site preparation and / or construction works.	Manage Contaminated Land Procedure
REMM CM05	Waste management plans, as part of the CEMP, would include procedures for handling and storing potentially contaminated spoil and, should off-site disposal be required, undertaking waste assessment and classification for off-site disposal to appropriately licenced waste facilities. See Chapter 24 (Resource use and waste minimisation) of the EIS for more information.	Construction Waste and Resource Sub Plan
REMM CM06	Site specific asbestos management plans would be developed where relevant. Refer to Chapter 24 (Resource use and waste minimisation) for further information on asbestos management.	Manage Work with Asbestos (M5N-ES-GUI-PWD-0001)
REMM CM07	A hazardous materials assessment would be carried out prior to and during the demolition of buildings. Demolition works would be undertaken in accordance with the relevant Australian Standards and relevant NSW WorkCover ¹ Codes of Practice, including the <i>Work Health and Safety Regulation 2011</i> .	Project WHS Management Plan (M5N-HS-PLN-PWD-0001)

¹ Now known as SafeWork, NSW

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Reference	Requirement	Where addressed
		Manage Work with Asbestos (M5N-ES-GUI-PWD-0001)
REMM CM08	A dangerous goods search of the WorkCover NSW ¹ records for licenced dangerous good would be undertaken prior to construction.	Phase 1 ESA reports prepared under this Plan
REMM CM09	An explosive ordnance due diligence assessment would be completed at the identified former ammunition site (Project area 3), located between Flatrock Road, Bexley Road and Wolli Creek.	Site specific Phase 1 ESA report prepared under this Plan
REMM CM10	In the event of encountering unexpected finds of contamination (i.e. the observation of offensive odours, soil discoloration, buried waste or potential asbestos containing materials) during construction, work in the area would cease until an appropriately qualified environmental consultant can advise on the need for further assessment, remediation or other action, as deemed appropriate. Further assessment and management of contamination, if required, would be undertaken in accordance with section 105 of the CLM Act. (Authors Note: The above reference to section 105 of the CLM Act. Should be read as the guidelines made or approved by the EPA under section 105 of the CLM Act.)	Manage Contaminated Land Procedure
REMM CM11	Appropriate mitigation measures to minimise sediment mobilisation as a result of construction activities at the location of the new stormwater infrastructure at Alexandra Canal would be detailed in the CEMP in accordance with the requirements of the Remediation Order in consultation with NSW EPA and Sydney Water. Measures would be detailed in an Alexandra Canal Contamination Management Plan.	Plan to be prepared under this Plan
REMM CM12	Appropriate mitigation measures including stockpiling and management of potentially contaminated material would be undertaken at construction compounds to prevent movement of material into receiving waters.	Construction Soil & Water Quality Sub Plan Site Specific RAPs
REMM CM13	Plant, equipment and supplies would be managed to prevent spills and leaks. See Chapter 26 (Hazard and risk) of the EIS for more information.	CEMP Construction Soil & Water Quality Sub Plan Manage Hazardous Substances Procedure
REMM CM14	Tunnel washing water and waste would be appropriately contained, treated and disposed of. Refer to Chapter 24 (Resource use and waste minimisation) of the EIS for more information.	CEMP Construction Soil & Water Quality Sub Plan
REMM CM15	Further in situ testing of soils in areas of known potential contamination to determine waste classification.	Phase 2 ESAs reports prepared under this Plan Construction Soil and Water Quality Sub Plan Construction Waste and Resource Sub Plan

2.1.2 Identified Areas of Concern

The Project EIS included the preparation of WestConnex New M5 Technical Working Paper: Contamination (AECOM 2015). This paper details the findings of an overarching Phase 1 Environmental Site Assessment (ESA) completed as part of the EIS process to identify areas of potential contamination concern provide a preliminary assessment of contamination risks associated with the surface disturbance areas of the Project study area.

The paper divides the project study area into the following five areas:

- Western surface works;
- Kingsgrove Road surface works;
- Bexley Road surface works;
- Arncliffe surface works at Kogarah Golf Course; and
- St Peters interchange and local road upgrades.

Based on a review of available information, a preliminary contamination risk evaluation of identified areas of potential concern was undertaken using a risk matrix. Low, Medium or High risks were assigned to each identified area of contamination concern. A total of 34 sites were identified within the Project study area as requiring further investigation to assess for potential Medium and High contamination risks.

For sites located in the current project footprint; and identified in the EIS as requiring further investigation (on the basis of an identified moderate to high risk of contamination present at the site), the findings of the Phase 1 ESA are being updated under this Plan. This includes, as required, addressing desktop review data gaps (e.g. SafeWork NSW Dangerous Goods Searches) and undertaking walk over inspections at sites with previously limited access.

The update of the Phase 1 ESA will also include consideration of the latest available information relating to the nature and extent of anticipated site disturbance activities proposed by CDS-JV.

The 34 sites identified as areas of concern in the EIS are presented in Appendix B as a table and location maps. Where practical, for efficiency a number of sites have been merged for further consideration under this Plan.

2.2 Planning Approval Conditions

Project Approval for SSI 6788 was determined on 20 April 2016. Conditions of Approval that specifically address management of contamination are identified in Table 3.

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Table 3: Conditions of Approval that address contamination management

Reference	Requirement	Where addressed
B31	<p>Prior to the commencement of any activities that would result in the disturbance of land and/or soil, or as otherwise agreed by the Secretary, in areas identified as having a moderate to high risk of contamination, a Soil Contamination Report must be prepared by a suitably qualified person(s) in accordance with the requirements of the Contaminated Land Management Act 1997 and associated guidelines, detailing the outcomes of Phase 2 contamination investigations within these areas. The Soil Contamination Report must detail, where relevant, whether the land is suitable (for the intended land use) or can be made suitable through remediation and/or outline the potential contamination risks from the SSI to human health and receiving waterways.</p> <p>For land to be disturbed by the SSI, where the investigations identify that the site is suitable for the intended operations and that there is no need for a specific remediation strategy, measures to identify, handle and manage potential contaminated soils, materials and groundwater must be identified in the Soil Contamination Report and incorporated into the Construction Environmental Management Plan, unless otherwise agreed by the Secretary. Should a remediation strategy be required, the Soil Contamination Report must include a Remediation Action Plan for addressing the disturbed area, and how the environmental and human health risks will be managed during the disturbance, remediation and/or removal of contaminated soil or groundwater.</p> <p>If remediation is required, the Soil Contamination Report must be accompanied by a Site Audit Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the disturbed area has been or can be remediated to a standard consistent with the intended land use. Where land is remediated, a final Site Audit Statement(s) must be prepared by an accredited Site Auditor, certifying that the contaminated disturbed areas have been remediated to a standard consistent with the intended land use. The final Site Audit Statement must be submitted to the Secretary and relevant councils prior to operation of the SSI, unless otherwise agreed to by the Secretary.</p>	<p>Within site specific contamination reports</p> <p>It is noted that the reference to the “incorporation into the Construction Environmental Management Plan” is an error and it should reference the Construction Contamination Management Plan in D54</p>
D54	<p>The Proponent must prepare and implement a Construction Contamination Management Plan to manage potential contamination impacts during construction of the SSI (excluding contamination covered by the Landfill Closure Management Plan for the Alexandria Landfill site). The Construction Contamination Management Plan must be developed in consultation with the EPA and relevant councils, and include, but not be limited to:</p>	<p>This Plan.</p>
	<p>(a) details of construction activities and their locations which have the potential to expose areas known to contain, or potentially contain, contaminated soils and/or materials;</p>	<p>See Section 4 and 2.1</p>

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Reference	Requirement	Where addressed
	(b) details of management measures to minimise bed sediment mobilisation in Alexandra Canal. All measures must comply with the actions required of Remediation Order HO1833, 230041 Area #3151 issued by the EPA on 10 May 2004;	An Appendix C within this Plan (to be provided when detailed design information is available)
	(c) measures for the handling, treatment and management of hazardous and contaminated soils, materials and groundwater including measures to manage and/or minimise public health and safety concerns with regards to exposure to contamination;	Section 7.2 and the Waste and Resource Management Plan
	(d) an Unexpected Finds Procedure detailing procedures and management measures to be implemented in the event that contaminated material is uncovered in any area not identified in the documents referred to in conditions A2(b), A2(c) and A2(e);	Section 7.2
	(e) a description of how the effectiveness of the actions and measures for managing contamination impacts would be monitored during the proposed works, clearly indicating how often this monitoring would be undertaken, the locations where monitoring would take place, and how the results of the monitoring would be recorded and reported; and	Section 8 and within site specific RAPs and/or LT-SEMPs
	(f) mechanisms for the monitoring, review and amendment of this Construction Contamination Management Plan.	Section 9
	The Construction Contamination Management Plan must be submitted to the Secretary prior to undertaking any works which may result in the disturbance of contaminated soil, land or materials. Nothing in this condition prevents the Proponent from preparing separate Construction Contamination Management Plans for specific areas of work, rather than a plan which addresses the entire SSI.	This Plan

3. Other Legislative and Guideline Requirements

The Minister for Planning is the consent authority for the Project; however, the City of Sydney Council, Marrickville Council, Rockdale City Council, City of Canterbury Council and Hurstville City Council as well as the NSW EPA are listed as stakeholders for consultation during the development of the CCLMP.

The other principal laws and legislative instruments applying to the management of contamination for this Project are described below.

3.1 Contaminated Land Management Act 1997

In NSW, the management of contaminated land is shared by the NSW EPA, the Department of Planning and Environment (DP&E) and planning consent authorities (usually local councils).

The *NSW Contaminated Land Management (CLM) Act 1997* is the primary Act under which contaminated land is regulated by the NSW EPA for land located in NSW. Under Part 3 of the *CLM Act 1997* the NSW EPA regulates contaminated sites where the contamination is Significant Enough to Warrant Regulation (SEWR). Alexandra Canal is regulated under the *CLM Act 1997*.

There is also a duty for landowners to, and persons who have responsibility for contamination to, notify the EPA under s60 of the *CLM Act* where contamination is identified that is potentially SEWR. Contaminated sites that are not regulated by the NSW EPA are managed by local councils through land use planning processes. As the Project is State Significant Infrastructure contaminated sites that are not regulated by the NSW EPA shall be managed through DP&E land use planning processes (as the consent authority) in consultation with local councils.

NSW EPA also administers the NSW Site Auditor scheme under Part 4 of the *CLM Act 1997*, makes or approves guidelines for use in the assessment and remediation of contaminated sites, and administers the public record of regulated sites under the *CLM Act 1997*.

Where there is a requirement for a Site Audit Statement under the CoA (B31) they must be prepared by a Site Auditor accredited under the *Contaminated Land Management Act 1997 (CLM Act)*.

As such it is implicit that assessment of contamination and remediation of land under the Project is completed in accordance with the guidelines made or approved under section 105 of the *CLM Act 1997*.

3.2 Protection of Environment Operations Act

The objectives of the *POEO Act* are to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development. The requirements of the *POEO Act* and associated schedules and regulations are relevant to the assessment and management of contaminated land and prevention of contamination to land.

The *POEO Act* defines 'waste' for regulatory purposes and establishes management and licensing requirements, including waste classification, resource recovery exemptions, general immobilisation approvals and requirements for immobilisation of wastes.

The *POEO Act* prescribes certain activities as 'scheduled' activities' that may only be conducted in accordance with the conditions of an Environment Protection Licence (EPL). An application for an EPL has been lodged with the EPA.

3.3 Protection of the Environment Operations (Waste) Regulation 2014

The *POEO Act* defines 'waste' for regulatory purposes and establishes management and licensing requirements, including waste classification, resource recovery exemptions, general immobilisation approvals and requirements for immobilisation of wastes. The *Protection of the Environment (Waste) Regulation 2014* provides for the exemptions and orders for the reuse of waste, particularly the use of waste that is to be applied to land. The *Waste Regulation* also outlines the required documentation and approvals required for the handling, off-site transport and disposal of waste (including Hazardous Waste) during the Project.

3.4 Other Legislation and Guidelines

Additional legislation and guidelines relevant to the CCLMP include:

- Work Health and Safety Act (and Regulation) 2011;
- Water Management Act 2000;
- Waste Avoidance and Resource Recovery Act 2001;
- Australian Standards and Codes of Practices; and
- Sydney Water Act 1994

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in the CEMP.

3.5 Guidelines and Relevant Documents

The procedures for identification, assessment, and remediation and management of contamination are documented in various guidance documents endorsed by the NSW EPA under Section 105 of the *CLM Act 1997*.

The main guidelines, specification and policy documents relevant to this CCLMP include:

- ANZECC/ARMCANZ, 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, Canberra.
- DEC 2006, Guidelines for the NSW Auditor Scheme (2nd Edition), Department of Environment and Conservation NSW.
- DEC 2007, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination. NSW EPA, Sydney.
- EPA 1995, Contaminated Sites: Sampling Design Guidelines. NSW EPA, Sydney.
- EPA 2014, Waste Classification Guidelines, Part 1: Classifying waste. NSW EPA, Sydney.
- NEPC 2013, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, National Environment Protection Council; and
- OEH 2011, Guidelines for Consultants Reporting on Contaminated Sites, Office of Environment and Heritage.

4. Surface Disturbance Construction Activities

Table 4 presents the site description and key construction surface work activities that have the potential to expose areas of known or potential contamination. Table 4 lists:

- the 14 identified construction compound sites (C1-C14 inclusive);
- the Alexandra Canal, an area of known sediment contamination currently managed under an NSW EPA Notice under the *CLM Act 1997*;
- Temporary construction power enabling alignment; and
- Road construction work areas not within defined construction compounds, including road and bridge construction areas.

Further information for construction compound activities is provided in the Ancillary Facilities Management Plan (AFMP) (M5N-ES-PLN-PWD-0026-03).

Table 4: Area Description and Proposed Key Work Activities with the Potential to Expose Contamination

Site Description	Key Work Activities with the Potential to Expose Contamination
Kingsgrove North (C1) Construction Compound Site	
<p>The Kingsgrove North construction compound (C1) would be located on the northern side of the existing M5 East Motorway between Canterbury Golf Course and Garema Circuit, Kingsgrove. The Kingsgrove North construction compound site is located within Beverly Grove Park, Kingsgrove.</p> <p>The site would service the construction works between the western limit of works and the eastbound tunnel portal, including construction of the dive structures and cut-and-cover tunnel sections and realignment of the M5 Motorway to accommodate the tunnel portals.</p> <p>This site also provides an off-motorway connection to the Kingsgrove South Compound, via the Kindilan underpass, removing the need to travel on local roads.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation and construction of site fencing, a temporary noise barrier is proposed for the northern boundary, lighting, signage. - Realign the existing shared pedestrian and bicycle path that currently passes through the site. - Demolition of existing structures. - Clearing and grubbing and stockpiling of topsoil. - Bulk earthworks for the installation of sedimentation pond. - Construction of access road including earthworks, pavements, kerb and gutter and fencing. - Relocation of RMS signage and ITS system. - Foundations and sealing of surfaces. - Installation of laydown and storage areas/facilities. - Construction of water treatment plant. - Installation of fuel storage and re-fuelling bay. - Construction of internal haul roads including access road to tunnel shaft site to the east of the compound. <p>Construction</p> <ul style="list-style-type: none"> - Cut and cover/dive structures: earthworks, piling, installation of capping beams and roof structure. - Construction of bridge structures and retaining walls. - Roads and ramps: earthworks, road widening, pavements, retaining walls, barriers, road furniture, ITS.
Kingsgrove South (C2) Construction Compound Site	
<p>The Kingsgrove South construction compound would be located to the south of existing M5 East Motorway, within Beverly Grove Park, Kingsgrove.</p> <p>The construction compound would primarily be used to service the construction of the western surface worksite.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Foundations and sealing of surfaces. - Installation of laydown and storage areas/facilities. <p>Construction</p> <ul style="list-style-type: none"> - Reconfiguration of traffic access. - Surface road works. - Construction of the permanent Kingsgrove South motorway operations complex (MOC1).
Commercial Road (C3) Construction Compound Site	
<p>The Commercial Road construction compound would be located between Tallawalla Street, Kingsgrove and Commercial Road, Kingsgrove, on the southern side of the Motorway.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Demolition of existing structures. - Clearing and grubbing and stockpiling of topsoil. - Earthworks and spoil removal.

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Site Description	Key Work Activities with the Potential to Expose Contamination
<p>The site would service surface infrastructure construction works between the western limit of works and the tunnel portals.</p>	<ul style="list-style-type: none"> - Construction of access road including earthworks, pavements, kerb and gutter and fencing. - Foundations and sealing of surfaces. - Piling for crane pad and footings. - Installation of laydown and storage areas/facilities. - Installation of spoil shed and construction water treatment plant. - Installation of fuel storage and re-fuelling bay. - Installation of electrical substation including cabling and earthing. - Installation of mains water supply to site. - Construction of on-site car parking. - Installation of any additional plant and equipment required for construction activities. - Traffic control works and establishment of the access point to Commercial Road. <p>Construction</p> <ul style="list-style-type: none"> - Operation of staff amenities, parking and site infrastructure generally - Operation of workshop - Deliveries, including concrete and shotcrete - Stockpile/laydown - Storage of plant and equipment not in use - Storage of fuels and chemicals - Shaft excavation - Launch of a road header - Tunnelling: excavation, blasting and profiling (as per EPL) - Spoil management and offsite removal utilising spoil shed - Tunnel support activities including provision of ventilation, water treatment plant, water supply, electricity supply - Tunnel fit out: rock sawing and hammering, permanent services and finishes, paving, install road furniture.
Bexley Road North Compound (C4)	
<p>The Bexley Road North construction compound is located on the western side of Bexley Road, Kingsgrove and north of the M5 East motorway. It is located within an area of fenced vacant land bound by the intersection of Bexley Road and Poole Street, Kingsgrove in the north, Bexley Road, Kingsgrove in the east, the M5 East motorway in the south and residential properties along Flatrock Road and Jones Avenue, Kingsgrove on the west.</p> <p>An acoustic shed no higher than 20m will be established containing the shaft entry, a spoil stockpile area and sufficient space for two heavy vehicles to be loaded with spoil.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Realign the existing shared pedestrian and bicycle path. - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Demolition of existing structures. - Clearing and grubbing and stockpiling of topsoil. - Earthworks and spoil removal. - Preparation earthworks to accommodate the site layout. - Foundations and sealing of surfaces. - Piling for crane pad and footings. - Installation of laydown and storage areas/facilities. - Installation of spoil shed and construction water treatment plant. - Construction of on-site car park. - Installation of electrical substation including cabling and earthing. - Relocation of existing monitoring station. - Installation of mains water supply to site. <p>Construction</p> <ul style="list-style-type: none"> - Shaft excavation. - Launch of road headers. - Tunnelling: excavation, blasting and profiling. - Spoil management and offsite removal utilising spoil shed. - Tunnel support activities including provision of ventilation, water treatment plant, water supply, electricity supply. - Tunnel fit out: rock sawing and hammering, permanent services and finishes, paving, install road furniture.
Bexley South (C5) Construction Compound Site	
<p>The Bexley Road South construction compound is located within Kingsgrove Avenue Reserve on the western side of Bexley Road, Kingsgrove to the south of the M5 East Motorway tunnel in an area of</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Demolition of existing structures. - Clearing and grubbing, tree removal and stockpiling of topsoil and mulch.

Construction Contaminated Land Management Plan



Site Description	Key Work Activities with the Potential to Expose Contamination
<p>open space, currently used for public recreation.</p> <p>The site would be used for tunnelling support during construction and Bexley Road South motorway operations complex (MOC2) for operation.</p> <p>An acoustic shed no higher than 20m will be established containing the shaft entry, a spoil stockpile area and sufficient space for two heavy vehicles to be loaded with spoil.</p>	<ul style="list-style-type: none"> - Earthworks and spoil removal. - Preparation earthworks to accommodate the site layout. - Foundations and sealing of surfaces. - Piling for crane pad and footings. - Installation of laydown and storage areas/facilities. - Installation of spoil shed and construction water treatment plant. - Construction of on-site car park. - Installation of electrical substation including cabling and earthing. - Installation of mains water supply to site. <p>Construction</p> <ul style="list-style-type: none"> - Launch of road headers. - Tunnelling: excavation, blasting and profiling. - Spoil management and offsite removal utilising spoil shed. - Tunnel support activities including provision of ventilation, water treatment plant, water and electrical supplies. - Tunnel fit out: rock sawing and hammering, permanent services and finishes, paving, install road furniture. - Construction of permanent operational facilities including emergency smoke extraction facility, operational water treatment facility, electricity distribution substation.
Bexley East (C6) Construction Compound Site	
<p>The Bexley Road East construction compound would be located on the eastern side of Bexley Road, Earlwood south of the intersection with Wollie Avenue on land currently used to support the operation of the M5 East Motorway.</p> <p>The site will be used mainly for car parking and administrative support activities for the Bexley Road North construction compound (C4) and Bexley Road South compound (C5).</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Clearing and grubbing and stockpiling of topsoil. - Earthworks and spoil removal. - Preparation earthworks to accommodate the site layout. - Foundations and sealing of surfaces. - Installation of laydown and storage areas/facilities. - Installation of mains water supply to site. - Construction of on-site car park. <p>Construction</p> <p>The construction activities, as outlined in the Ancillary Facilities Management Plan are not anticipated to include ground disturbing work.</p>
Arncliffe (C7) Construction Compound Site	
<p>The Arncliffe construction compound is located within the Kogarah Golf Course within a recreational area south of Marsh Street, Arncliffe and east of the junction with the M5 East Motorway.</p> <p>The site is for civil construction activities and for tunnelling support including laydown areas, a construction water treatment plant, spoil stockpile, non-acoustic shed, access shaft, staff and administrative facilities, laydown areas, construction water treatment plant, non-acoustic shed for shaft and stockpile</p> <p>During operation, the site would be occupied by the Arncliffe motorway operations complex (MOC3), including a ventilation facility and water treatment plant.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required. - Clearing and grubbing, tree removal and stockpiling of topsoil and mulch. - Earthworks and spoil removal. - Construction of access road including earthworks, pavements, kerb and gutter and fencing. - Dewater and backfill existing golf course ponds. - Preparation earthworks to accommodate site layout. - Foundations and sealing of surfaces. - Pads for piling rigs and cranes. - Installation of laydown and storage areas/facilities. - Installation of spoil shed and construction water treatment plant. - Installation of fuel storage and re-fuelling bay. - Installation of electrical substation including cabling and earthing. - Installation of mains water supply to site. - Construction of on-site car parking. <p>Construction</p> <ul style="list-style-type: none"> - Excavation of temporary decline access tunnel and shaft including: <ul style="list-style-type: none"> • Piling • Use of excavators, rock-hammers and road headers • Spoil removal - Excavation and lining of permanent shaft. - Launch of road headers. - Tunnelling: excavation, blasting and profiling.

Construction Contaminated Land Management Plan



Site Description	Key Work Activities with the Potential to Expose Contamination
	<ul style="list-style-type: none"> - Spoil management and offsite removal utilising spoil shed. - Tunnel support activities including provision of ventilation, water treatment plant, water and electrical supplies. - Tunnel fit out: rock sawing and hammering, permanent services and finishes, paving, install road furniture. - Construction of permanent operational facilities including emergency smoke extraction facility, operational water treatment facility, electricity distribution substation.
Canal Road Compound (C8)	
<p>The Canal Road construction compound is located within the St Peters interchange site at 1 Canal Road and 316 Princes Highway, St Peters.</p> <p>The construction compound supports tunnelling and civil infrastructure activities.</p> <p>During operation, the site would be occupied by the St Peters motorway operations complex (MOC4), including the St Peters ventilation outlet.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Survey to install control and pick up existing levels - Installation of environmental controls including: <ul style="list-style-type: none"> • Further site investigations • Erosion and sedimentation control • Delineation of sensitive areas - Installation of site fencing, hoarding and any necessary noise walls along the boundary of the compound, lighting, and signage, including piling if required - Embankment stabilisation - Clearing and grubbing and stockpiling of topsoil and mulch - Earthworks and spoil removal - Materials testing, classification and removal of unsuitable materials off site - Construction of access roads including earthworks, pavements, kerb and gutter and fencing - Protection of existing services, utilities and relocations, disconnections and connections where required - Preparation earthworks to accommodate site layout - Foundations and sealing of surfaces - Service investigation including potholing, hand digging, and excavator works. - Demolition of existing buildings including removal of any concrete slabs or support structures including offsite disposal of waste - Construction of piling platforms including earthworks and ground improvement - Piling for crane pad and footings - Installation of staff amenity structures and fit out - Installation of workshop structures and fit out - Installation of laydown and storage areas/facilities - Installation of spoil shed and construction water treatment plant - Installation of fuel storage and re-fuelling bay - Installation of electrical substation including cabling and earthing - Construction of on-site car parking - Installation of any additional plant and equipment required for construction activities - Traffic control works establishment of gates and access points to the Princes Highway and Canal Road. This includes modification to a set of existing signals on Canal Road at the entrance to the "Canal Road Intermodal Terminal" <p>Construction</p> <ul style="list-style-type: none"> - Deliveries of all materials, including shotcrete and concrete and reinforcement - Operation of workshop - Stockpile/laydown - Storage of plant and equipment not in use - Storage of fuels and chemicals - Excavation of temporary decline access tunnel, including: <ul style="list-style-type: none"> • Piling • Use of excavators, rock-hammers and road headers • Use of cranes • Spoil removal • Concrete work - Launch of road headers - Tunnelling: excavation, blasting and profiling (as per EPL) - Spoil management and offsite removal utilising spoil shed - Tunnel support activities including provision of ventilation, water treatment plant, water and electrical supplies

Construction Contaminated Land Management Plan

Site Description	Key Work Activities with the Potential to Expose Contamination
	<ul style="list-style-type: none"> - Tunnel fit out: rock sawing and hammering, permanent services and finishes, paving, install road furniture - Construction of permanent operational facilities including emergency smoke extraction facility, operational water treatment facility, electricity distribution substation. - Removal of site amenities, offices, plant and equipment, sheds and fencing. - Rehabilitation and landscaping of residual land, including backfilling of temporary tunnel access dive. - Excavation of the cut and cover portal structure - Installation of ground anchors and shotcrete - Installation of precast concrete girders, slabs and columns - Concrete works including installation of formwork, steelfixing, and pouring concrete - Installation of a tower crane and other crane works - Drainage and pavement works - Finishing works including landscaping, kerbs, gutters, linemarking, signage, lighting, asphaltting - Construction of building facilities
Campbell Road Compound (C9)	
<p>The Campbell Road construction compound would be located on the southern side of Campbell Road between Woodley Street and Harber Street, St Peters.</p> <p>The construction compound is to be situated on land which currently comprises residential dwellings and commercial and industrial businesses.</p> <p>The compound would be mainly used to support construction of the St Peters interchange and local road upgrades.</p> <p>The construction compound would include a car park for approximately 260 light vehicles, laydown and storage areas, a stockpile, fuel storage, a sedimentation pond and site offices.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Demolition of existing buildings - Establishment of construction compound fencing and hoarding - Vegetation clearance - Construction of hardstands - Installation of sediment and erosion control measures - Installation of site offices and crib rooms - Construction of access roads and security - Set up of spoil sheds and support equipment - Set up of construction monitoring equipment - Relocation of utilities. <p>Construction</p> <p>Local Road upgrades: Removal of existing road pavements, as required</p> <ul style="list-style-type: none"> - Installation of the drainage and utility infrastructure - Installation of road base, lighting, kerb and guttering, verges, medians, and new jersey barriers - Earthworks and excavation - Spoil stockpiling and removal - Installation of final asphaltting layer - Sign installation and street lighting <p>St Peters Interchange</p> <ul style="list-style-type: none"> - Bulk excavation and material disposal - Foundation works to pavements including piling - Structural and flexible pavement construction to St Peters interchange - Construction of the on-and off-ramps - Construction of the St Peters interchange bridges including the Campbell Road pedestrian and cycle bridge, local road upgrades and shared paths - Construction of carriageways - Tie-in with existing roads onto Campbell Road - Construction of retaining walls and landscaping. <p>Finishing works, including asphaltting, linemarking, signage installation and landscaping</p> <ul style="list-style-type: none"> - Demobilisation and removal of construction facilities - Testing and commissioning testing of plant and equipment - Landscaping - Rehabilitation of affected areas - Post-construction condition surveys - Removal of construction environmental controls - Removal of construction ancillary facility related traffic signage.
Landfill Closure Compound (C10)²	

² This site will be managed under the LCMP, required under CoA B32

Construction Contaminated Land Management Plan



Site Description	Key Work Activities with the Potential to Expose Contamination
<p>The Landfill Closure construction compound is located on the southern side of Campbell Road, St Peters and would be used to support closure of the Alexandria Landfill site.</p> <p>The compound would include site offices, amenities, and laydown and material storage areas.</p> <p>The constructed containment mound would contain approximately 70,000 cubic metres of material excavated from a stockpile in the north-western corner of the Alexandria Landfill site.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Site establishment for construction activities associated with the landfill closure works. - Vegetation clearance, topsoil stripping and spreading stockpile. Mulched vegetation would be stockpiled for later reuse in site rehabilitation and landscaping works - Demolition of buildings and other infrastructure - Install Erosion and sedimentation control devices and site areas - Construct hardstand areas, including importing, placing spreading of gravel as well as surfacing works - Install site offices and sheds - Car park construction - Connection of services and utilities such as water, sewer, power etc - Erection of decking and walkways, construction of concrete paths - Installation of site security devices - Installation of road construction drainage infrastructure such as access roads, site fencing and barriers <p>Construction and Landfill Closure Works as well as roadworks</p> <ul style="list-style-type: none"> - Relocation of utilities - Site wide vegetation removal - Installation of erosion and sedimentation devices - Removal of topsoil - Installation of a cut off wall to minimise inflow from the Botany Sands aquifer - Bulk works to produce the final landform - Installation of a capping layer including preparatory works including clearing and levelling the ground surface. - Upgrade of the existing leachate treatment plant, installation of new leachate drainage collection system and decommissioning existing leachate treatment. - Construction of a new leachate treatment plant management system - Installation of a landfill gas collection and management system - Installation of a groundwater management system. - Landscaping and demobilisation. <p>This site office will also be used during the road construction and finishing works:</p> <ul style="list-style-type: none"> - Cut and fill foundation preparation - Installation of permanent drainage systems including pumping infrastructure - Pavement construction - Driven piles and concrete slab - Finishing works including line marking, erection of signs, street lighting, vegetation, safety barriers and verge - Installation of drainage systems and water quality basins
Burrows Road Compound (C11)	
<p>The Burrows Road construction compound would be located on the south-western corner of Campbell Road and Burrows Road, St Peters.</p> <p>The compound would mainly be used to support civil infrastructure construction activities, including construction of the St Peters interchange and the local road upgrades.</p> <p>The Burrows Road construction compound site would be used for the Burrows Road motorway operations complex (MOC5), including the New M5 motorway control centre, for operations.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Site establishment to support construction activities associated with the St Peters Interchange and local road upgrades - Demolition of buildings - Construction of hardstand for overflow car parking - Creation of a laydown area and storage of materials for local road upgrades <p>Construction</p> <ul style="list-style-type: none"> - Construction of the St Peters Interchange and local road upgrades - Construction of Burrows Road motorway operations complex (MOC5) - Demobilisation and rehabilitation
Campbell Road Bridge Compound (C12)	

Construction Contaminated Land Management Plan



Site Description	Key Work Activities with the Potential to Expose Contamination
<p>The Campbell Road bridge construction compound would be located on the south-eastern side of Burrows Road, St Peters opposite Campbell Road on land currently used for commercial business purposes.</p> <p>The compound would be mainly used for the construction of a new bridge across the Alexandra Canal as part of the Campbell Road extension.</p> <p>The compound would include a car park, laydown area, crib area and ablutions facilities.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Site establishment for the construction activities associated with the Campbell Road bridge (vehicle) and Campbell Road pedestrian and cycle bridge across the Alexandra Canal - Demolition of buildings - Utilities relocation <p>Construction</p> <ul style="list-style-type: none"> - Stockpiling of materials for construction works - Support for construction of new bridges across Alexandra Canal as part of the local road upgrades - Works to enable tie in with Campbell Road upgrade works - Laydown and storage area for plant and equipment, and permanent materials for bridge works, including precast concrete - Finishing works including landscaping asphaltting, line marking and signage installation
Gardeners Road Bridge Compound (C13)	
<p>The Gardeners Road Bridge construction compound (C13) is located on the southern side of Burrows Road, St Peters currently used for commercial business purposes.</p> <p>The Gardeners Road bridge construction compound would be used to service the construction of a bridge over the Alexandra Canal, which would connect the St Peters interchange directly with Gardeners Road, Mascot.</p> <p>The compound would include a car park, laydown area, crib area and ablutions facilities. The site would include a crib hut, laydown area and car parking.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Site establishment for construction activities associated with the Gardeners Road bridge - Demolition of buildings - Relocation of utilities <p>Construction</p> <ul style="list-style-type: none"> - Tie-in of the Gardeners Road bridge with the local road upgrades - Storage of bridge construction plant and equipment - Stockpiling of construction materials - Laydown and storage of bridge materials, such as precast concrete - Storage of temporary access platforms for bridge works (western side of the Alexandra Canal) - Pre-assembly of segments, heavy lifts and associated bridge and local road upgrade construction - Finishing works, including landscaping, asphaltting, line marking and signage
C14 Sydney Park Compound (C14)	
<p>The Sydney Park construction compound would be located on the northern side of Campbell Road in Sydney Park, St Peters on an area of open space used for public recreation.</p> <p>The construction compound would be used to service the construction of pedestrian and cycling facilities associated with the local road upgrades, including the Campbell Road pedestrian and cycle bridge over Campbell Road.</p> <p>The land required for the Sydney Park construction compound would be used temporarily throughout construction only and would be rehabilitated at the completion of construction, with the exception of the areas of land required permanently for the footprint of the bridge and pedestrian and cycle paths.</p> <p>The compound would include a car park, laydown area, crib area and ablutions facilities.</p>	<p>Establishment</p> <ul style="list-style-type: none"> - Clearance of vegetation - Construction of hardstand for car parking - Creation of a laydown area and hardstand <p>Construction</p> <ul style="list-style-type: none"> - Construction activities associated with the pedestrian and cycle bridge over Campbell Road - Construction of the bridge over Campbell Road - Construction of a shared pedestrian and cycle path in Sydney Park - plant and equipment laydown and storage area

Construction Contaminated Land Management Plan



Site Description	Key Work Activities with the Potential to Expose Contamination
Alexandra Canal	
<p>Areas of the Canal adjacent to Campbell Road bridge construction compound (C12), St Peters and Gardeners Road bridge construction compound (C13), Alexandria and areas in the vicinity of surface water discharge points</p>	<p>Construction</p> <ul style="list-style-type: none"> - Construction activities associated with the upgrade of surface water discharge points into the Canal - Construction activities associate with the bridges over the Canal
Temporary Construction Power Enabling Works	
<p>The work will be carried out along 5 alignments:</p> <ul style="list-style-type: none"> • Rockdale to Kogarah Golf Course, Arncliffe • Commercial Road, Kingsgrove • Garema Circuit, Kingsgrove • May Street, Mary St to Canal Rd St Peters • Campsie to Poole St, Kingsgrove <p>Each route would be located within the road reserve and adjacent footpaths.</p>	<p>Establishment</p> <p>This proposal comprises installation of cabling and related fixtures to connect Ausgrid utilities from the existing network to the various proposed construction compounds along the alignment of the New M5 project.</p> <p>Works will involve the following construction methods:</p> <ul style="list-style-type: none"> • HDD (Horizontal Directional Drilling) • Trenching • Pipe jacking • Non-destructive excavation work including potholing and slit trenches.
Road Construction Areas	
<p>Areas within the Local Road Upgrades outside of the Construction compounds including along Campbell Rd, Campbell Street, Euston Road, Burrows Road, Bourke Rd, Gardeners Rd and Ricketty St in St Peters and Alexandria.</p>	<p>Construction</p> <ul style="list-style-type: none"> - Construction activities associated with the construction of the local road upgrades - Construction activities associated with bridges and roads at St Peters Interchange

5. Management Process

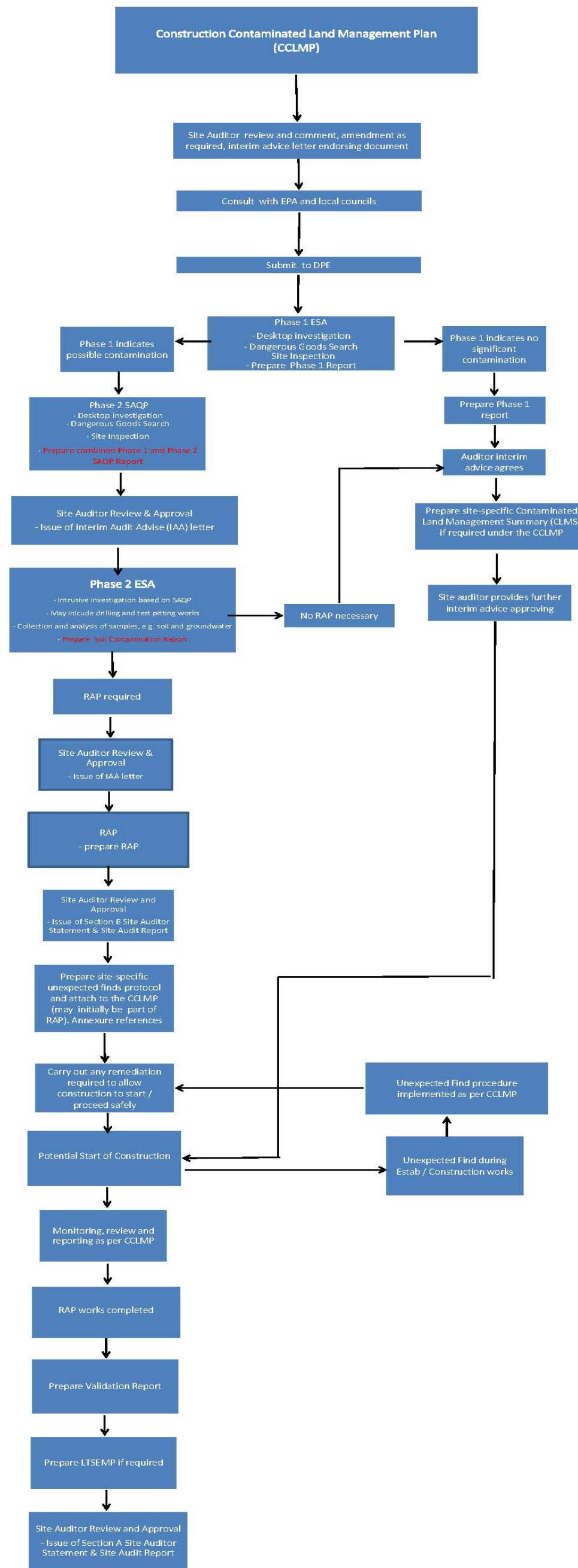
The contamination assessment process for the Project and provision of recommendations for subsequent remediation and/or management will be completed with reference to relevant State and National guidance documents, endorsed under the Contaminated Land Management Act 1997 (the CLM Act), including, but not limited to:

- *Guidelines for the NSW Auditor Scheme (2nd Edition)*, Department of Environment and Conservation NSW (DEC 2006);
- *Guidelines for Consultants Reporting on Contaminated Sites*, Office of Environment and Heritage, (OEH 2011); and
- *National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999*, National Environment Protection Council (NEPC 2013).
- EPA 1995, *Contaminated Sites: Sampling Design Guidelines*. NSW EPA, Sydney.

This approach is consistent with the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project issued during 2015. The SEARs include that the following be completed: "An assessment of contaminated sites in accordance with the guidelines made or approved under section 105 of the Contaminated Land Management Act 1997".

Figure 1 presents the proposed Contamination Assessment and Management Process Flow Chart to be adopted for the Project to achieve the objectives stated in Section 1.2. The steps presented in Figure 1 are described in the following sections. Prior to endorsement for implementation of the CCLMP by the DP&E, CoA D54 requires consultation with local Councils and the NSW EPA on the proposed management strategy. CDS-JV has elected to also seek the independent technical review of the CCLMP by their appointed NSW EPA accredited Site Auditor prior to external stakeholder consultation and review.

Figure 1: Contamination Assessment and Management Process Flow Chart



¹ Assumed to include: City of Sydney Council, Marrickville Council, Rockdale City Council, City of Canterbury Council and Hurstville City Council.

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5.1 Phase 1 ESA

A site specific Phase 1 Environmental Site Assessment (ESA) is required to determine whether potential site contamination poses an actual or potential risk to human health and the environment, either on or off the site, to determine if additional intrusive investigations are required. A thorough understanding of the contaminants of concern would be ascertained, including whether potentially contaminated soil is in an area of cut / fill or is likely to be unsuitable for construction purposes.

The outcomes of the Phase 1 ESA will be presented to the CDS-JV appointed NSW EPA Site Auditor for review. Where no further action is proposed sign-off by the Site Auditor will be sought prior to commencement of works on land identified as potentially contaminated.

5.2 Phase 2 Sampling, Analytical and Quality Plan (SAQP)

If intrusive investigations are deemed necessary a Phase 2 Sampling Analysis and Quality Plan (SAQP) would be prepared, as part of the Phase 1 ESA, to assess the nature and extent of potential contamination for review by the Site Auditor. A soil and/or groundwater SAQP should be developed to inform the Phase 2 ESA in accordance with the NSW EPA (1995) Sampling Design Guidelines or activity specific guidelines.

5.3 Phase 2 ESA

A Phase 2 ESA is required when the results of Phase 1 ESA determine that the site has or is likely to be contaminated based on a review of past land use. Where a Phase 2 ESA is required it will be completed to a level which is sufficient to inform remediation and or management approaches appropriate to the proposed land uses during and post construction. As noted previously the assessment process outlined in the NEPM will be followed when determining whether sites within the Project footprint are contaminated.

A Phase 2 ESA report will be prepared which includes:

- Identification of the type, extent and concentration of contaminants of concern.
- Information on the potential effects of contaminants on public health and the environment.
- Off-site impacts on soil, sediment and biota (where applicable).
- The adequacy and completeness of all information available to be used in making decisions on remediation or site management.
- An assessment of whether the NSW EPA should be notified under s60 of the *CLM Act*.
- Identification of preferred options for remediation and/or site management (i.e. whether the contamination is in an area of cut or fill; preferentially either to be retained in situ, reused within the Project boundary, or disposed off-site).
- If removal of the contaminated material from site is a remediation option, analysis of the material and classification under the *Waste Classification Guidelines Part 1: Classifying waste* (NSW EPA, 2014) and specification that the movement of all potentially contaminated material will be tracked and recorded as per the Construction Waste and Resource Sub Plan (M5N-ES-PLN-PWD-0008)

The Phase 2 ESA report will be presented to the Site Auditor for review. Where necessary, the Phase 2 ESA will include a recommendation for the development of a Remediation Action Plan (RAP). Where a RAP is not deemed necessary, a Contamination Management Summary (CLMS) may be prepared to outline any management actions that are required as a result of the Phase 2 ESA and included in the relevant Construction Area Plan (CAP) and Risk Assessment. The management summary may also be reviewed by the Site Auditor prior to its inclusion in the CAP.

5.4 Remediation Action Plan (RAP)

A Remediation Action Plan (RAP) would be developed to establish the remediation objectives and details the strategy for sites identified as requiring remediation to make them suitable for their intended construction and future land use. The RAP will demonstrate how the risks of contamination will be reduced to within acceptable levels and prevent migration within the site as well as off-site. Where required, RAPs for the Project will:

- Set remediation goals that ensure the remediated site will be suitable for the proposed land use and will pose no unacceptable risk to human health or to the environment;
- Document requirements to be implemented to reduce risks to workers during remediation; and
- Outline sampling requirements to validate that the remediation strategy has been successful.

RAPs will be prepared and submitted to the Site Auditor for review prior to commencement of remediation works.

5.5 Remediation Validation Report (RVR)

A remediation validation report is required to confirm that the remediation goals specified under the RAP have been achieved. The report will detail:

- Description of remedial action undertaken
- The validation results of the remediation action undertaken on the site.
- Confirmation that all regulatory requirements, where applicable, have been met.
- Identification of any residual contamination with discussion of any associated risks and an outline of control measures required.

RVRs will be submitted to the Site Auditor for review and approval. Where residual contamination is retained on-site the RVR may be accompanied by a Long Term Site Environmental Management Plan (LT-SEMP) (Section 5.6).

5.6 Long Term Site Environmental Management Plan (LT-SEMP)

An LT-SEMP may be required to ensure: the environment is protected; site users are not exposed to contamination; and the site is suitable for its intended land use where:

- Complete clean-up of contamination affecting a site is not practicable;
- Contaminants are being capped or contained on-site; and/or
- Remediation is likely to cause a greater adverse impact than would occur if the site were left undisturbed.

An LT-SEMP would ensure activities which could potentially result in exposure of future land users to the residual contaminated soils and/or groundwater beneath the site are precluded or appropriately limited / controlled.

Where required, an LT-SEMP would be prepared to succinctly describe the nature and location of contamination at a site. It would state what the objectives of the plan are, how contaminants are to be managed, who would be responsible for the plan's implementation and over what time frame actions specified in the plan would take place. In addition an LT-SEMP would document the following:

- Administrative controls;
- Program of inspections and maintenance;
- Protocols on intrusive site works;
- Protocols for on-site use and limitations;
- List roles and responsibilities;
- Contact details; and
- Emergency response plan.

The LT-SEMP would be reviewed by the Site Auditor. The Auditor Guidelines (DEC NSW, 2006) also identify several specific requirements to be addressed in the preparation of the LT-SEMP. These include that the implementation of a LT-SEMP must not be specified by a Site Auditor as a condition on a Site Audit Statement, nor accepted by the Auditor as a means of managing contamination of a site, unless the following conditions have been met:

- The LT-SEMP has been reviewed by the Auditor;
- The LT-SEMP can reasonably be made to be legally enforceable, for example because compliance with it is a requirement of a Notice under the *CLM Act* or of development consent conditions issued by the relevant planning authority.

- There will be appropriate public notification of any restrictions applying to the land to ensure that potential purchasers or other interested individuals are aware of the restrictions, for example appropriate notations on a planning certificate issued under Section 149(2) of the *EP&A Act 1979* or a covenant registered on the title to the land under 88B of the *Conveyancing Act 1919*;
- There is no off-site migration of contamination from the site which is the subject of the Site Audit. Where there is off-site migration or its potential, that contamination within the site is managed or monitored so that it does not present an unacceptable risk to either the on-site or off-site environments.

5.7 Site Audit Report (SAR) and Site Audit Statement (SAS)

As required under CoA B31 :“where land is remediated, a final Site Audit Statement(s) must be prepared by an accredited Site Auditor, certifying that the contaminated disturbed areas have been remediated to a standard consistent with the intended land use. The final Site Audit Statement must be submitted to the Secretary and relevant councils prior to operation of the SSI, unless otherwise agreed to by the Secretary.”

The SAS cannot be prepared without completion of the SAR report, which involves the review and consideration of all the steps and associated documents cited under this CCLMP. The outcome of the Site Audit process, i.e. the statement of site suitability on the SAS cannot be pre-empted and requires all the steps under the CCLMP to be completed.

6. Implementation

6.1 Roles and Responsibilities

The roles and responsibilities of key CDS-JV personnel with respect to contamination contaminated land management are detailed in Table 5.

Table 5: CDS-JV Personnel and Responsibilities for Contaminated Land Management

Person	Responsibilities
Project Director	<ul style="list-style-type: none"> Managing the delivery of the New M5 Works including ultimate responsibility for the implementation of contamination land management; and Contractor's Principal Representative.
Support Services Director	<ul style="list-style-type: none"> The environmental responsibilities of the CDS-JV Support Services Director include, but not limited to: <ul style="list-style-type: none"> Provide environmental oversight, direction and leadership regarding the environmental management of the project.
Environment and Sustainability Manager	<ul style="list-style-type: none"> Oversee the implementation of all contamination management strategies; Environmental reporting and monitoring (EPL); NSW EPA liaison; Track and report contamination elements against sustainability targets. Ensure testing of contaminated soil is conducted by a trained and competent person, and a management strategy developed. Ensure contaminated soil is handled, stockpiled, reused and/or disposed of as per the project's contamination management strategy.
Design Manager	<ul style="list-style-type: none"> Ensure relevant contamination management requirements are addressed in design development.
Commercial Director	<ul style="list-style-type: none"> Ensure that relevant contamination management requirements are considered in procuring materials and services.
Construction Director(s)	<ul style="list-style-type: none"> Manage the delivery of the construction process in relation to contamination management across all sites in conjunction with the Environment Manager.
Construction Supervisors and Foremen	<ul style="list-style-type: none"> On-ground implementation and adherence with contamination management requirements. Ensure all movement of contaminated materials is tracked as detailed in the Construction Waste and Resource Sub Plan Ensure water runoff from contaminated land and stockpiles is contained, treated or disposed to ensure there is no pollution of land or waterways. Ensure all vehicles, plant and other machinery that have been in contact with contaminated soil are decontaminated prior to leaving site. Stop work whenever unexpected contaminated materials are discovered or suspected and implement Project or site specific unexpected finds protocol to ensure adequate controls are put in place to undertake the work. Conduct task observations as per Project schedule to ensure ongoing effectiveness of environmental control measures.
Environment Advisors	<ul style="list-style-type: none"> Manage the on-ground application of contamination management measures during construction; and Monitor and report on contamination management during construction.
Project and Site Engineers	<ul style="list-style-type: none"> Implement contamination management activities during construction works. Ensure contaminated land risks are considered as part of the development of Construction Area Plans (CAPs). Ensure Work Packs include relevant environmental control information including a site specific plans prepared under the CCLMP where relevant. Notify the Supervisor and/or Environment Manager/Representative immediately if unexpected contaminated material is suspected or discovered.

Further details on roles and responsibilities are provided in the CEMP.

6.2 Training and Awareness

CDS will ensure that all employees and contractors involved in the Project receive the appropriate training to ensure they understand and are aware of their environmental responsibilities and the measures to be implemented to protect the environment and ensure compliance with statutory approvals.

Training and competency measures for contamination management for the Project will include:

- Ensuring all staff and contractors receive a site-specific induction including contamination procedures;
- Familiarisation with the content of applicable management plans, including the unexpected finds procedure(s), RAPs and/or long-term site environmental management plans;
- Ensuring that all contractors and operators on the site have the appropriate licences, permits to undertake the work;
- Maintaining records of all training, inductions, competencies, licences and permits; and,
- Ensuring that personnel who are required or may be likely to be required to work with contaminated soil understand the key provisions of the POEO (Waste) Regulation as the basis for the waste management procedure under this plan.

Refer to the training requirements in the CEMP Part B Element 7 Training and Competency.

6.3 Consultation

This Plan is being provided to relevant stakeholders, including the NSW EPA and relevant councils (including the City of Sydney Council, Marrickville Council, Rockdale City Council, City of Canterbury Council and Hurstville City Council), as required under CoA D54. It provides detail of how CDS-JV proposes to manage and mitigate potential contamination issues identified in the EIS and raised in the submissions received.

This consultation is intended to assist in development and finalisation of the Plan. Evidence of consultation, including where relevant issues have been addressed within this Plan, will be included in correspondence to DP&E accompanying this plan.

7. Operational Mitigation and Management Actions

7.1 Environmental Plans and Procedures

This Plan refers to the following CDS-JV environmental procedures:

- Manage Soil and Water Procedure (M5N-ES-PRC-PWD-0035)
- Manage Contaminated Land Procedure (M5N-ES-PRC-PWD-0036)
- Manage Work with Asbestos Procedure (M5N-ES-GUI-PWD-0001)
- Manage Acid Sulfate Soils Procedure (M5N-ES-PRC-PWD-0038)
- Manage Hazardous Substances Procedure (M5N-ES-PRC-PWD-0041)
- Manage Waste Procedure (M5N-ES-PRC-PWD-0044).

Other procedures will be developed during project construction as the need arises.

The following plans are integral to the implementation of this Plan:

- Ancillary Sites Management Plan (M5N-ES-PLN-PWD-0026)
- CEMP (M5N-EN-PLN-PWD-0001) and sub-plans including:
 - Construction Soil & Water Quality Sub-Plan (M5N-ES-PLN-PWD-0005); and
 - Waste and Resource Management Plan (M5N-ES-PLN-PWD-0008).

7.2 Mitigation and Management Measures

Measures to manage and minimise the human health and/or environmental impacts associated with disturbance of contaminated land are to be implemented prior to and during works. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. Controls proposed to be used on this Project are identified in Table 6 below.

Construction Contaminated Land Management Plan

Table 6: Project controls associated with disturbance of contaminated land

No.	Management Measures and Mitigation Strategies	Comment	Reference	Reference
CLM01	Project induction and targeted toolbox talks will include discussion of known sites of contamination and the procedure to follow if contamination is suspected.	Construction Area Plan (CAP) will include reference to areas of known or potential contamination (summarised in Appendix B) and will be presented at inductions. Specific information, including details on the procedure(s) to manage the unexpected discovery of contaminated land, will be included in the Project induction. Toolboxes will be held to provide specific information on the management of contaminated soil or groundwater for workers working in the vicinity of known or suspected contaminated sites. Details of additional environmental measures included in RAPs and/or LT-SEMPs will also be tool boxed.	Good Practice	Details of properties identified with a high or medium risk of potential contamination (Appendix B) and associated assessment documents prepared under this Plan Manage Contaminated Land Procedure (M5N-ES-PRC-PWD-0036) RAPs / LT-SEMPs as developed/required
CLM02	Follow the Manage Contaminated Land Procedure (M5N-ES-PRC-PWD-0036) if previously unknown contaminated land, spoil or fill is encountered. Where potentially contaminated material is discovered, notification to relevant Project and agency representatives will be undertaken	Where contaminated material is unexpectedly discovered, works in the vicinity will cease (or modified when it is determined there would be no human health impacts) and the affected area isolated from workers and other persons with a visual barrier that would cause minimal disturbance to the soil (e.g. star pickets with flagging). The Environment Manager shall be notified and works will not recommence until the requirements of the Unexpected Discovery Contamination Procedure (M5N-ES-PRC-PWD-0032) and or the RAP or LT-SEMP are met (including the installation of environmental controls).	CM04 CM10	Manage Contaminated Land Procedure (M5N-ES-PRC-PWD-0036) RAPs / LT-SEMPs as developed/required
CLM03	Areas of known or likely contaminated land will be assessed and managed in accordance with the management process (Section 5) and the requirements of a RAP or LT-SEMP developed for the site as required under the management process.	Prior to working in areas of known or likely contamination, the management process of assessment of contamination and development of appropriate remediation and/or management measures in accordance with legislative requirements and guidelines must be followed. Works on sites of known contamination must be undertaken in accordance with the site specific RAP which will include details of environmental controls for remediation /contamination management works. Work in areas of known contaminated soil should be planned for periods when rain is not anticipated. Cut-off drains, banks or bunds should be provided around excavations to help control the ingress and egress of surface and groundwater, as per the Construction Soil and Water Quality Sub	CM03	This Plan RAPs / LT-SEMPs

Construction Contaminated Land Management Plan



No.	Management Measures and Mitigation Strategies	Comment	Reference	Reference
		Plan (M5N-ES-PLN-PWD-0005) and Site Specific Erosion and Sediment Control Plans. Where it is established that groundwater may be encountered during works on known contaminated sites, dewatering of excavations will be managed in accordance with the requirements of the RAP and EWMS.		
CLM04	As part of the Phase 1 ESA assessment process a dangerous goods search of the Safework NSW records for licenced dangerous goods will be undertaken at each site.	Phase 1 ESA to be prepared under this CCLMP	CM08	Phase 1 ESA to be prepared under this CCLMP
CLM05	Groundwater seepage into excavations will be controlled in accordance with measures identified in Construction Soil and Water Quality Sub Plan (M5N-ES-PLN-PWD-0005). The site assessment completed as part of the Management Process outlined in Section 5 will identify whether groundwater is likely to be encountered during works on known contaminated sites. The RAP developed for known or potentially contaminated sites will include measures for the management of potentially contaminated groundwater, specific to that site and the contaminants of potential concern.	CEMP includes procedures to manage containment, treatment, transfer and / or treatment of groundwater and opportunities for its reuse on-site or disposal off-site. The Manage Soil and Water Procedure (M5N-ES-PRC-PWD-0035) and the Manage Contaminated Land Procedure (M5N-ES-PRC-PWD-0036) identify the process to be followed where potentially contaminated groundwater is encountered. Procedures include monitoring / testing of seepage water collected from the excavations for relevant chemicals of concern prior to on-site treatment and reuse or off-site disposal. Other general groundwater management measures are outlined in CEMP. Where required under the Management Process the RAP will identify the potential for interaction with contaminated groundwater and site specific means for its management.	CSWQSP WQPMP	Phase 2 ESA to be prepared under this CCLMP RAPs as required
CLM06	Where immediate off-site disposal of contaminated material is not possible, the locations proposed for the temporary stockpiling of contaminated material will be managed in accordance with the RAP or	Where stockpiling of contaminated soil is required under a RAP developed for a site: <ul style="list-style-type: none"> • Divert surface run-off away from stockpile sites (including contaminated material stockpiles) • Capture and manage any surface runoff exposed to contaminated land/ material • Locate stockpiles on concrete slabs or polythene or low-density polyethylene sheet (at least two layers of 0.25mm thickness) • Install controls to prevent access by unauthorised personnel. • Cover stockpile with polythene sheets or tarpaulins and anchoring objects (with no sharp edges) to prevent wind blow and potential erosion, where appropriate. • Install straw bales and/or silt fences around the perimeter of the contaminated soil stockpile to maintain separation between contaminated and non-contaminated soil. 	CM12	RAP Construction Waste and Resource Sub-Plan (M5N-ES-PLN-PWD-0008)

Construction Contaminated Land Management Plan



No.	Management Measures and Mitigation Strategies	Comment	Reference	Reference
		Details regarding diversion and capture of surface water will also be included on site-specific erosion and sediment control plans as per the Construction Soil and Water Quality Sub Plan (M5N-ES-PLN-PWD-0005). Where identified as required in an RAP, water testing and management requirements for the stockpile will be undertaken.		
CLM07	Where asbestos is encountered in buildings / structures nominated for demolition, a contractor qualified to handle asbestos will be engaged to undertake its removal prior to demolition.	The approach to managing asbestos waste is identified in Manage Work with Asbestos (M5N-ES-GUI-PWD-0001), which includes the requirement to use a licensed contractor when handling and disposing of asbestos material and certification of the clearance and disposal process.	CM06	Manage Work with Asbestos (M5N-ES-GUI-PWD-0001)
CLM08	Bunding and spill management must be undertaken according to requirements of relevant legislation and Australian Standards and SafeWork NSW requirements and guidelines. Any storage drums or containers containing fuel and chemicals must be contained within covered bunds sufficient to contain at least 120% of the volume of the single largest container stored within the bund.	Bunding will be provided in accordance with Australian Standards.	CM13	Manage Hazardous Substances Procedure (M5N-ES-PRC-PWD-0041)
CLM09	All waste produced as part of the Project must be managed and disposed of in accordance with the Waste Classification Guidelines (NSW EPA 2014) and the Waste Management Procedure under the CEMP	Waste will be classified and managed in accordance with the Waste Classification Guidelines (NSW EPA 2014).	CM05 CM15	Construction Waste and Resource Sub-Plan (M5N-ES-PLN-PWD-0008)
CLM10	A hazardous materials assessment would be carried out prior to and during the demolition of buildings. Demolition works would be undertaken in accordance with the relevant Australian Standards and relevant NSW WorkCover Codes of Practice, including the Work Health and Safety Regulation 2011.	The assessment will be undertaken in accordance with the specific demolition plan.	CM07	Project WHS Management Plan (M5N-HS-PLN-PWD-0001) Manage Work with Asbestos (M5N-ES-GUI-PWD-0001)
CLM11	An Alexandra Canal Contamination Management Plan (ACCMP) will be prepared as a sub-plan to this CCLMP. The ACCMP will outline mitigations measures required to minimise sediment mobilisation as a result of proposed construction activities.	The ACCMP will be prepared by a specialist sediment expert in accordance with the requirements of the Remediation Order under the <i>CLM Act, 1997</i> in consultation with NSW EPA and Sydney Water and City of Sydney Council.	CM11	ACCMP (to be developed following detailed design)
CLM12	Measures to manage public health and safety concerns to be implemented throughout construction in accordance with the Community Communication Strategy.	Where potential off-site impacts (actual or perceived) are identified for contaminated land management activities, the following information to be provided by way of the mechanisms outlined in the Community Communication Strategy: <ul style="list-style-type: none"> Nature of contamination Timing/duration of works affecting contaminated sites 	CoA D54(c)	Community Communication Strategy (M5N-CS-PLN-PWD-0008)

Construction Contaminated Land Management Plan



No.	Management Measures and Mitigation Strategies	Comment	Reference	Reference
		<ul style="list-style-type: none">Construction management and mitigation strategies to ensure health and safety requirements are being met.		

8. Inspection, Monitoring and Reporting

Regular compliance activities, such as inspections, observations and monitoring will be undertaken for the purposes of this CCLMP throughout establishment and construction of the ancillary facilities and construction sites (as described in [Table 4](#)). These activities will focus on the implementation of RAPs and management documents through the Construction Area Plans. Subcontractor works will be included in regular inspections, observations, monitoring and audits as appropriate.

Additional requirements for inspections, monitoring and reporting are included in the relevant RAP, or other site-specific contamination assessment report.



9. Review

9.1 Plan Revision

Plan revisions and performance revisions will be undertaken as per Part B Element 12 of the CEMP.

10. References

ANZECC/ARMCANZ, 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, Canberra.

AECOM 2015, WestConnex New M5 Technical Working Paper: Contamination, AECOM Australia Pty Ltd, November 2015

DEC 2006, Guidelines for the NSW Auditor Scheme (2nd Edition), Department of Environment and Conservation NSW.

DEC 2007, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination. NSW EPA, Sydney.

EPA 1995, Contaminated Sites: Sampling Design Guidelines. NSW EPA, Sydney.

EPA 2014, Waste Classification Guidelines, Part 1: Classifying waste. NSW EPA, Sydney.

NEPC 2013, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999, National Environment Protection Council

OEH 2011, Guidelines for Consultants Reporting on Contaminated Sites, Office of Environment and Heritage.

Construction Contaminated Land Management Plan

Appendix A – Glossary of Terms

Term / Abbreviation	Definition
ACM	Asbestos Containing Material
AFMP	Ancillary Facilities Management Plan
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Procedure (for WCX New M5)
CCS	Community Communication Strategy
CCLMP	Construction Contaminated Land Management Plan
CDS-JV	CPB Dragados Samsung Joint Venture
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act 1997 (NSW)
CoA	Condition of Approval
CoPCs	Contaminants of Potential Concern
Construction Area	A separable portion of work that is identified early in construction planning to help drive early definition of construction methodology and alignment of design activities. Work Areas should be listed in the overall construction methodology. The planning document for a work area is called a Construction Area Plan.
Construction Area Plan (CAP)	The main document prepared during the construction planning for that work area. Includes construction methodology, risk assessment, constructability reviews and Work Pack listing.
CSWQSP	Construction Soil and Water Quality Sub-Plan
CWRSP	Construction Waste and Resource Sub-Plan
D&C	Design and Construction
Deed	As appropriate to the defined scope of the WestConnex New M5 Main Works D&C Deed.
DP&E	Department of Planning and Environment
EC	Environmental Consultant
EIS	Environmental Impact Statement
EMM	Environmental Management Measures
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)

Construction Contaminated Land Management Plan

Term / Abbreviation	Definition
EPL	Environment Protection Licence
ER	Environmental Representative
ESA	Environmental Site Assessment
EWMS	Environmental Work Method Statements
IC	Independent Certifier
Infrastructure Approval	Approval under the Environmental Planning & Assessment Act 1979 for SSI 6788 signed by the Minister for Planning on 20 April 2016
ITS	
LCMP	St Peters Interchange - Landfill Closure Management Plan (M5N-GOL-TER-900-116-0012)
LEMP	Landfill Closure - Landfill Environment Management Plan. An appendix in the St Peters Interchange - Landfill Closure Management Plan
LT-SEMP	Long Term-Site Environmental Management Plan
NEPM	<i>National Environmental Protection (Assessment of Site Contamination) Measure 1999</i>
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Project	WestConnex New M5 Project
Project requirements	The project requirements include all CoA (pursuant to Infrastructure Approval), REMMs, EMMs, SWTC and EPL.
RA	Remediation Area. A discrete section/area for a phase of works as defined in a Remediation Action Plan or Construction Area Plan.
RAP	Remediation Action Plan
REMM	Revised Environmental Management Measure (from the SPIR)
RMS, Roads and Maritime	Roads and Maritime Services
RVR	Remediation Validation Report
SAQP	Sampling Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SEARS	Secretary's Environmental Assessment Requirements
SMC	Sydney Motorway Corporation
SPIR	Submission [and Preferred Infrastructure] Report
SWTC	As appropriate to the defined scope of the Scope of Works & Technical Criteria defined as Schedule XX under the New M5 D&C Deed.

Construction Contaminated Land Management Plan



Term / Abbreviation	Definition
SSI	State Significant Infrastructure
TWA	Trade Waste Agreement
VENM	Virgin Excavated Natural Material
WCX New M5	WestConnex New M5
WDA	WestConnex Delivery Authority, now Sydney Motorway Corporation (SMC)

Construction Contaminated Land Management Plan

Appendix B – Properties preliminary risk evaluation of potential contamination

Area	Address	Figure Reference		Risk of Potential Contamination
		Figure	Site ID	
Kingsgrove North (C1) and South (C2) Construction Compound Site (Kingsgrove)	M5 Linear Park - existing M5 noise mounds on the north and south side of the M5 at Kingsgrove and part of Beverley Grove Park	B1	3	High
	27-31 Garema Circuit, Kingsgrove (SP37275) – commercial / industrial units	B1	23	Medium
Commercial Road (C3) Construction Compound Site (Kingsgrove)	30A and 32 Commercial Road, Kingsgrove – bus parking, warehouse, commercial / industrial (Lots 1 and 2 DP 566805)	B1	24	Medium
Bexley North Construction Compound Site (C4) (Bexley)	RMS vacant land, Bexley Road, Bexley North (Lot 9 to 18 in DP 1069255)	B2	25	Medium
Arncliffe (C7) Construction Compound Site (Arncliffe)	Kogarah Golf Course, 19 Marsh Street, Arncliffe (Lot 1 DP 329283, Lot 1 DP 108492, Lot 14 DP 213314)	B3	4	Medium
Canal Road Compound (C8) (St Peters)	Strata Units - 1 Canal Rd	B4	21	Medium
	Dynamo Workshop - 316 Princes Highway (Lot A DP335583)	B4	21	High
Landfill Closure Compound (C9) (St Peters)	Commercial / Industrial units - 1 Holland Street, St Peters	B4	27	High
	Commercial / Industrial units - 2 Woodley Street and 8A Holland Street, St Peters	B4	26	High
	Commercial / Industrial units - 10-18 Holland Street	B4	28	Medium
Burrows Road Compound (C11) (St Peters)	Dial A Dump Waste, including Good River properties Pty Ltd and SITA Alexandra, 33 Burrows Rd, St Peters	B4	10	High
	Trilogy Smash Repairers, 53-57 Campbell Road St Peters	B4	15	High
Campbell Road Bridge Compound (C12) (St Peters)	Greyhound Bus Depot, 34 Burrows Road, St Peters	B4	8	High
Gardeners Road Bridge Compound (C13) (St Peters)	Trojan Transport Services - 12-18 Burrows Rd, St Peters (Lot 2010 in DP 591060)	B4	19	High
C14 Sydney Park Compound (C14) (St Peters)	Sydney Park, St Peters ((Part of Lot 6 DP810522, Lot 1 DP864698 and Lot 1 DP802167))	B4	6	High
St Peters Interchange Area including bridge and road	The City of Sydney Council Depot, 25-29 Burrows Road, St Peters	B4	5	High
	Sealed Air Australia - Part of 1-3 Burrows Rd, St Peters (Lot 12 in DP 606737)	B4	18	High

Construction Contaminated Land Management Plan

Area	Address	Figure Reference		Risk of Potential Contamination
		Figure	Site ID	
construction (St Peters)	Bradshaw Mountain, Corner of Woodley Street and Campbell Avenue, St Peters (Lot 1 DP88087, Lot B DP376645) ³	B4	22	High
	Former Lead Smelter, 5/5A Canal Rd, St Peters ⁴	B4	2	High
Local Road Upgrades including road construction and widening (St Peters, Alexandria, Mascot)	Boiling Point Pty Ltd, 4-16 Campbell Street, St Peters (Lot 1 DP1010128 and Lot 1 DP321348)	B4	9	High
	Winden Cleaning Products, 62 Campbell Street & 37-39 Albert Street, St Peters	B4	11	Medium
	Builders storage yard, 25 Albert St and 18-20 Campbell Street, St Peters (Lot 1 DP921970, Lot 1 and 2 DP921124 and Lot 1 DP2543)	B4	12	Medium
	Electrical Substation, Albert St, St Peters	B4	13	Medium
	Workshop, 23-25 Campbell Road, St Peters	B4	14	Medium
	Camdenville Park, Bedwin Road and May Street St Peters	B4	7	High
	16/67 Bourke Rd, Alexandria and 81 and 81A Bourke Rd, Alexandria	B4	16	Medium
	Part of 653 Gardeners Road, Mascot	B4	17	Medium
	Goodman property - Part of 697 Gardeners Rd Mascot	B4	20	Medium
	Vacant land and Commercial / Industrial units - 27 to 35 Campbell Road, St Peters	B4	29	Medium
	Food packaging and processing - 47-49 Campbell Road, St Peters	B4	30	Medium
	Thrifty Car Rental – 538 Gardeners Road, Mascot	B4	31	High
	Commercial / Industrial units - 566 Gardeners Road, Mascot	B4	32	Medium
	Commercial / Industrial units - 1-3B, Ricketty Street, St Peters	B4	33	Medium

³ This site is being assessed and remediated in conjunction with the Alexandria Landfill site.

⁴ This site is being assessed and remediated in conjunction with the Alexandria Landfill site.

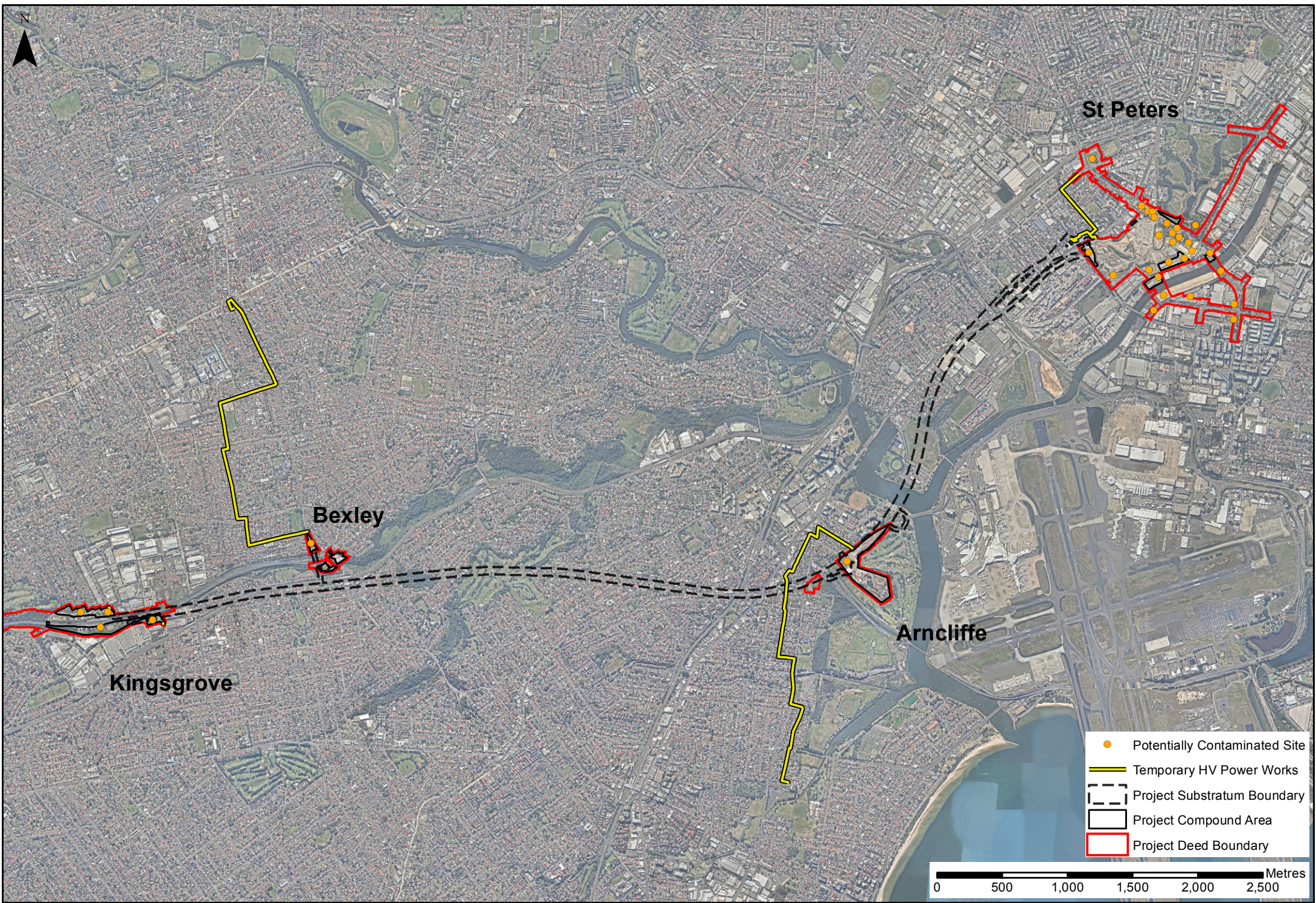


Figure B1: Areas of potential or known contamination- overview

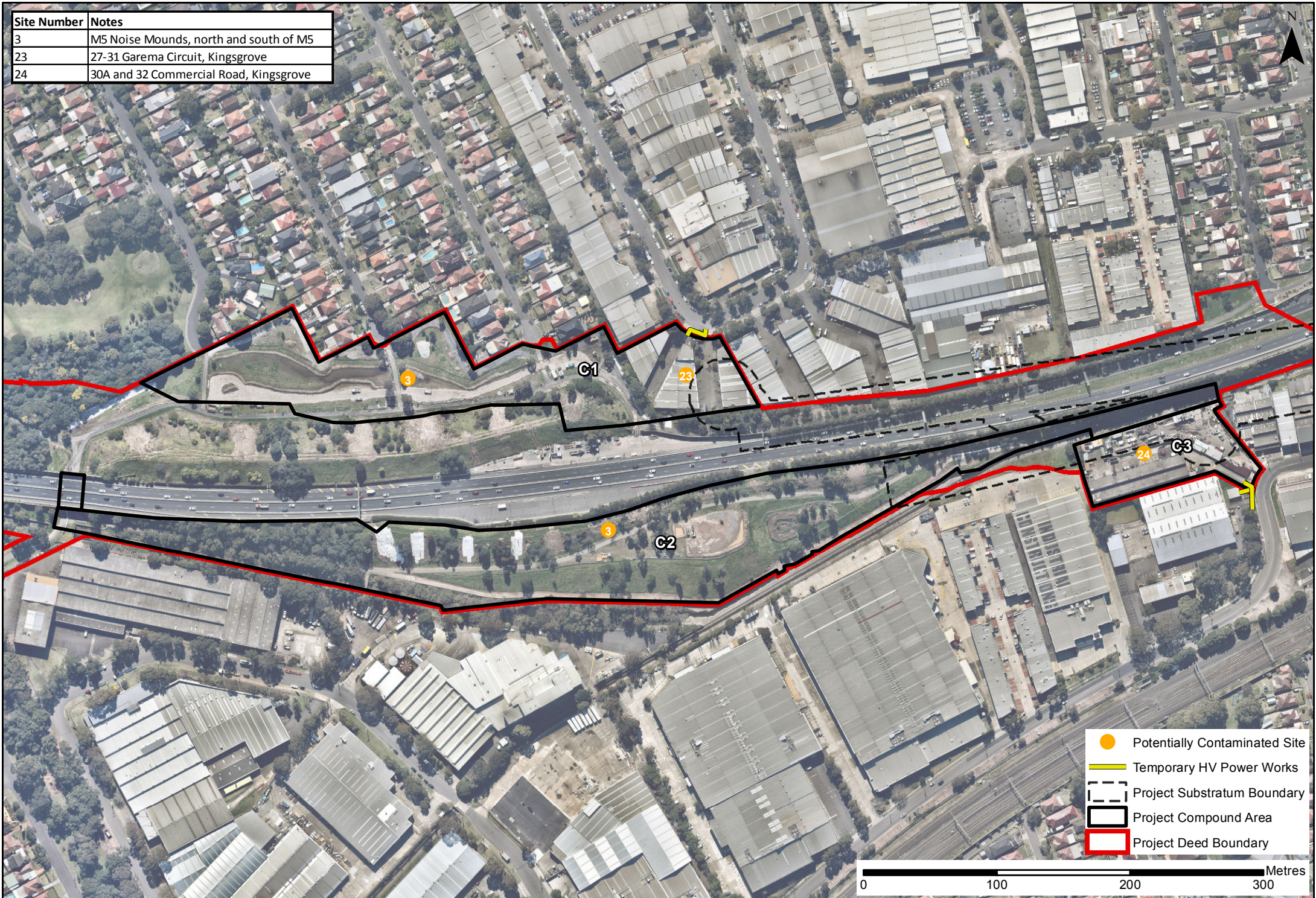


Figure B2: Areas of potential or known contamination- Compounds C1, C2 and C3

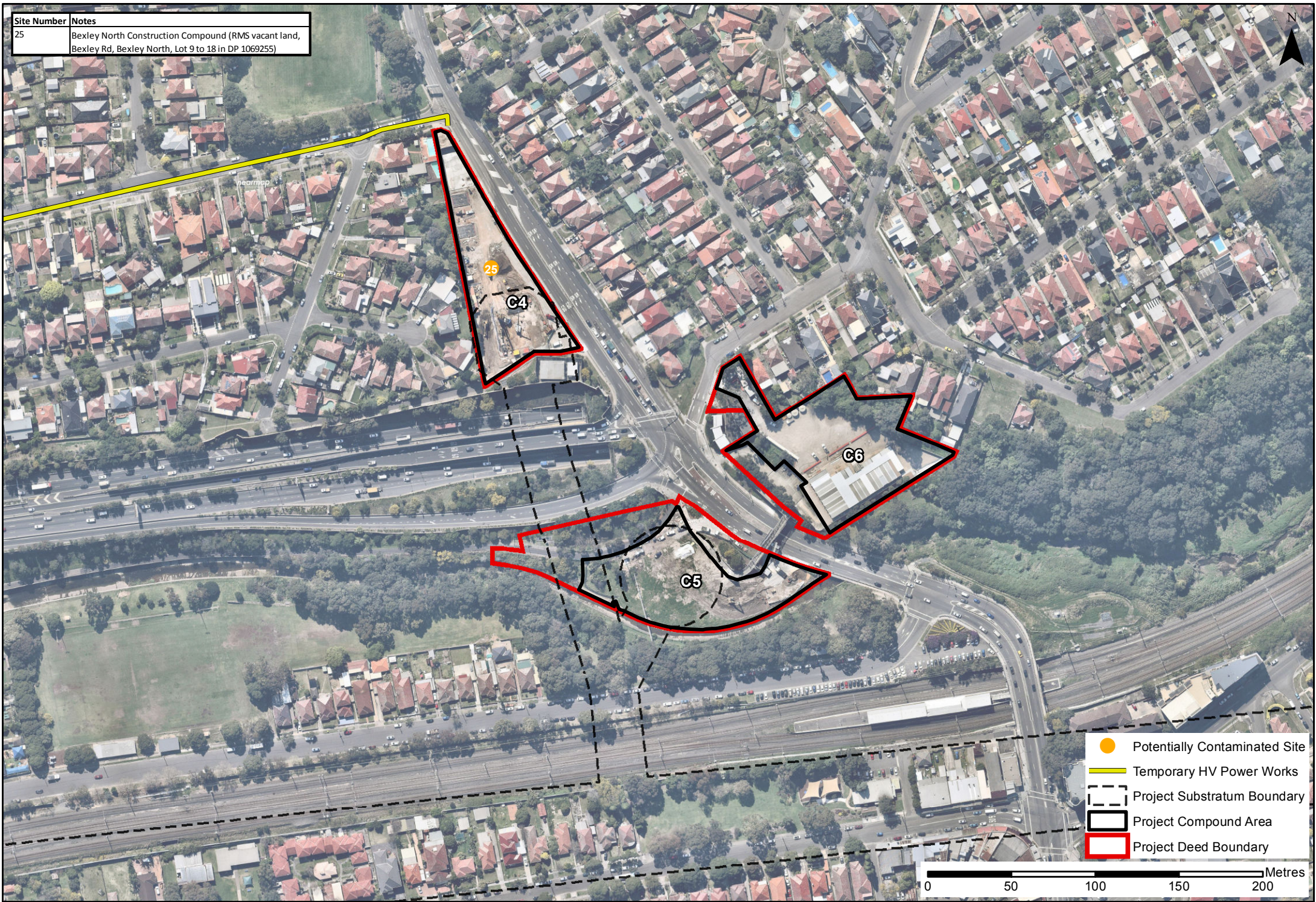
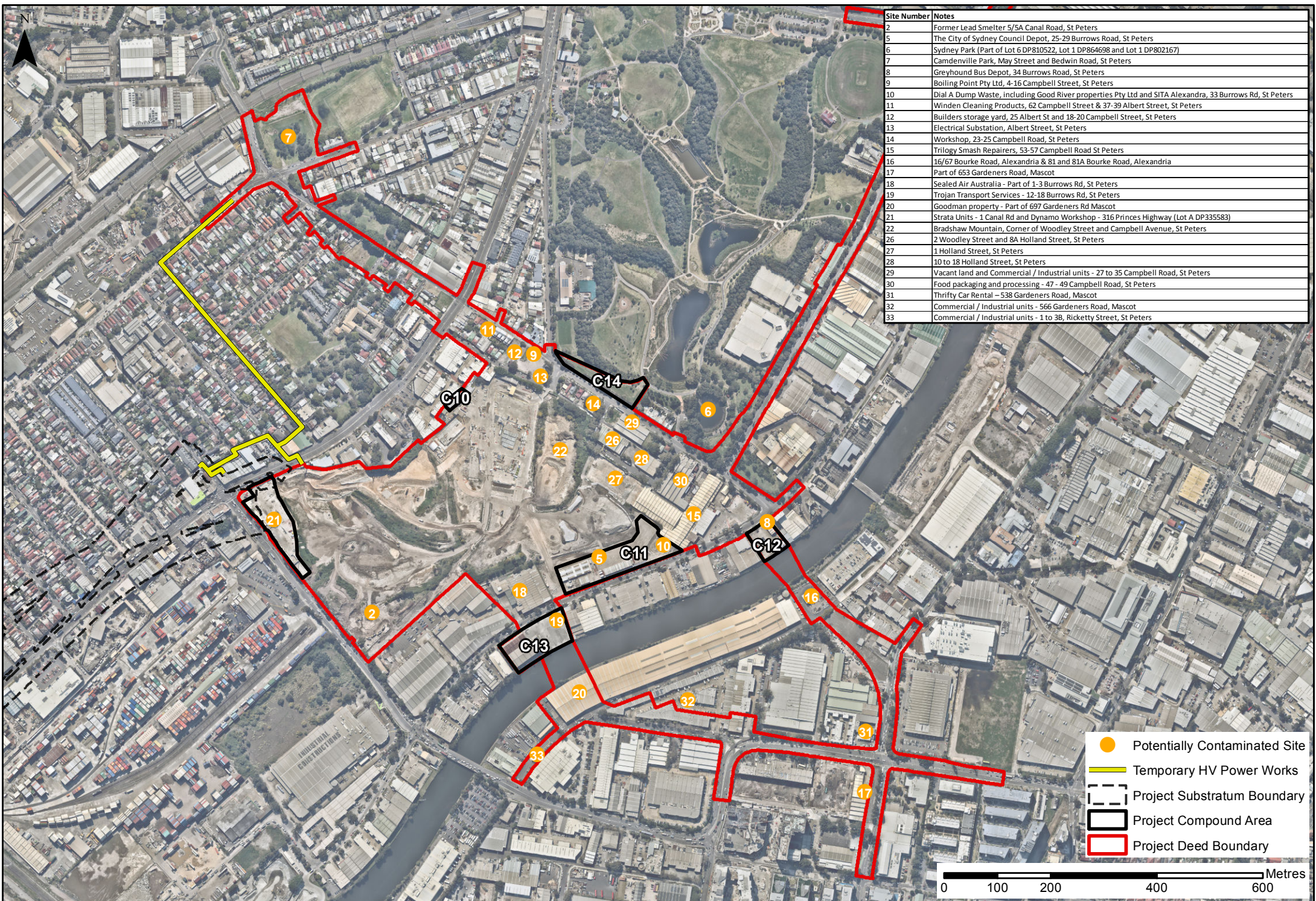


Figure B3: Areas of potential or known contamination- Compounds C4, C5 and C6

Site Number	Notes
4	Arncliffe Construction Compound (part of Kogarah Golf Course, 19 Marsh St, Arncliffe)



Figure B4: Areas of potential or known contamination- Compound C7



Site Number	Notes
2	Former Lead Smelter 5/5A Canal Road, St Peters
5	The City of Sydney Council Depot, 25-29 Burrows Road, St Peters
6	Sydney Park (Part of Lot 6 DP810522, Lot 1 DP864698 and Lot 1 DP802167)
7	Camdenville Park, May Street and Bedwin Road, St Peters
8	Greyhound Bus Depot, 34 Burrows Road, St Peters
9	Boiling Point Pty Ltd, 4-16 Campbell Street, St Peters
10	Dial A Dump Waste, including Good River properties Pty Ltd and SITA Alexandra, 33 Burrows Rd, St Peters
11	Winden Cleaning Products, 62 Campbell Street & 37-39 Albert Street, St Peters
12	Builders storage yard, 25 Albert St and 18-20 Campbell Street, St Peters
13	Electrical Substation, Albert Street, St Peters
14	Workshop, 23-25 Campbell Road, St Peters
15	Trilogy Smash Repairs, 53-57 Campbell Road St Peters
16	16/67 Bourke Road, Alexandria & 81 and 81A Bourke Road, Alexandria
17	Part of 653 Gardeners Road, Mascot
18	Sealed Air Australia - Part of 1-3 Burrows Rd, St Peters
19	Trojan Transport Services - 12-18 Burrows Rd, St Peters
20	Goodman property - Part of 697 Gardeners Rd Mascot
21	Strata Units - 1 Canal Rd and Dynamo Workshop - 316 Princes Highway (Lot A DP335583)
22	Bradshaw Mountain, Corner of Woodley Street and Campbell Avenue, St Peters
26	2 Woodley Street and 8A Holland Street, St Peters
27	1 Holland Street, St Peters
28	10 to 18 Holland Street, St Peters
29	Vacant land and Commercial / Industrial units - 27 to 35 Campbell Road, St Peters
30	Food packaging and processing - 47 - 49 Campbell Road, St Peters
31	Thrifty Car Rental - 538 Gardeners Road, Mascot
32	Commercial / Industrial units - 566 Gardeners Road, Mascot
33	Commercial / Industrial units - 1 to 3B, Ricketty Street, St Peters

Figure B5: Areas of potential or known contamination – SPI and local roads



Appendix C – Alexandra Canal Contamination Management Plan

(this plan is to be developed following detailed design)

Construction Contaminated Land Management Plan

Appendix D – Manage Contaminated Land Procedure



Manage Contaminated Land Procedure

Project Name: WestConnex New M5

Project number:	15.7020.2597
Document number:	M5N-ES-PRC-PWD-0036
Revision date:	06/07/2016
Revision:	01

Document Approval

Rev.	Date	Prepared by	Reviewed by	Recommended by	Approved by	Remarks
00	08/04/16	██████	██████		██████	
01	06/07/16	██████	██████		██████	
Signature:						

Manage Contaminated Land Procedure



Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this Procedure is reviewed and approved. The Support Services Director (SSD) is responsible for updating this procedure to reflect changes to the Project, legal and other requirements, as required.

Amendments

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

Revision Details

Revision	Details
00	Prepared for internal review
01	Unexpected Discovery of Contaminated Land Flowchart updated

Manage Contaminated Land Procedure



Contents

This Manage Contaminated Land Procedure has been produced from CPB Management System documents and project specific information documents. Each of these documents are available individually from the Project Management System and Incite. These documents are presented as one procedure here to support the onsite implementation of these procedures and to facilitate the communication of project specific requirements.

This Manage Contaminated Land Procedure includes:

- Manage Contaminated Land (MSID-2-245)
- Unexpected Discovery of Contaminated Land Flowchart (M5N-ES-FLC-PWD-0001)
- Unexpected Discovery of Contaminated Land Information Document (M5N-ES-INF-PWD-0002)

Manage Contaminated Land

Purpose

This procedure describes how to manage contaminated land. This refers to land that contains substances that are actually or potentially hazardous to health or the environment, often resulting from commercial, industrial and agricultural activities.

Contaminants may include:

- Hydrocarbons
- Polyaromatic hydrocarbons
- PCBs and pesticides
- Heavy metals such as lead, arsenic, cadmium and mercury
- Radioactive waste
- Unexploded ordnance
- Asbestos
- Biologically pathogenic materials and waste.

Procedure

1 Develop and Monitor Contaminated Land Management Strategy

Accountability: Environment Manager/Representative

- Ensure testing of contaminated land is conducted by a trained and competent person, and a management strategy developed.
- Ensure contaminated land is handled, stockpiled, reused and/or disposed of as per the project's contamination management strategy.

2 Include Controls in Construction Area Plan and Work Pack(s)

Accountability: Senior Project Engineer

- Ensure contaminated land risks are considered as part of the development of Construction Area Plans.
 - Refer to Procedure: Develop Construction Area Plan.
- Ensure Work Packs include relevant environmental control information including a Site Environment Plan where required.
 - Refer to Procedure: Develop Work Pack.

3 Undertake Work

Accountability: Supervisor

- Ensure all movement of contaminated materials is tracked using Tool: Materials Tracking Form.
- Ensure water runoff from contaminated land and stockpiles is contained, treated or disposed to ensure there is no pollution of land or waterways.
- Ensure all vehicles, plant and other machinery that have been in contact with contaminated soil are decontaminated prior to leaving site.
- Stop work whenever unexpected contaminated materials are discovered or suspected until adequate controls are put in place to undertake the work.

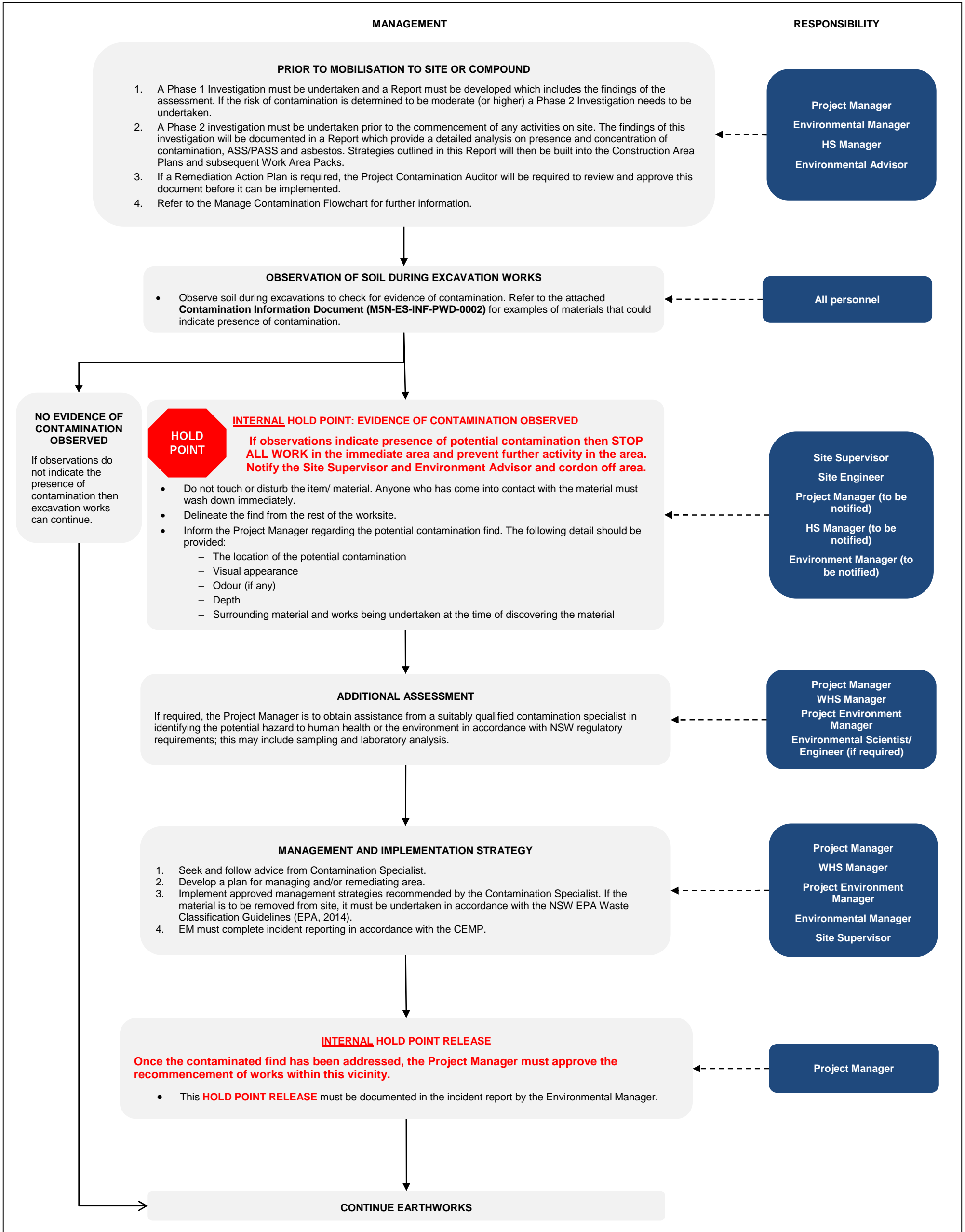
Accountability: Worker

- Notify the Supervisor and/or Environment Manage/Representative immediately if unexpected contaminated material is suspected or discovered.

4 Perform Task Observations

Accountability: Line Manager, SH&E Manager or Subcontractor Supervisor

- Conduct task observations as per Project schedule to ensure ongoing effectiveness of environmental control measures.
 - Refer to Procedure: Conduct Task Observation.



Unexpected Discovery of Contaminated Land Information Document

Nature of Unexpected Contamination

Based upon review of the Environmental Impact Statement for the project (AECOM 2015) the following types of unexpected contamination may be encountered:

Contamination	Information	What to look out for
Uncontrolled fill areas consisting of various materials	<ul style="list-style-type: none"> Materials which could be present include (but not limited to) asbestos, plastic, brick, ceramic, metals fragments. Soils stained by petroleum hydrocarbons, industrial solvents and electrical transformer fluids. The materials listed above may also be found in the groundwater profile. 	<ul style="list-style-type: none"> Asbestos cement fragments or other potentially asbestos containing materials (Figure 1) Odorous or stained soil
Landfill waste that has impacted soils and groundwater	<ul style="list-style-type: none"> This may have created hazards which could include land fill gases such as methane, carbon dioxide, hydrogen sulphide and ammonia; biological wastes; pesticide and chrome arsenate impacted timbers as well as asbestos. Plastic, brick, ceramic, metals fragments are present and soils maybe stained by petroleum hydrocarbons, industrial solvents, electrical transformer fluids and heavy metals. 	<ul style="list-style-type: none"> Odorous material High proportion of waste materials or building debris
Subsurface fuel and lubricant infrastructure	<ul style="list-style-type: none"> Infrastructure could include underground storage tanks and lines. This infrastructure may have impacted the surrounding soils and groundwater. 	<ul style="list-style-type: none"> Buried chemical drums or containers (Figure 2)
Leaking sewerage lines	<ul style="list-style-type: none"> This could have impacted the soil and groundwater profile. Area would be contaminated with faecal coliforms, ammonia, petroleum hydrocarbons, industrial solvents and heavy metals. 	<ul style="list-style-type: none"> Oils and groundwater may smell like sewerage
Service pits and pipes impacted by fuels, lubricants and industrial chemicals	<ul style="list-style-type: none"> These liquid contaminants may have accumulated in pathways and voids. 	<ul style="list-style-type: none"> Tarry or ashy material
Acid sulphate soils (ASS)	<ul style="list-style-type: none"> ASS may be buried under fill or soil. 	<ul style="list-style-type: none"> A yellow and/or red mottling in the soil profile (Figure 3)
Illegal dumping of waste at the construction site	<ul style="list-style-type: none"> This may include building, demolition and general waste. 	<ul style="list-style-type: none"> Brightly or unusually coloured material Various materials (Figure 4)

If unexpected contaminated land is encountered

In the event that unexpected contaminated land is discovered, refer to the Unexpected Discovery of Contaminated Land Flowchart (M5N-ES-FLC-PWD-0001) for guidance.

Personal Protective Equipment

Prior to any contamination investigation / management, appropriate personal protective equipment (PPE) is to be worn as per the relevant Safety Data Sheet(s) (SDS) and/or Work Method Statement (WMS).

This may include, but not be limited to:

- Eye goggles;
- Face mask;
- Rubber boots;
- Rubber gloves; and
- Work clothes (i.e. long sleeve shirt/pants and steel capped boots).

For instance where high risk environments are encountered for investigation (e.g. confined spaces, noxious gases, generation of air borne asbestos) a multitude of PPE would apply (e.g. facial masks, respirators, full body protective suites, etc).

In all cases, the selected PPE should be relevant to the investigation and contaminant/s and worn in a manner that adheres to manufacturer's instructions and follow relevant safety protocols for use).

Acid Sulfate Soils (ASS)

ASS are naturally occurring soils, sediments or organic substrates that are formed under waterlogged conditions in coastal areas. When exposed to air after being disturbed, soils containing iron sulfides produce sulfuric acid and often release toxic quantities of iron, aluminum and heavy metals. If these are encountered, carry out activities in accordance with the Unexpected Discovery of Contaminated Land Flowchart (M5N-ES-FLC-PWD-0001) and refer to the CPB Manage Acid Sulfate Soil Procedure (MSID-2-241) for further information and guidance.



Figure 1 Excavated asbestos and building material



Figure 3 Acid Sulfate Soil

Asbestos

If Asbestos is encountered, carry out activities in accordance with the Unexpected Discovery of Contaminated Land Flowchart (M5N-ES-FLC-PWD-0001) and refer to the CPB Manage Work with Asbestos Procedure (MSID-2-332) for further information and guidance.

Record Keeping

Record keeping associated with the Manage Contaminated Land procedure includes:

- Contamination Testing Results;
- Contamination Validation Report other Contamination Specialist reports (as applicable); and
- Waste Disposal Records (as applicable).



Figure 2 Discovery of buried chemical container



Figure 4 Contaminated excavated material