

CONSTRUCTION AIR QUALITY MANAGEMENT PLAN

Moorebank Precinct West Stage 1

01 DECEMBER 2020

SYDNEY INTERMODAL TERMINAL ALLIANCE

Moorebank Precinct West Stage 1

Construction Air Quality Management Plan

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KEY TERMS AND ACRONYMS

Acronym/Term	Definition
ACM	Asbestos containing material
ALARP	Mitigate risk to “As Low As Reasonably Practicable”;
ARCP	Asbestos Removal Control Plan
AWS	Automatic Weather Station
CEMP	Construction Environmental Management Plan
CoC	Conditions of Consent
Code of Practice	A practical guide to achieve the standards of health and safety required under the model Work Health and Safety (WHS) Act and model WHS Regulations
EIS	Environmental Impact Statement titled Environmental Impact Statement titled <i>Moorebank Intermodal Terminal Project Environmental Impact Statement</i> , prepared by Parsons Brinckerhoff Australia Pty Limited, dated October 2014.
Environmental Aspect	means the interaction, relationship or impact of an operation or activity with the Environment including
Environmental Law	relating to the storage, handling or transportation of waste, dangerous goods or hazardous material relating to Workplace health and safety; or which has as one of its purposes or effects the protection of the Environment
Environmental Notice	means any direction, order, demand, license or other requirement from a Government Agency to take action or refrain from taking any action in respect of the Site or the Works in connection with any Environmental Law
EPA	Environmental Protection Authority
HESQ	Health Environment Safety Quality
IMT	Intermodal Terminal Site
MPW Main Compound	MPW Early Works (Stage 1) compound relocated in accordance with RfMA 002 to meet future MPW Stage 2 requirements
MPW Stage 1	Moorebank Precinct West Stage 1 – Early Works as approved under SSD 5066
SSD 5066	Means State Significant Development number 5066 – Concept Approval and Early Works Approval for MPW (MPW Stage 1)
Non-compliance	An occurrence, set of circumstances, or development that results in a non-compliance or is non-compliant with Development Consent SSD 5066 Conditions of Consent or EPBC Act Approval or EPBC Act Approval (EPBC 2011/6086) Conditions of Approval but is not an incident
Non-conformance	Observations or actions that are not in strict accordance with the CEMP and the aspect specific subplan
OEH	Office of Environment and Heritage

Acronym/Term	Definition
Project Approval	The Written Approval from the Minister for Planning
RAP	Remediation Action Plan
REMM	Review of Environmental Mitigating Measures
SIMTA	Sydney Intermodal Terminal Alliance
Site	Means the project site or work area where the Contractor is undertaking activities on behalf of SIMTA
Standards	Standards are published documents setting out specifications and procedure
The Contractor	The company, companies or other legal entity appointed by SIMTA to undertake works under the Project Approval
The Secretary	The Secretary of the Department of Planning & Environment
UXO	Unexploded ordnance
VOC	Volatile Organic Compound

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REQUIREMENT MATRIX

Minister's Conditions of Consent

Table 1 Minister's Conditions of Consent

CoA No	Condition Requirement	Document Reference
D21 (e)	Construction Air Quality Management Plan to detail how impacts on local air quality will be minimise and managed. The Plan shall be developed in consultation with the EPA, and shall include, but not necessarily be limited to:	This Plan
(i)	identification of sources (including stockpiles and open work areas) and quantification of airborne pollutants;	Section 4, Figure 1, Figure 5, Figure 6
(ii)	key performance indicators for local air quality during construction	Section 7, Table 8
(iii)	details of monitoring methods, including location, frequency and duration of monitoring	Section 7, Table 7
(iv)	mitigation measures to minimise impacts on local air quality;	Section 5, Table 5, Table 6, Table 10
(v)	procedures for record keeping and reporting against key performance indicators;	Section 7, Table 8
(vi)	provisions for implementation of additional mitigation measures in response to issues identified during monitoring and reporting; and	Section 5, Section 6.2, Table 10
(vii)	mechanisms for the monitoring, review and amendment of this plan	Section 1.2

REMM REQUIREMENTS

Table 2 - REMM Requirements

No.	Mitigation Measure	Document Reference
10A	A Dust Management Plan (DMP) (or equivalent) would be prepared as part of the CEMP.	This Plan
10B	Dust minimisation measures would be developed and implemented before commencement of construction. The NSW Coal Mining Benchmarking Study: Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (OEI 2011) would be considered.	Section 5
10C	Methods for management of emissions would be incorporated into Project inductions, training and pre-start talks.	Section 6.2
10D	Activities with the potential to cause significant emissions, such as material delivery and load out and bulk earthworks, would be identified in the CEMP. Work practices that minimise emissions during these activities would be investigated and applied where reasonable and feasible.	Section 5
10E	A mechanism for raising and responding to complaints would be put in place for the duration of the construction phase.	Section 7.6

No.	Mitigation Measure	Document Reference
10F	Vehicle movements would be limited to designated entries and exits, haulage routes and parking areas. Project site exits would be fitted with hardstand material, rumble grids or other appropriate measures to limit the amount of material transported offsite (where required).	Section 5
10G	Work site compounds and exposed areas would be screened to assist in capturing airborne particles and reduce potential entrainment of particles from areas susceptible to wind erosion	Section 5
10H	<p>Dust would be visually monitored during construction and the following measures would be implemented where necessary: Apply water (or alternative measures) to exposed surfaces that are causing dust generation. Surfaces may include any stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas). Regular watering would ensure that the soil is moist to achieve 50% control of dust emissions from scrapers, graders and dozers.</p> <p>Appropriately cover loads on trucks transporting material to and from the construction site. Securely fix tailgates of road transport trucks before loading and immediately after unloading to prevent, where possible, or remove, mud and dirt being tracked onto sealed road.</p> <p>Apply water at a rate of >2 litres (L) per square metre per hour (L/m²/hr) to internal unsealed access roadways and work areas. Application rates would be related to atmospheric conditions (e.g. prolonged dry periods) and the intensity of construction operations. Paved roads should be regularly swept and watered when necessary.</p>	Section 5
10I	Where reasonable and feasible, dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions.	Section 5
10J	Project site speed limits of 20 km/h would be imposed on all construction vehicles travelling within the Project site	Section 5
10K	Graders would be limited to a speed of 8 km/h to reduce potential dust emissions	Section 5
10L	Material stockpiles would not exceed an area of 1 ha and would be regularly watered to achieve 50% control of potential dust emissions	Section 5
10M	Exposed areas and stockpiles would be limited in area and duration. For example, vegetation stripping or grading would be staged where possible, unconsolidated stockpiles would be covered, or hydro mulch or other revegetation applicant applied to stockpiles or surfaces left standing for extended periods	Section 5
10N	Revegetation or rehabilitation activities would proceed once construction activities were completed within a disturbed area.	Section 5
10O	Construction plant and equipment would be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards	Section 7.5
10P	Excavation works in potentially contaminated soils should be managed to ensure that they are completed during optimal dispersive conditions to minimise odorous emissions.	Section 5

No.	Mitigation Measure	Document Reference
10Q	Emissions from trucks would be regulated in accordance with the requirements prescribed in the National Environmental Protection Measure (NEPM) (Diesel Vehicle Emissions) (NEPC 2001) or suitably relevant standards	Section 5
10R	All construction vehicles would be tuned to avoid releasing excessive smoke from the exhaust and would be compliant with OEH Smokey Vehicles Program under the NSW <i>Protection of the Environment and Operations Act 1997</i> (POEO Act) and <i>POEO Regulations</i> (NSW) (2010).	Section 5
10S	All on-road trucks are to comply with the Euro V emission standards or suitably relevant standards	Section 5
10T	All new off-road construction equipment would be required to meet, at minimum, the US Environmental Protection Agency (EPA) Tier 3 emission standards (or suitably relevant standards) for non-road diesel engines.	Section 5
10U	Establishment of Action Response Levels (ARLs) for use with realtime dust management. These aid in the assessment of impact potential, and establish an early warning system during adverse trends, reducing complaint potential, non-compliance and non-conformance issues. An ARL trigger would be a defined measurement of elevated dust levels for a prolonged period	Section 7

1 INTRODUCTION

1.1 Purpose

This Construction Air Quality Management Plan (CAQMP) has been prepared for the 'Early Works' (Stage 1), demolition and remediation at the Moorebank IMT site.

It has been developed to ensure a high standard of care to minimise the impact on the environment, immediate work sites, and the local community.

This CAQMP addresses the applicable requirements of:

- The conditions of Project Approval (SSD 5066) issued by the Minister of Planning on the 3rd of June 2016 (CoC);
- The Moorebank Intermodal Terminal – Supplementary Responses to Submissions Report
- Review of Environmental Mitigation Measures - 12 August 2015;
- Applicable New South Wales and Australian Environmental Legislation;
- Commonwealth Approval (No 2011/6086), under the Environmental Protection Biodiversity Conservation Act 1999 (EPBC).

This CAQMP is to be read in conjunction with the Construction and Environmental Management Plan (CEMP).

1.2 Revision Changes of this CAQMP

Revisions and improvements will be consistent with Section 1.5 of the CEMP.

1.3 Distribution List

A controlled copy of this CAQMP is to be distributed to the following parties for comment and review.

- The Contractor(s) Directors, Senior Management, Project Manager, Environmental Manager/Advisor, Project Engineer and Site Supervisors;
- SIMTA Project Managers and Superintendent;
- NSW EPA.

Following review, it will be submitted to the Minister for Planning to assess if the Conditions of Approval have been met.

Once the CAQMP has been approved, a hardcopy will be kept onsite and updated as required by the Project Environmental Manager, as well as a controlled PDF version being uploaded into the Moorebank LPWDR Aconex 'cloud'. All Contractors and Subcontractors will be provided a copy to ensure their works are consistent with this CAQMP.

1.4 Consultation

Consultation with the Environmental Protection Authority (EPA) as per CoA D21(e), was commenced in the final week of September 2016, and involved the CAQMP being forwarded to the EPA.

Following a number of follow up calls and emails as detailed in Table 11 of Appendix A, on the 7th of October 2016, the Environmental Officer from the EPA assigned to the review, replied by email stating that the EPA did not intend to review the details of this CAQMP at this stage, however noted that a review by the EPA may be undertaken at the request of the Department of Planning and Environment during their review.

2 LEGAL AND OTHER REQUIREMENTS

2.1 Legislation

Legislation relevant to air quality management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act);
- Protection of the Environment Operations (Clean Air) Regulation 2010; and
- National Greenhouse and Energy Reporting Act 2007;
- Protection of the Environment Operations (Waste) Regulation 2014;
- National Environment Protection (Ambient Air Quality) Measure 2003 (NSW);
- National Environment Protection (Diesel Vehicle Emissions) Measure 2009 (NSW).

2.2 Guidelines and Standards

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

- National Environment Protection Council's (NEPC) – National Environment Protection Measure (NEPM) for Ambient Air Quality;
- AS 3580.1.1:2007 Methods for sampling and analysis of ambient air: Part 1.1: Guide to siting air monitoring equipment;
- AS 3580.10.1:2003 Methods for sampling and analysis of ambient air: Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method;
- AS/NZS 3580.12.1:2001 Methods for sampling and analysis of ambient air - Determination of light scattering - Integrating Nephelometer method;
- Action for Air (NSW EPA, 1998);
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (Department of Environment and Conservation NSW (DEC), 2005);
- Code of Practice: How to Safely Remove Asbestos;
- NSW Coal Mining Benchmarking Study: Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (OEH 2011).

2.3 Background

This CAQMP addresses the MPW Stage 1 related to the construction of the Moorebank Intermodal Terminal (MIT). This stage will involve the establishment of construction site facilities; site security; utility services identification, protection, relocation and termination; heritage salvage and relocation works; demolition of existing infrastructure and buildings; and remediation of identified contamination in order to provide unencumbered access for the next works package.

2.4 Project Overview

The Moorebank Intermodal Terminal is located in Moorebank, NSW. The Site is located in Liverpool Local Government Area, approximately 30 km south-west of the Sydney CBD and 4km south of the Liverpool CBD. It sits along the Georges River, immediately west of Moorebank Avenue and south of the M5.

Construction Air Quality Management Plan



Figure 1 Site Layout

2.5 General Description of Site

The site is located immediately east of Georges River at an approximate ground level height of 15 metres above Australian Height Datum. It was formally used by Department of Defence (Defence), including the School of Military Engineering (SME) and other minor Moorebank units, as follows:

The northern portion of the site known as 'Moorebank Barracks' is predominantly comprised of areas of open space interspersed with heavy vegetation. Land use within Moorebank Barracks appears to consist of administration and older accommodation buildings, a warehouse structure believed to be utilised for the storage and maintenance of vehicles and a concrete lined surface water drainage culvert, which runs east to west across the area and flows towards the Georges River;

The southern portion of the site known as 'Steele Barracks', housed the Royal Australian Engineers (RAE) SME and was the regional headquarters of the NSW Brigade of the Australian Army Cadets and the RAE Museum and RAE Golf Club. Steel Barracks land was predominantly used for accommodation, administration offices, engineering workshops, sports ovals and military training areas including a parade ground, bomb detection and disposal compounds, a small arms range, firefighting training areas, a large bulk earth movement training area (known as the 'dustbowl'), a bridging yard and a dog training compound.

The site forms part of the Cumberland Plain Woodland of western Sydney. While much of the site's flora and fauna has been disturbed, it still contains Castlereagh Swamp Woodlands, Castlereagh Scribbly Gum Woodland, Riparian Forest and Alluvial Woodland. There are a number of sites of Aboriginal significance, including three mature scarred trees, primarily located in the riparian zone on the western boundary. The remainder of the site has been extensively developed for defence purposes, with a number of low-rise buildings, parade grounds, and sporting ground. The site is subject to low or no flood hazard.

2.6 General Scope of Work

This scope of work is for the demolition and remediation works associated with the Moorebank Intermodal Terminal project, in order to provide unencumbered access for the next land preparation works package. It includes the following:

- Establishment of construction site facilities and management of site security;
- Utility services and stormwater identification, termination and removal
- Heritage salvage and relocation works;
- Demolition of existing infrastructure and buildings;
- Remediation of identified contaminated areas excluding PFAS.

2.7 Overall Program

Table 3 Early Works Overall Program

Activity	2016		2017				2018				2019			
	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Establishment of construction site facilities and management of site security	X	X	X	X										
Utility services and stormwater identification, removal and backfill	X	X	X	X	X	X	X	X	X	X	X	X		
Heritage salvage and relocation works	X	X	X	X	X	X								
Demolition of existing infrastructure and buildings			X	X	X	X								
Remediation of identified contaminated areas ¹			X	X	X	X	X	X	X	X	X	X		
MPW Main Compound construction											X	X		
PFAS affected catchment capping and lining											X	X		
Level make good and handover,				X	X	X	X	X	X	X	X	X		
'Care-taker' period												X	X	

¹ Excludes areas containing endangered ecological communities (EEC)

3 EXISTING ENVIRONMENT

3.1 Meteorological Conditions

The annual wind distribution pattern for the (Office of Environment and Heritage) OEH Liverpool monitoring station, approximately 10km away, shows that the prevailing wind direction is from the west-south-west, with south-westerly and westerly winds also occurring frequently as shown in Figure 2 and Figure 3.

These winds dominate during the autumn, winter and spring. Airflow from the east and south-east is more prevalent during summer. A smaller percentage of winds originate from all other directions, with the lowest frequency of winds originating from the north-eastern quadrant. The wind field affects the direction of transport and rate of dilution of air pollutants. Given the prevalence of west-south-westerly, westerly and south-westerly airflow and the greater frequency of higher wind speeds associated with these sectors, there is a greater potential for wind dependent emissions from the Project to have an impact to the north and east of construction activities.

The Project site is located approximately 25 km inland with relatively flat topography, at a location affected by temperature inversions.

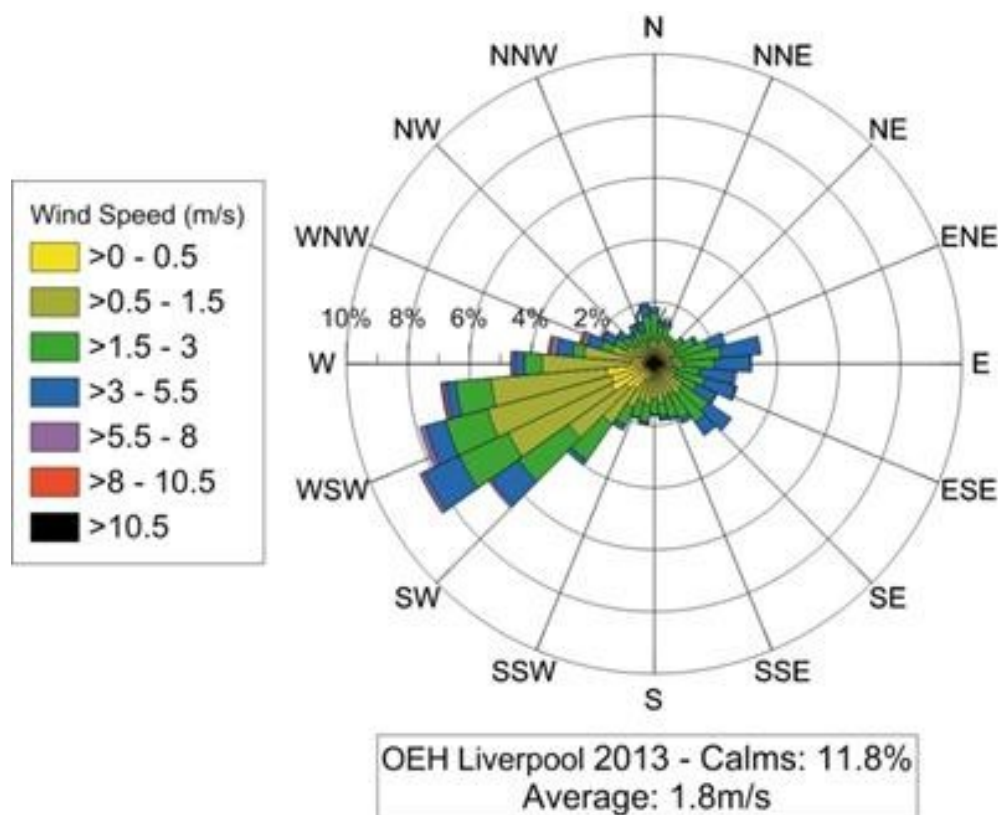


Figure 2 Annual Wind rose OEH Liverpool Station 2013

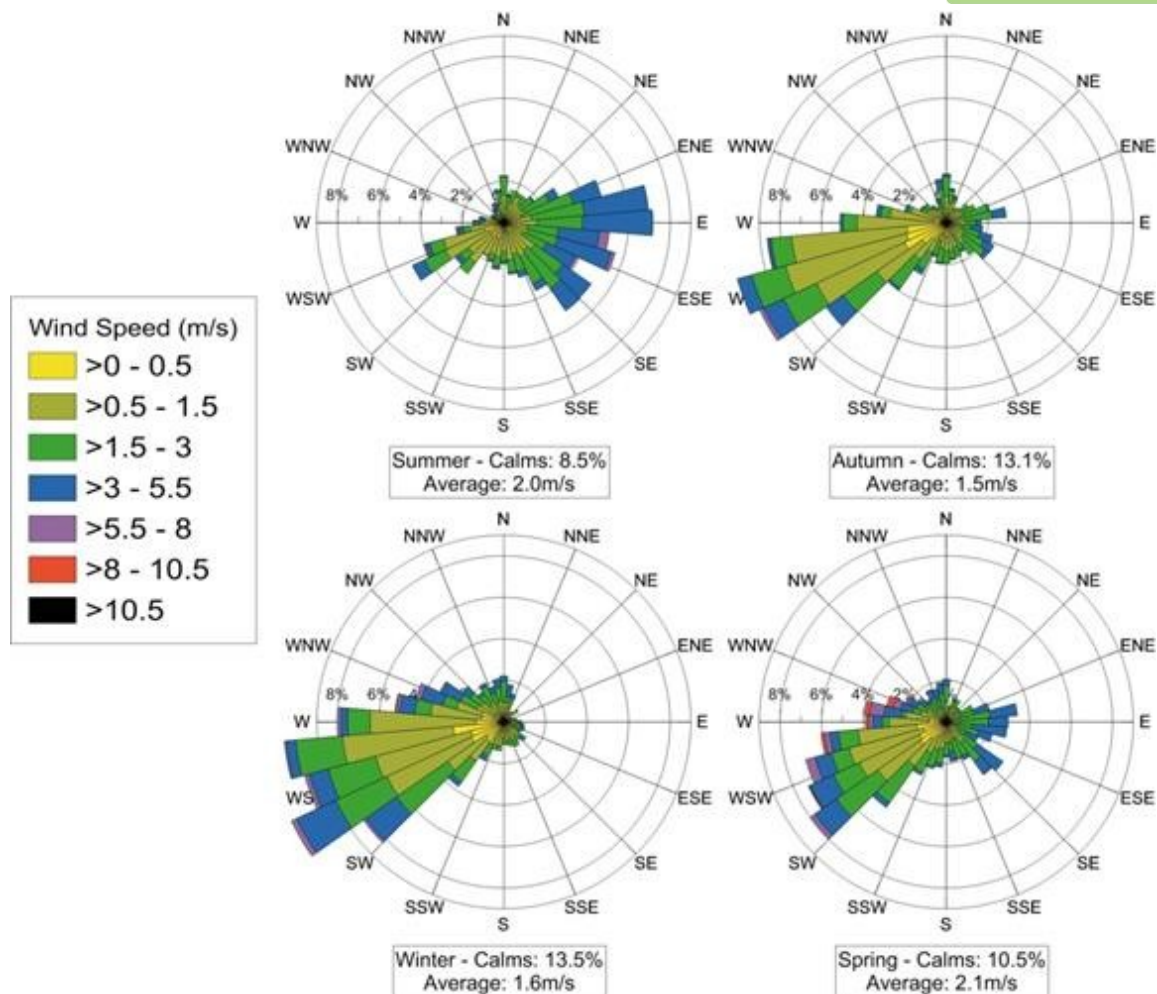


Figure 3 Seasonal Wind rose - OEH Liverpool Station 2013

3.2 Rainfall

Rainfall reduces dust generation potential and helps to remove airborne pollutants. The wettest months generally occur during late summer and early autumn. The wettest month is usually February, with an average rainfall of 106 mm. The lowest rainfall usually occurs in September with a monthly average of 45 mm. The long-term average annual rainfall experienced at the Bankstown Airport Automatic Weather Station (AWS), is 896 mm, which falls over an average of 115 days over the course of the year.

3.3 Temperature

The maximum monthly average temperatures at the Bankstown Airport AWS range between 17.1°C in winter to 28.2°C in summer. Monthly average minimum temperatures range between 5.1°C in winter and 18.1°C in summer.

3.4 Existing Air Quality and Pollutant Sources

A number of existing industrial and non-industrial sources have the potential to influence local and regional air quality. Sources include emissions from major industries, the Glenfield Landfill, commercial operations and road and rail traffic. Key emissions likely to be generated by these sources include dust or particulate matter, fine particles, nitrogen dioxide, sulphur dioxide, carbon monoxide, trace levels of volatile organic compounds, heavy metals and odour.

Ambient air quality monitoring equipment was established at the Project site in July 2012 and data from NSW EPA stations at Liverpool and Chullora has also been referenced in the Environmental Impact Statement (EIS). Air quality monitoring has identified that the concentrations of these pollutants are generally within regulatory guidelines (OEH criteria); however, over recent years, limited and rare exceedances have been recorded in concentrations of particulate matter and fine particles during bushfire and dust storm events.

3.5 Soil Characteristics

The soil landscape on the Project site consists of Quaternary and Tertiary terraces of the Nepean River and the Georges River. The soils comprise of structured orange to red clay loams, clays and sands with the potential for the presence of ironstone nodules.

This variation in soils means water required and frequency of application to reduce dust emissions will vary dependant on the soil type and hence will require monitoring during the works.

Soils are saturated at depths of between 7 m and 15 m below AHD. Existing fill material onsite includes sands, gravels, clays, as well as building demolition materials such as concrete, bricks, metals and plastic.

Due to past and current land use activities, notably those of Defence, site surveys have identified a number of existing sources of potential water and land contamination. Existing contamination includes residual contamination from the detonation of explosives used in military training operations, buried wastes from onsite demolition and development activities, leaks from stored/used hazardous chemicals and fuels, and asbestos-containing materials.

PFAS contamination has been identified in a number of locations on site as part of investigations associated with Early Works development.

PFAS investigations have been undertaken across the MPW site in association with the following:

- Post-Phase Two Environmental Site Assessment (Golder, 2015)
- Validation Plan – Principles (Golder, 2015a)
- Remediation Action Plan² (RAP)
- PFAS Management Plan (CARAS, 2018)
- PFAS Stormwater Management Strategy (EP Risk, 2018a)
- Qualitative Human Health Risk Assessment (EP Risk, 2018b).

The PFAS contaminated areas outlined within these plans will be remediated in accordance with the RAP (Golder, 2016) and the PFAS Management Plan (CARAS, 2018).

² Golder (2016): Moorebank Intermodal Company Property West – Land Preparation Works Stage 1 and Stage 2 – Remediation Action Plan, 9 August 2016.

3.6 Sensitive Receivers

Sensitive receivers are defined as locations where people are likely to work or reside, and may include dwellings, schools, hospitals, offices or public recreational areas (NSW Department of Environment and Conservation (DEC) 2005). Many such sensitive receivers accommodate groups who are most likely to be adversely affected by poor air quality; the very young, the aged and the infirm. Sensitive receivers for the project were identified in the EIS and shown below in Figure 4.

For this stage of works, works will occur well within the site boundaries and as shown in Figure 1, and a comparison with Figure 4 shows a substantial buffer distance are present to these sensitive receivers.

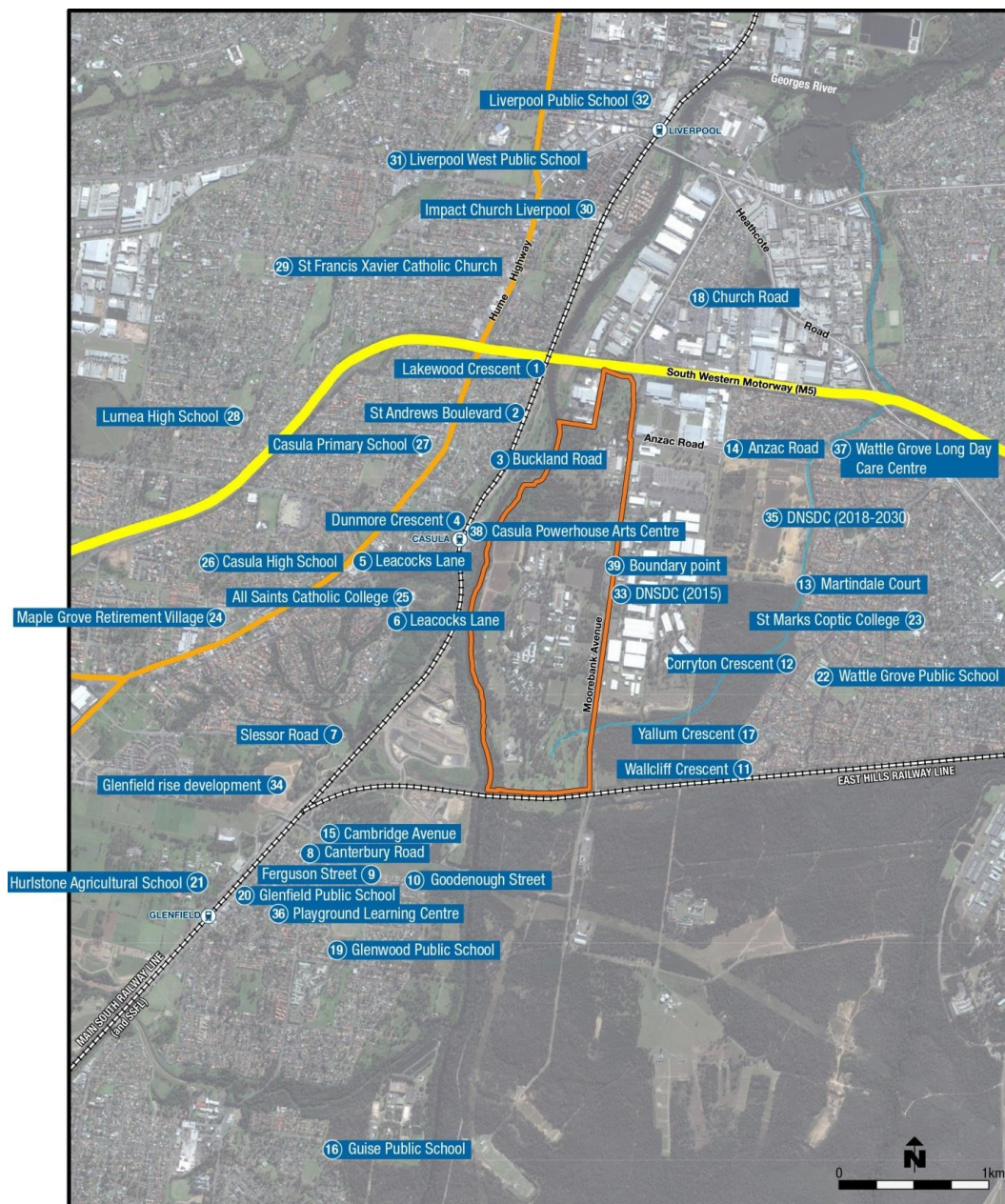


Figure 4 Nearest Sensitive Receivers

4 ENVIRONMENTAL ASPECTS AND IMPACTS

As identified in the *Section 5.4 – of the EIS Air Quality*, during the Early Works given the magnitude of the earthworks and short-term nature of construction, the air quality impacts are considered negligible and as such a pollutant quantity analysis in this CQAMP has not been undertaken.

Nevertheless, a risk management approach was used to determine the severity and likelihood of the early works activities' impact on air quality and to prioritise its significance in order to further reduce the impacts. This process considered potential regulatory and legal risks as well the concerns of the community and other key stakeholders.

4.1 Potential Sources of Air Emissions

The Early Works Footprint as shown in Figure 1 minimises the area required to complete the Early Works; this reduces the impact on Endangered Ecological Communities (EEC). Works are to be undertaken in all areas of the Early Works footprint as shown in Figure 1, however, the locations which have the potential to have the greatest impact on air quality have been identified as:

- The demolition of existing structures and hardstand (Figure 5)
- Remediation activities due to the potential for release of possibility of volatiles and odours (Figure 6)
- Stockpile sites (Figure 1)

The location of these work areas are shown in Figures 5 and 6.

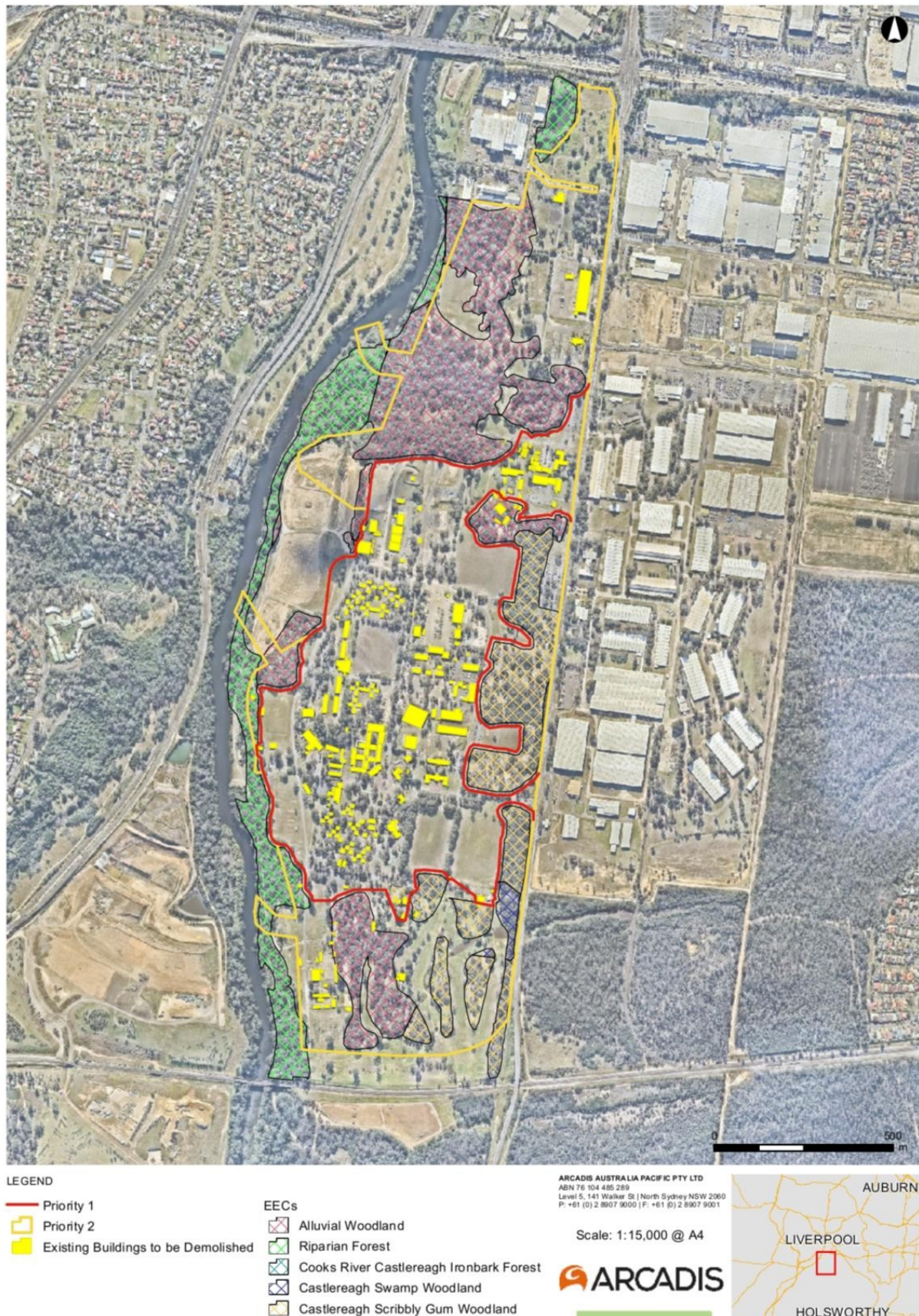


Figure 5 Location of Demolition Work Areas



Figure 6 Location of Remediation Work Areas

The table below details the activities which have the potential to cause air emissions, and their potential impacts.

Table 4 - Potential Sources of Air Emissions

Activity	Air Emission Cause	Potential Impact
Utility services and stormwater identification, protection, relocation and/or termination	Excavation of Utilities	Dust Generation
	Operation of Plant, Machinery and Vehicles	Vehicle Emissions
Heritage salvage and relocation works	Excavation of Sub Surface Artefacts	Dust Generation
	Operation of Plant, Machinery and Vehicles	Vehicle Emissions
Demolition of existing infrastructure and buildings	Demolition of buildings using large excavators, through induced collapse and deconstruction techniques	Dust Generation
	Sorting of demolition waste using excavators	
	Loading of Demolition Waste for transport using excavators and loading equipment	
	Removal of Concrete Building Slabs and roads with excavators and breaking equipment	Vehicle Emissions
	Operation of Plant, Machinery and Vehicles	
	Removal of Asbestos from buildings to be demolished	
Remediation of identified contaminated areas	Excavation of remediation hotspots with large excavators	Dust Generation (from both excavation and stockpiling of material)
	Sorting of waste using excavators	
	Loading contaminated soils for transport using excavators	
	Stockpiling contaminated soils	
	Treatment of Contaminated soils using plant and machinery	Vehicle Emissions
	Operation of Plant, Machinery and Vehicles	
	Excavation and Biological Treatment of contaminated soils which exhibit Volatiles/ Odour Emissions, such as those contaminated with hydrocarbon products.	

Activity	Air Emission Cause	Potential Impact
	Excavation of Asbestos Containing Soils for offsite disposal or for transport to treatment areas for removal of asbestos fragments through hand picking	Potential Asbestos Fibre Release (from the excavation of and remediation of asbestos containing soils)
Establishment of construction site facilities and management of site security	Compound site preparation (clearing and levelling)	Dust Generation
	Fill importation, stockpiling and placement	
	Reshaping and stabilization works	
	Establishment of erosion and sediment controls and utilities	
	Road works	
	Operation of plant, machinery and vehicles	Vehicle emissions

5 ENVIRONMENTAL MITIGATION MEASURES

Methods for management of emissions would be incorporated into Project inductions, training toolboxes and pre-start talks. Mitigation measures for the project are discussed below in Table 5 and Table 6.

These mitigation measures are designed to be absolute measures, that is produce no dust or odours and therefore additional implementation measures will not be required for the project.

5.1 Truck and Equipment Movements

Table 5 - Truck and Equipment Mitigation Measures

Reference No.	Action	Responsibility	Timing
AQ1	Vehicles will only travel on designated roads onsite to the maximum extent possible. The speed will be limited onsite to 20km/hr and when backfilling, graders would be limited to 8km/h. This is imposed onsite by the site supervisors and reiterated during the site inductions.	Contractor Site Supervisor Contractor Environment Manager/Advisor	Project Duration
AQ2	Vehicle movements would be limited to designated entries and exits, haulage routes and parking areas. The location of these will be detailed in the site induction. Project site exits would be fitted with hardstand material, rumble grids or other appropriate measures to limit the amount of material transported offsite (where required);	Contractor Site Supervisor	Project Duration
AQ3	Applying water (or alternative measures) to exposed surfaces that are causing dust generation. Apply an adequate amount of water to internal sealed and unsealed access roadways to mitigate wheel generated dust and to work areas so they do not generate dust.	Contractor Site Supervisor	When Required
AQ4	Application rates would also be related to atmospheric conditions (e.g. prolonged dry periods) and the intensity of construction operations. Paved roads will be regularly swept and watered when necessary;	Contractor Site Supervisor	Project Duration
AQ5	Loads will be appropriately covered on trucks transporting material to and from the construction site. Tailgates will be fixed on road transport trucks before loading and immediately after unloading;	Contractor Site Supervisor	Project Duration
AQ6	Prevent, where possible, or remove, mud and dirt being tracked onto a sealed road by not working in or traversing muddy or boggy areas	Contractor Site Supervisor	When Required
AQ7	Emissions from trucks would be regulated in accordance with the requirements prescribed in the National Environmental Protection Measure (NEPM) (Diesel Vehicle Emissions) (NEPC 2001) or suitably relevant standards and will occur by trucks being regularly serviced by the Contractor's mechanics in line with these standards, with service records kept onsite.	Contractor Project Manager Contractor Environment Manager/Advisor	Project Duration

Reference No.	Action	Responsibility	Timing
AQ8	All new off-road construction equipment would be required to meet, at minimum, the US Environmental Protection Agency (EPA) Tier 3 emission standards (or suitably relevant standards) for non-road diesel engines and will be facilitated by the Contractor.	Contractor Project Manager Contractor Environment Manager/Advisor	When Purchasing new equipment
AQ9	All trucks transporting asbestos containing soil offsite will be covered by an 'Envirotarp (or similar) and all general asbestos waste leaving site will be contained by double lining with 200µm thick plastic and regulated by the Protection of the Environment Operations (Waste) Regulation 2014 Act.	Contractor Site Supervisor	Project Duration
AQ10	All on-road trucks are to comply with the Euro V emission standards or suitably relevant standards and will occur by trucks being regularly serviced by the Contractor's mechanics in line with these standards, with service records kept onsite.	Contractor Project Manager	Project Duration
AQ11	Daily visual dust inspections will be undertaken	Contractor Site Supervisor	Project Duration
AQ12	Dust deposition gauges will be placed around the main compound construction (as per Figure 7) area to measure dust emissions generated by works	Contractor Site Supervisor	Project Duration

5.2 Services, Remediation, Heritage and Demolition Activities

Table 6 - Services, Remediation, Heritage and Demolition Mitigation Measures

Reference No.	Action	Responsibility	Timing
AQ13	Demolition activities when generating dust above the trigger levels as discussed in Section 7 will use water or misting sprays;	Contractor Site Supervisor	When Required
AQ14	Exposed areas and stockpiles would be limited in area and duration. For example, vegetation stripping or grading would be staged where possible, unconsolidated stockpiles would be covered, or hydro mulch or other revegetation applicant applied to stockpiles or surfaces left standing for extended periods;	Contractor Site Supervisor Contractor Environment Manager/Advisor	Project Duration
AQ15	Odours and dust from stockpiles and excavations will be managed using a combination of wetting down, vapour	Contractor Site Supervisor Contractor Environment Manager/Advisor	Project Duration and When Required

Reference No.	Action	Responsibility	Timing
	suppressants, polymer application or the use of covers		
AQ16	Where reasonable and feasible, dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions	Contractor Site Supervisor Contractor Environment Manager/Advisor	When Required
AQ17	Material stockpiles would not exceed an area of 1 ha and would be regularly watered to achieve 50% control of potential dust emissions	Contractor Site Supervisor Contractor Environment Manager/Advisor	Project Duration and When Required
AQ18	Revegetation or rehabilitation activities would proceed once construction activities were completed within a disturbed area	Contractor Project Manager Contractor Site Supervisor Contractor Environment Manager/Advisor	Project Duration
AQ19	<p>Asbestos removal within building will be in accordance with relevant Legislation and Code of Practices, and hence asbestos fibres will not be released at elevated levels requiring additional mitigation measures.</p> <p>General asbestos waste will be placed directly into bags or double wrapped in 200µm thick plastic for disposal and not stockpiled. During asbestos soil remediation works, soils will be kept sufficiently wet to ensure no dust occurs. If soils are placed in stockpiles prior to treatment they will be kept wet and/or covered. Asbestos management will be undertaken in accordance with the Asbestos Removal Control Plan and Asbestos in Soils Management Plan.</p>	Contractor Site Supervisor Contractor Asbestos Supervisor	Project Duration
AQ20	During bioremediation activities, as bacterial degrade hydrocarbons and/or soil ameliorants, the potential for moderate odour being generated exist. The mitigation measures for this include monitoring of bioremediation stockpiles, using minimal addition of soil ameliorants or using low odour products.	Site Supervisor Contractor Environment Manager/Advisor	Project Duration
AQ21	Dust affecting site compounds will be managed by the erecting of screening (if required)	Contractor Site Supervisor	Project Duration



6 COMPLIANCE MANAGEMENT

6.1 Roles and Responsibilities

The roles and responsibilities are outlined in Section 5.2.3 of the CEMP. Specific responsibilities for the implementation of the environmental controls are detailed in Table 5, Table 6 and Table 7 of this CAQMP.

6.2 Training

All workers and visitors shall undergo the following inductions/trainings prior to commencing work:

- Project Specific Induction
- Air Emission Awareness training. This will outline the mitigation measures as described in Tables 5 and 6 of this plan to ensure that site staff are aware of the requirements and their individual responsibilities for air quality management
- Flora and Fauna Awareness;
- Aboriginal and European Heritage Awareness;
- Stormwater and Spills Awareness;
- Unexploded Ordnance (UXO) Induction

All personnel, including employees, contractors and sub-contractors, are required to complete a project induction containing relevant environmental information before they are authorised to work on the project. Air quality specific information to be covered in toolbox talks and in pre- work meetings will include:

- Obligations under the project Conditions of Consent (including the CAQMP), including the identification of potential sources of air pollutants of concern and the mitigation measures to be implemented, including measures;
- Responsibilities pertaining to the management of air quality under the Protection of the Environment Operations Act 1997 and Protection of the Environment Operations (Clean Air) Regulation 2010;
- Typical activities that may impact air quality and associated environmental safeguards; and
- Incident response procedures

Records of all training activities, including inductions, will be maintained. Records will include the name and role of the attendee, the name of the course and, where applicable, reference to the document-controlled version of the material presented, and a copy of the assessment completed.

Additional or revised training shall be consistent with Section 7.4 of the CEMP.

6.3 Non-compliance, Non-conformance and Actions

It is the responsibility of all site personnel to report non-compliances and non-conformances to the Site Supervisor and/or the Contractor's EM.

Non-compliances, non-conformances and corrective and preventative actions will be managed in accordance with Section 10.3 of the CEMP and Section 7.7 of this document.

7 MONITORING

Below is a summary table for the air monitoring details. Monitoring details and discussion on records of monitoring are located in Section 9.2 of the CEMP. KPI for the project with regards to air quality have been developed and are located in Table 8 Air Quality KPIs. All results from daily inspections will be kept by the Environment Manager/Advisor onsite.

Table 7 - Air Monitoring Details Summary

Monitoring Focus	Monitoring Details	Area	Responsibility	Frequency
Weather	Meteorological Data including daily rainfall, temperature, relative humidity, wind (direction and speed)	All	Contractor Environment Manager	Daily
Dust	Visual observation during daily site inspections, and by supervisors as works progress	All	Contractor Environment Manager (Daily) Contractor Site Supervisors (During Works)	Daily and during works
	Dust deposition gauges placed around site	All	Contractor Site Supervisors (During Works)	During works
Volatiles and Odour	Odour observations during daily site inspections, and by supervisors as works progress	Remediation Work Areas	Contractor Environment Manager (Daily and as requested) Contractor Site Supervisors (During Works) Environmental Consultant (As requested)	Daily and during works
Asbestos	Asbestos Air Monitoring	Asbestos Removal Areas	Contractor Asbestos Supervisors Contractor Environment Manager	Daily as Results are published
Plant	Daily Plant Inspection	NA	Plant Operators	Daily

Table 8 - Air Quality KPI

Air Quality Indicator	KPI	Recording
Dust	No Visible dust leaving the boundaries	Work Permit Weekly Environmental Audit
	No Complaints received over the duration of the project	Complaints Database
Odour/Volatiles	All non-detectable odour at boundary	Work Permit Weekly Environmental Audit
	No Complaints received over the duration of the project	Complaints Database
Asbestos	All monitoring results for the project below a fibre count of 0.01 f/ml	Asbestos Air Monitoring Register
Plant	No Excessive Smoke	Daily Plant Inspections
	All Plant Maintained as Per Manufactures Specification	Plant Maintenance Records

7.1 Weather

Weather can have a large impact on Air Quality. As wind speeds increase and with higher temperatures, there exists a greater potential that dust and volatiles will be generated.

Weather reporting will be based on Bureau of Meteorology (BoM) information and reported in pre-start meeting or as conditions change broadcast over site radio.

7.2 Dust

The performance indicator for dust will be no visible dust leaving the site boundaries and/or no visible dust being generated that has the potential to affect the workers onsite.

Daily visual dust inspections will be undertaken by the Site Supervisor; the Site Supervisor will deploy water carts regularly to ensure that there is no visible dust leaving the site boundaries and/or no visible dust is being generated that has the potential to affect the workers onsite. Monthly monitoring of dust production will be carried out through the use of dust gauges, with a target of less than 4g/m²/month. Any exceedances of either of these criteria would trigger a response as outlined in Section 5.

7.3 Volatiles and Odour

The classification of odour by levels shall be described as non-detectable, low, moderate or strong as determined by the Environmental Consultant and Contractor Environmental Manager using olfactory methods. As the strength of volatilisation of contaminants is proportional to the strength of odour for the contaminants identified in the Remediation Action Plan (RAP), this is an effective and common method used in industry to assess' volatilisation of these contaminants.

Other nuisance odours such as those produced in biodegradation of contaminants shall be also be monitored this way. The performance indicator for odour will be, non-detectable odour at the site boundary and/or no odours greater than moderate or strong being present onsite that have the potential to affect workers. Exceedance of this indicator would trigger the response as outlined in Section 5.

While we do not anticipate there will be odour issues based on the data provided in Remediation Action Plan (RAP), during excavation and stockpiling, treatment of soil, there exists the potential to discover an

unexpected find. Should this occur the unexpected finds protocol as outlined in the CEMP will be followed and responses as outlined in Appendix A3 will be implemented.

7.4 Asbestos and Air Monitoring

Asbestos air monitoring will occur in accordance with regulatory requirements, where the removal area will be monitored continuously for asbestos fibres. The results of the air monitoring will be provided to the relevant internal stakeholders.

Once the results of the air monitoring are received, the licenced asbestos removalist must take action depending on the respirable fibre level. Where the results show that respirable asbestos fibre levels exceed the action levels outlined in the below table, action must be taken immediately

Table 9 - Action Levels for Asbestos Air Monitoring

Action Level	Control	Action
Less than 0.01 fibres/ml	No new control measures are necessary	Continue with control measures
At 0.01 fibres/ml or more than 0.01 fibres/ml but less than or equal to 0.02 fibres/ml	1. Review	Review control measures
	2. Investigate	Investigate the cause
	3. Implement	Implement controls to eliminate or minimise exposure and prevent further release
More than 0.02 fibres/ml	1. Stop removal work	Stop removal work
	2. Notify regulator	Notify the relevant regulator by phone followed by fax or written statement that work has ceased and the results of the air monitoring
	3. Investigate the cause	Conduct a thorough visual inspection of the enclosure (if used) and associated equipment in consultation with all workers involved with the removal work

7.5 Plant

Pre-start Construction plant inspections will be conducted to ensure equipment is well maintained and serviced so that vehicular emissions remain within relevant air quality guidelines and standards. Equipment observed to be creating excessive emissions will be replaced or serviced.

7.6 Complaints Management

As per CEMP Section 8.

7.7 Corrective Action

Once KPI's are not adhered to corrective action measures will be implemented as detailed in the Table 10 on the following page.

Plant and materials used in vapour and dust suppression techniques will be kept on standby to be used as required.

Table 10 - KPI Corrective Action Table

Air Quality indicator	KPI	Corrective Action	Corrective Action Timeframe
Dust	No Visible dust leaving the boundaries	Apply dust suppression techniques (i.e. water; use of covers; stabilisation of stockpiles)	As soon as non-conformance is received
	No Complaints received over the duration of the project	Once Complaint is received, conduct investigation	As outlined in Section 8 of the CEMP
Odour/volatiles	All non-detectable odour at boundary	Apply Vapour Suppression Techniques (i.e. vapour suppression chemicals; use of covers)	As soon as non-conformance is received
Asbestos	All monitoring results for the project below a fibre count of 0.01 f/ml	Cease works and review asbestos control measures	As soon as monitoring result is received
Plant	No Excessive Smoke	Cease using plant and consult mechanic. Remove from service until issue is resolved	As soon as non-conformance is received
	All Plant Maintained as Per Manufactures Specification	Remove plant from service until issue is resolved	As soon as non-conformance is received

APPENDIX A EXTERNAL CONSULTATION

Table 11 - Summary of External Consultation with the EPA

Agency	Position Contacted	Action Date	Outcome or Notes
Environmental Protection Authority (EPA)	Environmental Officer	26/09/2016	CAQMP delivered to EPA offices at 59-61 Goulburn St, Sydney NSW 2000
		27/09/2016	Environmental Officer assigned to the project was phoned no answer was received and message left
		27/09/2016	Environmental Officer returned phone and advised they would review plans
		6/10/2016	Environmental Officer assigned was phoned no answer was received and message was left
		7/10/2016	Environmental Officer replied by email stating that the EPA did not intended to review the details of this CAQMP at this stage, however noted that a review by the EPA may be undertaken at the request of the Department of Planning and Environment during their Review