CONSTRUCTION AIR QUALITY MANAGEMENT PLAN

Moorebank Precinct West Stage 2

02 APRIL 2020

SYDNEY INTERMODAL TERMINAL ALLIANCE MOOREBANK PRECINCT WEST STAGE 2

Construction Air Quality Management Plan

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[redacted] BSc (Hons), HDip, MSc	[redacted] has 18 years of professional experience, with the last 13 years as a specialist in air quality management. His areas of expertise include dispersion modelling, emission estimation, odour assessment and monitoring.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
A	21/09/2018	First draft for client review	[redacted]	
B	12/10/2018	Updated to reflect client comments		
C	12/12/2018	Updated to address ER comments		
D	9/10/2019	Updated to reflect Recommended Conditions of Consent		

Revision	Date	Description	Prepared by	Approved by
E	29/11/2019	Updated to reflect Final Conditions of Consent	[redacted]	
F	02/04/2020	Updated to address DAWE comments		

KEY TERMS AND ACRONYMS

Acronym/Term	Meaning
AAQ NEPM	National Environment Protection (Ambient Air Quality) Measure
AQIA	Air Quality Impact Assessment
ARL	Action response levels
CAQMP	Construction Air Quality Management Plan
CBD	Central Business District
CCS	Community Communication Strategy
CEMP	Construction Environmental Management Plan
CLM	Construction Liaison Manager
CM	Construction Manager
CoC	Conditions of Consent
CSpMP	Construction Spoil Management Plan
DAWE	Department of Agriculture, Water and Environment (formerly DotEE (Department of the Environment and Energy))
DIPNR	NSW Department of Infrastructure, Planning and Natural Resources (disamalgamated in 2005)
DPIE	NSW Department of Planning, Industry and Environment (formerly the Department of Planning and Environment)
EIS	Environmental Impact Statement
EM	Environmental Manager
EMS	Environmental Management System
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EWMS	Environmental Work Method Statements
Goals	Assessment criteria for dust outlined in CoC B46, being 2g/m^2/month or maximum of 4g/m^2/month at the closest offsite sensitive receiver
ha	hectare
IMT	Intermodal Terminal
km	kilometres

Acronym/Term	Meaning
L	litres
MAUW	Moorebank Avenue Upgrade Works
MPE	Moorebank Precinct East
MPW	Moorebank Precinct West
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
NO_2	Nitrogen dioxide
O_3	Ozone
OEH	Office of Environment and Heritage
OSD	On-site detention
PM	Particulate matter
PM_{10}	Particulate matter with aerodynamic diameter of 10 microns or less
$PM_{2.5}$	Particulate matter with aerodynamic diameter of 2.5 microns or less
POEO Act	*Protection of the Environment and Operations Act 1997*
Principal's Representative	The Project Management Team and Environmental Specialists
RCMM	Revised Compilation of Mitigation Measures
REMM	Revised Environmental Management Measures
RSoC	Revised Statement of Commitments
RtS	Response to Submissions
SIMTA	Sydney Intermodal Terminal Alliance
SSD	State Significant Development
SSFL	Southern Sydney Freight Line
the Project	Stage 2 of the MPW Concept Approval (SSD 5066) approved as the MPW Stage 2 Project (SSD 16-7099), involves the construction and operation of an intermodal terminal (IMT), warehousing and distribution facilities, freight village and upgrades to the Moorebank Avenue and Anzac Road intersection.
TSP	Total suspended particulate matter

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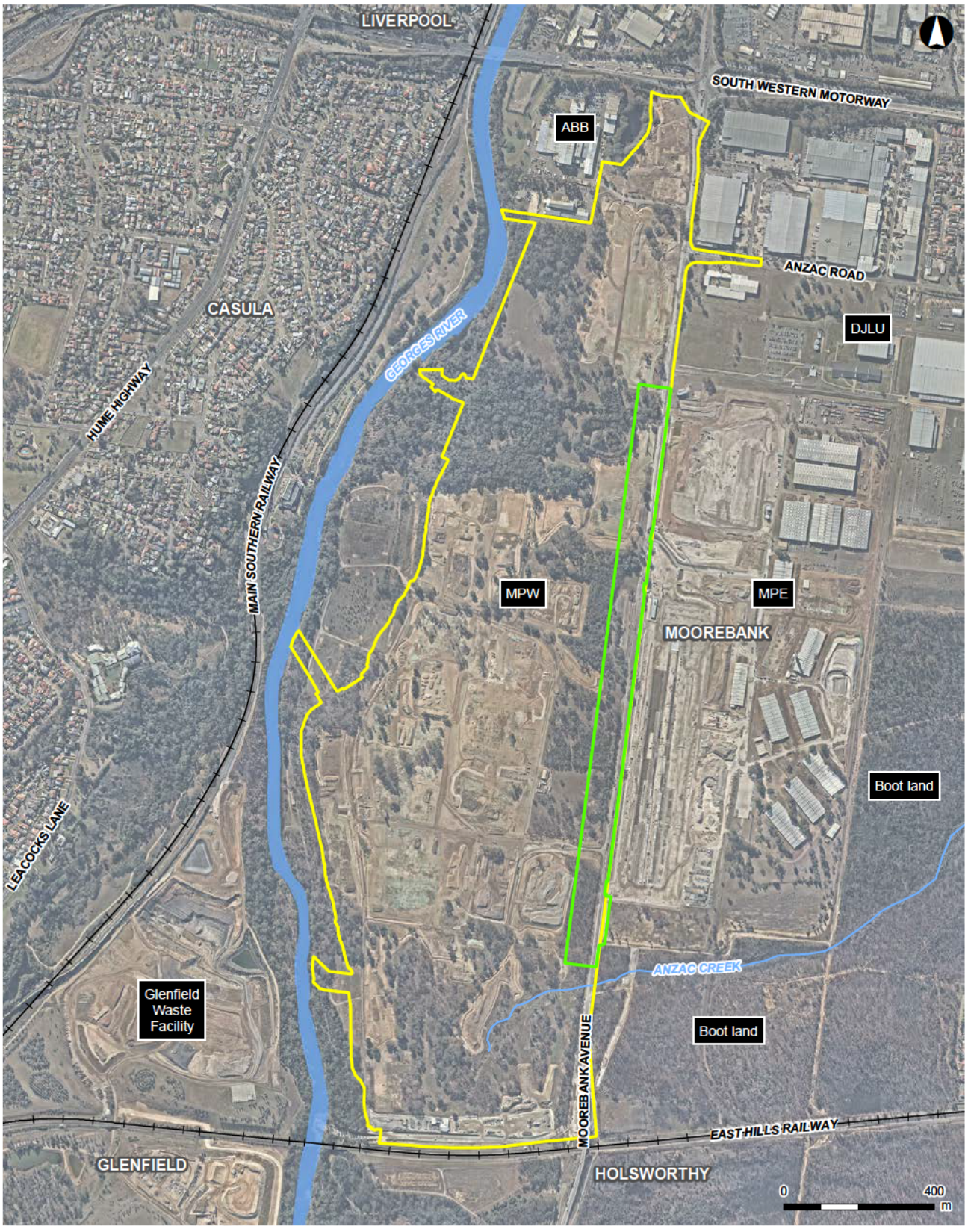
1 INTRODUCTION

The Sydney Intermodal Terminal Alliance (SIMTA) received approval for the construction and operation of Stage 2 of the Moorebank Precinct West (MPW) Project (SSD 7709), which comprises the second stage of development under the MPW Concept Approval (SSD 5066). This Construction Air Quality Management Plan (CAQMP) has been developed to manage air quality impacts during the construction phase of Stage 2 of the Moorebank Precinct West (MPW) Project (the Project).

Within this CAQMP, a strategy has been established to demonstrate the Construction Contractor's approach to the management of air quality impacts. This CAQMP addresses the relevant requirements of the Development Consent, including the Environmental Impact Statement (EIS), Response to Submissions (RtS) and Minister's Conditions of Consent (CoC), and the applicable guidelines and standards specific to the environmental management of air quality during the construction phase of the Project. The location of the Project site is shown in Figure 1-1.



LEGEND

- MPW Stage 2 construction area
- Moorebank Avenue site
- Existing railway
- Watercourse

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Coordinate System GDA 1994 MGA Zone 56
Aerial imagery supplied by nearmap (Sept, 2018)

1:15,000 at A4

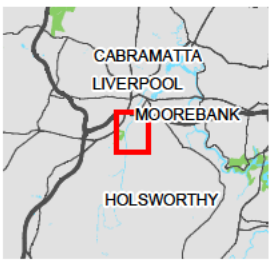

Figure 1-1: Site Location

1.1 Development Consent

The MPW Stage 2 Project has been assessed by the Department of Planning, Industry and Environment (DPIE) under Part 4, Division 4.7 of *the Environmental Planning and Assessment Act 1979* (EP&A Act) as State significant development (SSD). The Independent Planning Commission granted approval for the MPW Stage 2 Project on 11 November 2019 and is subject to the CoC (SSD 7709). The Project, including its potential impacts, consultation and proposed mitigation and management is documented in the following suite of documents:

- State significant development (SSD) Consent SSD 7709
- Moorebank Precinct West – Stage 2 – Environment Impact Statement (Arcadis Australia Pacific Pty Limited, October 2016)
- Moorebank Precinct West – Stage 2 – Response to Submissions (Arcadis Australia Pacific Pty Limited, July 2017)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approval (EPBC 2011/6086) granted on 27 September 2016.

1.2 Purpose

This CAQMP has been developed to address the CoC, Revised Compilation of Mitigation Measures (RCMMs) and the Revised Environmental Management Measures (REMMs). This plan aims to demonstrate how impacts to air quality will be managed during construction of the Project. This CAQMP provides methods to measure and reduce the impact to air quality by the Construction Contractor during construction, including all sub-contractor and consultant partners. The specific requirements of the CoC for compilation of the CAQMP, as identified in the CoC, RCMM and REMMs, are identified in the compliance matrices in Section 2.1.1 of this CAQMP.

It is noted that the footprint of the Moorebank Avenue Upgrade Works (MAUW) and associated works overlaps both the MPE Stage 2 (SSD 7628) project footprint and the MPW Site, (Figure 1-1). These works are currently, and will continue to be, undertaken as part of the MPE Stage 2 Project. Once the MAUW and associated works have been completed the area will revert to management under the MPW Stage 2 CEMP and this CAQMP.

The most recent, approved version of the CAQMP, will be implemented to manage the Project activities.

1.3 Objectives and Targets

Table 1-1 outlines the objectives and targets set out for the Project for the management of air quality during construction. These objectives and targets were developed by the Principal's Representative based on collective industry experience and best practice.

Table 1-1 Objectives and Targets

Objective	Target	Timeframe	Accountability^
Ensure impacts from dust emissions during construction are minimised for the nearest sensitive receptors	No visible dust leaving the Project site No community complaints, written warnings or infringement notices regarding excessive dust arising from the construction	Ongoing	Contractor's Environmental Manager (EM)

Objective	Target	Timeframe	Accountability^
Establish and maintain awareness of the importance of ensuring that air quality impacts associated with the project are avoided, where possible, or minimised	All Project and workforce personnel to complete an environmental induction, which will include information on the importance of minimising air quality impacts.	Ongoing	Contractor's EM
Ensure compliance with relevant CoC, applicable legislative and other requirements	No written warnings or infringement notices	Ongoing	Contractor's EM
Ensure that reasonable and feasible mitigation measures are implemented to manage impacts on surrounding residents and commercial stakeholders	No exceedances of dust and air quality criteria	Ongoing	Contractor's EM

^ Further details on the key roles and responsibilities associated with this CAQMP are provided in Section 2.2.

2 ENVIRONMENTAL MANAGEMENT

This section outlines the relevant legislation and project requirements that apply to air quality management and identifies additional permits and approvals that may be required during construction works.

2.1 Legal and Other Requirements

Table 2-1 details the legislation, planning instruments and guidelines considered during development of this plan. Further detail concerning the legislation, planning instruments and guidelines identified below are provided in the Compliance and Obligations Register within Appendix A of the CEMP.

Table 2-1 Legislation, Planning Instrument and Guidelines

Legislation and Guidelines	Description	Relevance to this plan
Environmental Planning and Assessment Act 1979	This Act establishes a system of environmental planning and assessment of development proposals for the State.	The Development Consent conditions, RCMMs and obligations are incorporated into this plan.
Protection of the Environment Operations Act 1997	Aims to achieve the protection, restoration and enhancement of the quality of the NSW environment	All plant will be operated in a proper and efficient manner such that air pollution is prevented. No offensive odour will be emitted during construction.
Protection of the Environment Operations (Clean Air) Regulation 2010 (the Regulation)	Includes provisions to regulate emissions to air in NSW including standards for air impurities emitted from activities and plant	Relevant requirements of the Regulation have been incorporated into this CAQMP.
Australian / New Zealand Standard AS/NZS 3580.1.1:2007 (Methods for Sampling and Analysis of Ambient Air, Part 1.1 Guide to Siting Air Monitoring Equipment)	Provides guidance for siting of air monitoring equipment	Used to inform the locations for proposed monitoring sites outlined in Section 4 of this CAQMP.
Australian / New Zealand Standard AS/NZS 3580.10.1:2016 (Methods for Sampling and Analysis of Ambient Air, Method 10.1 Determination of Particulate Matter – Deposited Matter – Gravimetric Method)	Describes the monitoring and analysis requirements for measuring nuisance dust	Guides the monitoring requirements outlined in Section 4 of this CAQMP.
Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales ("Approved Methods") (NSW Environment Protection Authority (EPA), 2005)	Lists the statutory measures for modelling and assessing air pollution form stationary sources in NSW	Outlines the impact assessment criteria used to assess compliance for this CAQMP.
NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (2011)	An environmental review that aims to benchmark the performance of the NSW coal mining industry against international best practice measures to prevent and/or minimise particle emissions.	Outlines dust minimisation measures used to throughout this CAQMP.

Additional guidelines and standards used in the preparation of this include:

- Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004).

2.1.1 Compliance Matrices

The Project is being delivered under Part 4, Division 4.7 of the EP&A Act. There is no specific requirement within the CoC for the development of CAQMP. Secondary requirements to be addressed in this plan and delivered during the Project are detailed in Appendix A.

The Revised Compilation of Mitigation Measures (RCMMs) were presented in the MPW Response to Submissions (Arcadis July 2017). A list of the RCMMs as relevant to the Project and how they have been compiled within this CAQMP are provided in Table 2-2. Other RCMMs required to be addressed in this plan are detailed in Appendix A.

Table 2-2 Revised Compilation of Mitigation Measures (RCMMs)

RCMM	Requirement	Document Reference
Primary RCMMs		
0B	The Construction Environmental Management Plan (CEMP), or equivalent, for the Amended Proposal would be based on the PCEMP (Appendix I of the EIS), and include the following preliminary management plans: • Preliminary Construction Traffic Management Plan (PCTMP) (Appendix M of the EIS) • Air Quality Management Plan (AQMP) (Appendix O of the EIS) • Erosion and Sediment Control Plans (ESCPs) and Bulk Earthworks Plans, within stormwater Drainage Design Drawings (Appendix R of the EIS) As a minimum, the CEMP would include the following sub-plans: • Construction Traffic Management Plan (CTMP) • Construction Noise and Vibration Management Plan (CNVMP), prepared in accordance with the Interim Construction Noise Guideline • Cultural Heritage Assessment Report/Management Plan • Construction Air Quality Management Plan • Construction Soil and Water Management Plan (SWMP), prepared in accordance with Managing Urban Stormwater, 4th Edition, Volume 1, (2004). • Erosion and Sediment Control Plan • Flood Emergency Response and Evacuation Plan • UXO, EO, and EOW Management Plan • Acid Sulfate Soils Management Plan • Bushfire Management Strategy Plan • Community Information and Awareness Strategy. • Flora and Fauna Management Plan (FFMP) • Groundwater Monitoring Program (GMP)	The CEMP This CAQMP

RCMM	Requirement	Document Reference
3A	A Construction Air Quality Management Plan would be prepared based on the Air Quality Management Plan (Appendix O of the EIS) and include the following key initiatives: • Procedures for controlling / managing dust • Roles, responsibilities and reporting requirements • Contingency measures for dust control where standard measures are deemed ineffective.	Section 2.2 outlines the roles and responsibilities associated with this air quality management plan Section 3.3 outlines the measures to manage dust Section 4.1 outlines the monitoring and improvement processes for the contingency of dust control measures deemed ineffective.

The Moorebank Intermodal Precinct West – Concept Proposal and Stage 1 Early Works (SSD 5066) was approved on 3 June 2016. The conditions of consent relate primarily to the management of Stage 1 Early Works or the assessment of later works and are therefore not included in this plan.

The Revised Environmental Management Measures (REMM) were presented in the Supplementary Response to Submissions Report (Parsons Brinckerhoff, August 2015). The REMMs relevant to this plan are identified in Table 2-3 and Appendix A.

Table 2-3 Revised Environmental Management Measures (REMMs)

REMM	Requirement	Mandatory (M)/ Subject to Review (SR)	Document Reference
Primary REMMs			
10A	A Dust Management Plan (DMP) (or equivalent) would be prepared as part of the CEMP.	M	This CAQMP

The EPBC Act Approval for the MPW Concept was granted by the Department of Agriculture, Water and Environment (DAWE) (formerly DotEE) in September 2016 (EPBC 2011/6086). This approval was provided for the impact of the MPW Project on listed threatened species and communities (Sections 18 and 18A of the EPBC Act) and Commonwealth land (Sections 26 and 27A of the EPBC Act). The construction of the Project has been designed to be consistent with the EPBC Act Approval conditions, where relevant, as presented in Table 2-4 and Appendix A.

It is noted that Revised Environmental Management Measures (EPBC REMM) are presented in the Moorebank Intermodal Terminal (MIT) Final EIS prepared to satisfy the Commonwealth approval process (EPBC Final EIS) dated December 2015 and are the same as the REMMs presented in the Supplementary Response to Submissions Report for the MPW Concept Proposal and Stage 1 Early Works (refer to Table 2-3 and Appendix A).

Table 2-4 EPBC Act Approval

Commonwealth	Requirement	Document Reference
10	Sections of the CEMP and OEMP relating to air quality must be prepared by a suitably qualified expert and must: a) be consistent with the Air Quality Provisional Environmental Management Framework (2 July	This plan a) Section 3.3, Section 4 and Appendix A

Commonwealth	Requirement	Document Reference
	2014), provided at Appendix O to the finalised EIS b) incorporate all measures 10A to 10U (CEMP only) and 10V to 10AH and 11A to 11H (OEMP only) from Table 7.1 of the finalised EIS that are described as 'mandatory' c) explain how all measures 10A to 10U (CEMP only) and 10V to 10AH and 11A to 11H (OEMP only) from Table 7.1 of the finalised EIS that are described as 'subject to review' have been addressed d) be approved by the Minister or a relevant New South Wales regulator.	b) Section 3.3 and Appendix A c) Not applicable – no measures were listed as 'subject to review' within Table 7.1 of the finalised EIS d) Section 1.4

2.2 Roles and Responsibilities

Key roles and responsibilities associated with this air quality management plan is presented in Table 2-5.

Table 2-5 Roles and Responsibilities

Roles	Responsibilities
Contractor's Construction Manager (Contractor's CM)	• Oversee the overall implementation of this CAQMP • Report on the performance of this CAQMP.
Contractor's Environmental Manager (Contractor's EM)	• Monitor and report on the implementation of the environmental components of this CAQMP, including compliance with relevant CoC • Undertake all air quality monitoring activities in accordance with this CAQMP • Ensure regular maintenance and quality control of monitoring equipment.
Site Supervisor	• Implement this CAQMP • Facilitate awareness of air quality impacts and deliver toolbox talks to site personnel • Undertake site inspections • Confirm all components of the implemented CAQMP meet requirements.
Contractor's Community Liaison Manager (Contractor's CLM)	• Manage complaints from members of the public with respect to issues in relation to this CAQMP • Liaise within the Community Engagement Consultant to communicate potential air quality impacts to the community.
All Personnel	• Comply with the requirements of this CAQMP.

2.3 Training

Training will be undertaken in accordance with Section 2.7 of the CEMP. The contractor will provide all employees with suitable environmental induction / training (relevant to this CAQMP) to ensure that they are aware of their responsibilities and are competent to carry out the work.

As a minimum the induction will include the following:

- The Project Environmental Policy and Environment Management System (EMS) requirements
- The requirements of this CAQMP, including environment incident reporting and methods for management of emissions
- Environmental emergency contact details.

Toolbox meetings will also be undertaken, as and when required.

2.3.1 Worker Competency

Competency training will be provided by the Construction Contractor as required and may include a certification, vocational qualification or a competency assessment. Personnel directly involved in implementing dust control measures on site will be given specific training in the various control and mitigation measures to be implemented.

Records of all training are to be filed in accordance with the document control system outlined in the CEMP.

3 IMPLEMENTATION

3.1 Existing Environment

3.1.1 Prevailing Wind Conditions

Figure 3-1 shows the seasonal wind rose of recorded wind speed and direction data from the Office of Environment and Heritage (OEH) Liverpool monitoring station (for the years 2011 to 2015), demonstrating the prevailing wind conditions in the area.

The recorded wind pattern is dominated by southwest to westerly airflow during autumn and winter, switching to easterly flow during summer months. The highest wind speeds are most frequently experienced from the southwest direction.

Average recorded wind speeds are low (approximately 2 m/s in all seasons), with the frequency of calm conditions (wind speeds less than 0.5 m/s) ranging from 8.5 to 12 % of the time.

The prevailing wind directions shown in Figure 3-1 is considered for monitoring site selection.

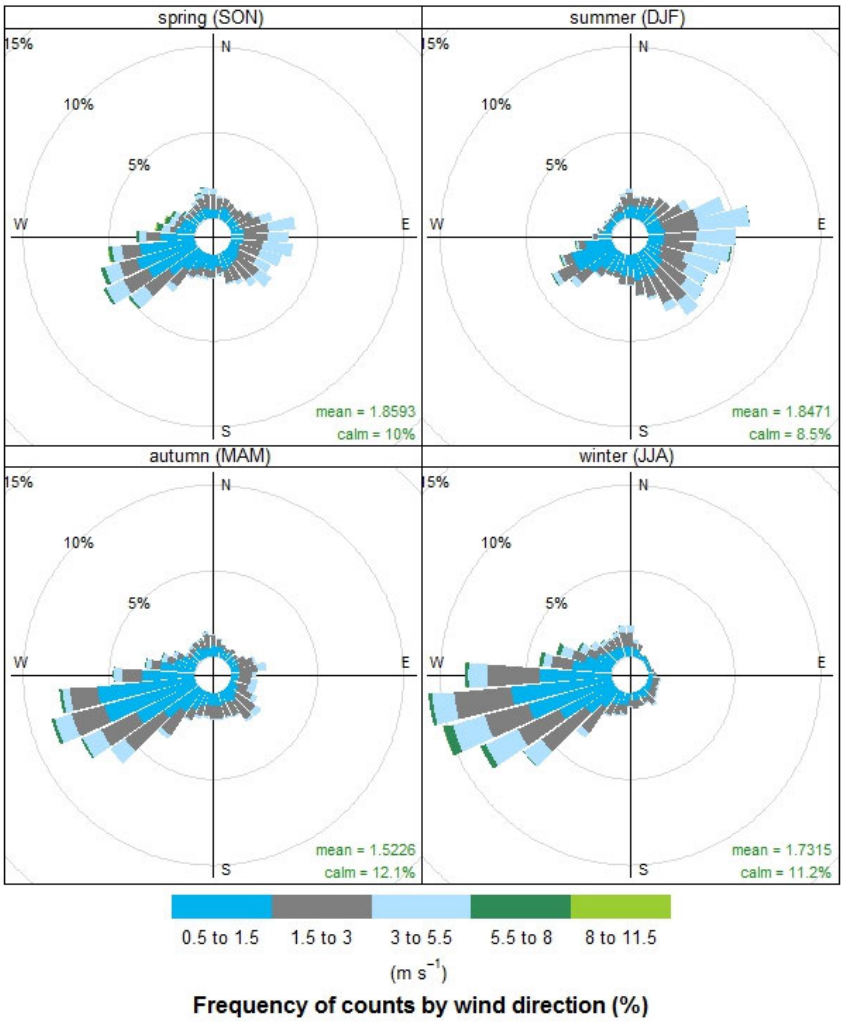

Figure 3-1 Seasonal Wind Rose – Liverpool 2011-2015

3.1.2 Existing Ambient Air Quality

Air quality data from the OEH Liverpool monitoring station was analysed over a five year period and was summarised in the MPW Stage 2 Air Quality Impact Assessment provided in Appendix O of the EIS. Baseline air quality for particles (PM_{10} and $PM_{2.5}$) can be described as fair to poor, while baseline air quality for NO_2, SO_2 and CO can be described as very good.

3.2 Aspects, Impacts and Risks

The principal pollutant of concern during construction will be fugitive dust / particulate matter (PM). The highest potential risk will occur during the site preparation, bulk earthworks, drainage, utilities and road work activity periods associated with the Project.

Potential emission sources for a representative worst-case construction scenario were identified and quantified in the MPW Stage 2 Air Quality Impact Assessment provided in Appendix O of the EIS and updated in the RtS to include additional wind erosion sources. The top three emissions sources are hauling (wheel generated dust), dozers (stripping, clearing, handling fill) and wind erosion. Dust management and management measures therefore focus on these main dust sources.

3.3 Management Measures

In accordance with CoC B46 and RCMM 3A, standard practice reactive and proactive management measures will be implemented to minimise dust generated during Construction. Proactive dust management measures are listed in Table 3-1 , based on the CoC, RCMMs and the REMMs, as well as the requirements and standards of SIMTA, the Construction Contractor and standard practice.

Further details on the monitoring requirements are provided in Section 4 including response procedures, corrective action and additional reactive controls to be implemented when proactive measures are deemed ineffective.

Table 3-1 Proactive Management Measures

ID	Management Measures	Timing	Responsibility	Reference
General				
AQ1	Management of emissions will be incorporated into Project inductions, training and pre-start talks.	During construction	Site Supervisor Contractor's EM	REMM 10C EPBC CoA 10 a)
AQ2	Implementation of an on-site meteorological station that will measure parameters including but not limited to: wind speed and wind direction. It will be implemented in accordance with relevant Australian Standard documentation and EPA guidelines	During construction	Contractor's EM	CoC A54 EPBC CoA 10 a)
Topsoil Stripping and Handling				
AQ3	Water carts will be used to control dust emissions from vehicles traveling on unpaved surfaces, graders and dozers pushing fill material and during fill handling and stockpiling activities.	During construction	Contractor's EM	RCMM 3A REMM 10B, 10D and 10H EPBC CoA 10 a)
AQ4	Progressive rolling and sealing of stripped areas.	During construction	Contractor's EM	RCMM 3A REMM 10M
AQ5	The extent of clearing of vegetation and topsoil will be staged and limited to the designated footprint required for construction.	During construction	Contractor's EM	RCMM 3A REMM 10M
AQ6	Revegetation or rehabilitation activities will proceed once construction activities were completed within a disturbed area.	Post construction	Contractor's EM	RCMM 3A REMM 10N EPBC CoA 10 a)

ID	Management Measures	Timing	Responsibility	Reference
Hauling				
AQ7	Land stabilisation works will be carried out progressively on site to minimise exposed surfaces.	During construction	Site Supervisor Contractor's EM	RCMM 3A REMM 10M
AQ8	Water carts will apply water at a rate of >2 L/m^2/hr on all unsealed internal roadways, work areas and travel routes. When necessary, paved roads must also be regularly swept and watered	During construction	Contractor's EM	RCMM 3A REMM 10D and 10H EPBC CoA 10 a)
AQ9	All construction vehicles on-site will be confined to a designated route with a speed limit of 20 km/hr enforced. Graders will be limited to a speed of 8 km/hr to reduce potential dust emissions.	During construction	Contractor's EM	RCMM 3A and 3B REMM 10D, 10J and 10K EPBC CoA 10 a)
AQ10	Trips and trip distances will be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips	During construction	Contractor's EM	REMM 10F EPBC CoA 10 a)
AQ11	Shaker grid and / or wheel cleaning will be used at site exits to minimise the potential for dirt tracking. A street sweeper will be made available to clean any dirt mud tracking on public / sealed roads.	During construction	Contractor's EM	RCMM 3A REMM 10F and 10H EPBC CoA 10 a)
AQ12	All trucks entering or leaving the site with loads must have their loads fully tarped.	During construction	Contractor's EM	RCMM 3A RCMM 6J REMM 10D and 10H EPBC CoA 10 a)
AQ13	Tailgates of road transport trucks will be securely fixed before loading and immediately after unloading.	During construction	Site Supervisor	REMM 10H EPBC CoA 10 a)

ID	Management Measures	Timing	Responsibility	Reference
AQ14	Each truck entry will be visually checked and documented to confirm that only approved materials that are consistent with the environmental approvals are allowed to enter the Project site. Where applicable, material characterisation reports/certification showing that the material being supplied is VENM/ENM will be provided	During construction	Site Supervisor Contractor's EM	RCMM 6J Standard Practice
AQ15	Vehicle movements will be limited to designated entries and exits, haulage routes and parking areas. Undertake haulage of imported fill in accordance with the Construction Traffic and Access Management Plan (CTAMP) and the Construction Spoil Management Plan (CSpMP).	During construction	Site Supervisor Contractor's EM	RCMM 3B REMM 10F EPBC CoA 10 a)
Fill Handling and Stockpiling				
AQ16	Dust generation will be monitored during site activities, including stockpiling and the importation of spoil. Work practices will be modified for dust generating activities (i.e. clearing and excavation) during periods of adverse weather (e.g. hot, dry and windy conditions based on visual / current conditions or local weather stations, where appropriate) and when dust is observed during the project site. Appropriate stockpile management measures (e.g. watering, compaction, etc.) must also be employed during adverse weather conditions and when dust is observed leaving site.	During construction	Site Supervisor Contractor's EM	RCMM 3A REMM 10B, 10D and 10I EPBC CoA 10 a) Blue Book
AQ17	Stockpiles, hardstand areas and exposed surfaces will be regularly watered (or other equivalent means) to minimise dust emissions, such that emissions will be halved relative to not applying the water (or other treatment).	During construction	Site Supervisor Contractor's EM	RCMM 3A REMM 10D, 10H and 10L

ID	Management Measures	Timing	Responsibility	Reference
AQ18	Unloading of dusty material / loads will be minimised by reducing drop heights and application of water sprays where required.	During construction	Site Supervisor Contractor's EM	RCMM 3A Standard Practice
AQ19	Stockpiles (treated and unstabilised) will not exceed an area of 1 hectare.	During construction	Site Supervisor Contractor's EM	REMM 10L EPBC CoA 10 a)
AQ20	Exposed areas and stockpiles (treated and unstabilised) will be limited in area and duration.	During construction	Site Supervisor Contractor's EM	REMM 10M EPBC CoA 10 a)
AQ21	Stabilisation (compaction / binder / hydromulch / hydroseeding with infertile cover crop) of stockpiles if not worked on for more than 10 days or of placed fill if construction does not commence within 10 days.	During construction	Contractor's EM	CoC B43 REMM 10M
AQ22	Visually monitor untreated / unstabilised stockpiles daily for moisture content to ensure dust generation is minimised.	During construction	Site Supervisor Contractor's EM	CoC B46 RCMM 3A REMM 10H
AQ23	Imported spoil will be suitably moist when delivered and will be bulldozed to the Project site.	During construction	Contractor's EM	RCMM 3A REMM 10L
Wind Erosion				
AQ24	Shade cloths and screens to be installed around work site compounds, stockpiles and along boundaries adjacent to sensitive receivers.	Prior to construction	Contractor's EM	REMM 10B and 10G EPBC CoA 10 a)
AQ25	Necessary vegetation and topsoil clearing will be limited to the minimum footprint required.	During construction	Contractor's EM	Standard practice

ID	Management Measures	Timing	Responsibility	Reference
AQ26	Wind erosion from stockpiles will be limited by minimising the number of workfaces on stockpiles and through temporary stabilisation (compaction of surface, water sprays, seeding, veneering).	During construction	Contractor's EM	REMM 10B and 10G
Diesel Exhaust				
AQ27	Construction plant and equipment be well maintained and regularly serviced in accordance with the manufacturer's specification and to remain within air quality guidelines and standards.	During construction	Contractor's EM	REMM 10O
AQ28	Registered road vehicles with smoky exhausts (more than 10 seconds) shall be excluded from the Project site.	During construction	Contractor's EM	Standard practice
AQ29	Unnecessary idling for trucks and plant will be avoided with engines turned off during periods of inactivity.	During construction	Site personnel	Standard practice
AQ30	Emissions from trucks will be regulated in accordance with the requirements prescribed in the National Environmental Protection Measure (NEPM) (Diesel Vehicle Emissions) (NEPC, 2001) or suitably relevant standards.	During construction	Contractor's EM	REMM 10Q EPBC CoA 10 a)
AQ31	All construction vehicles will be tuned to avoid releasing excessive smoke from the exhaust and will be compliant with OEH Smokey Vehicles Program under the Protection of the Environment and Operations Act 1997 (NSW) (POEO Act) and POEO Regulations (NSW) (2010).	During construction	Contractor's EM	REMM 10R EPBC CoA 10 a)
AQ32	All on-road trucks will comply with the Euro V emission (or suitably relevant) standards.	During construction	Contractor's EM	REMM 10S EPBC CoA 10 a)

ID	Management Measures	Timing	Responsibility	Reference
AQ33	All new off-road construction equipment will be required to meet, at minimum, the US Environmental Protection Agency (EPA) Tier 3 emission standards for non-road diesel engines.	Prior to construction	Contractor's EM	REMM 10T EPBC CoA 10 a)
Odour Emissions				
AQ34	Excavation works in potentially contaminated soils will be completed during optimal dispersive conditions to minimise odorous emissions.	During construction	Contractor's EM	CoC B47 REMM 10P EPBC CoA 10 a)
AQ35	Refuelling of plant and equipment will be sited as far from sensitive receivers as practical and limited to low volatility fuels (i.e. diesel) to prevent odour impacts.	During construction	Contractor's EM	CoC B47 Standard practice
AQ36	Temporary sewage collection (i.e. use of portaloos) will be sited to provide an adequate buffer to sensitive receivers (<200m from closest receivers) and will be operated to ensure no offensive odour (cleaned and emptied on a regular basis). Sewage will be disposed at a suitable licenced disposal facility.	During construction	Contractor's EM	CoC B47 Standard practice
AQ37	Laying of asphalt pavement will be undertaken infrequently and over short durations. An adequate buffer to sensitive receivers (<200m from closest receivers) and will be operated to ensure no offensive odour impacts.	During construction	Contractor's EM	CoC B47 Standard practice
Dust				
AQ38	Implement Action Response Level (ARL) of 50ug/m^3 for PM_{10} (i.e. where the 1-hour average is 50ug/m^3 or greater a trigger alert occurs and a proactive management response must be initiated)	Prior to construction	Contractor's EM	CoC B46 RCMM 3A REMM 10B and10U EPBC CoA 10 a)

ID	Management Measures	Timing	Responsibility	Reference
AQ39	Visually monitor stockpiles daily for moisture content to ensure dust generation is minimised.	During construction	Contractor's EM	CoC B46 RCMM 3A REMM 10B and 10H EPBC CoA 10 a)
AQ40	Dust deposition will be measured and reported on a monthly basis.	During construction	Contractor's EM	CoC B46 RCMM 3A EPBC CoA 10 a)

3.3.1 Additional Reactive Management Measures

In accordance with RCMM 3A, contingency measures are proposed to minimise environmental impact in the event that proactive measures are deemed ineffective. These reactive measures will be implemented in response to a visual inspection, an alert from the real-time boundary monitors or triggered by a non-compliance and/or community complaint are outlined in Table 3-2.

Table 3-2 Triggers for Reactive Management Measures

Trigger	Measure
Visible dust from haulage	Relocate water cart to control dust or increase watering intensity rate.
Excessive dust generation from stockpiles or exposed areas	Apply water to dampen surface or stabilise surface.
High winds	If dust seen leaving the Project site, relocate or cease that activity. Implement corrective/preventative actions and record actions taken. Notification to External Authorities where incident, environmental harm or community impact has occurred as required by CoC.
Excessive / prolonged generation of exhaust fumes	Ensure equipment is maintained to manufacturer's specifications, avoid exposure to sensitive receivers by relocating or turning off engines when not required. Where equipment does operate to manufactures specifications, equipment is to be put out of service or tagged-out and not used until repaired.
Air quality complaints received from the public or non-compliance with goals	Investigation into activities occurring at the time with reference to meteorological conditions and dust levels measured by monitoring equipment. Where the investigation can identify the activity, which results in the complaints, modified or additional mitigation measures will be developed or campaign monitoring instigated.

4 MONITORING AND REVIEW

4.1 Construction Air Quality Monitoring Program

As required by CoC B46, deposited dust must not exceed an increase of 2g/m^2/month or maximum of 4g/m^2/month deposited dust level. The Construction Air Quality Monitoring Program will focus on dust deposition monitoring (refer to Section 4.1.3) for compliance evaluation. This will be supplemented with real-time boundary monitoring and daily visual inspections, used to ensure dust management measures are effective (refer to Section 4.1.1 and 4.1.2).

An on-site meteorological station will be implemented on site to measure parameters including but not limited to: wind speed and wind direction that can be used to assist in the assessment of air quality exceedances.

4.1.1 Visual Monitoring

Visual monitoring under this plan will be undertaken by the Contractor's EM or Site Supervisor during daily inspections of construction activities to monitor compliance with the requirements of the CoC and this plan. Daily inspections will focus on the following key issues:

- Inspect and report on excessive dust being generated at source (wheel generated dust, scrapers / graders, dozers, excavators, wind erosion)
- Inspect and report on water cart activity and effectiveness
- Inspect and report on dust leaving the site
- Non-conformance (dust leaving the site) will be reported immediately to the Contractor's CM or management.

An Environmental Inspection Checklist will be used to maintain compliance and effectiveness of controls. Items that require action will be documented during environmental inspection and notified to the relevant Site Supervisor. The Site Supervisor will be responsible for providing appropriate resources in terms of labour, plant and equipment to enable items to be rectified in the nominated timeframes.

Daily inspections and maintenance of controls will be made by the Contractor's EM or Site Supervisor and maintenance will be recorded in site diaries during active site works.

4.1.2 Real-time Reactive Monitoring

Two real-time boundary monitors (DustTrak or similar) will be operated on the Project site boundary and used to determine if trigger levels (refer to Section 3.1.2) are breached and when additional dust controls may be required. The boundary monitoring locations are dynamic and can be moved on a monthly basis, positioned upwind and downwind of dust generating activities occurring for construction.

SMS alarms will be sent to the Contractor's EM when the measured concentrations at the Project site boundary exceed Action Response Levels (ARL). Once the ARL is triggered, the Contractor's EM will investigate the cause of the elevated concentration and determine the required corrective action.

The ARL set for the construction phase is 50ug/m^3 for PM_{10} (i.e. where the 1-hour average is 50ug/m^3 or greater a trigger alert occurs and a reactive management response must be initiated).

4.1.3 Compliance Monitoring

In accordance with EPBC CoA 10a) and section 6.1.4 of the Air Quality Provisional Environmental Management Framework, dust deposition will be measured and reported on a monthly basis.

The amenity impacts from nuisance dust generated during construction will be assessed at five locations around the Project site, in addition to the six locations already established for MPE S2 CAQMP (Figure 4-1). Nuisance dust will be measured and assessed using five (5) dust deposition gauges and operated in

accordance with Australian Standard AS/NZS 3580.10.1:2016 *"Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method"*.

The siting and locations for the monitors will be undertaken in accordance with AS/NZS 3580.1.1:2016 *"Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment"*. The main siting requirements to consider for this monitoring program are:

- Provision of a clear sky angle of 120 degrees for the monitoring inlet
- Separation distance of greater than 10m to the nearest tree
- Separation distance of greater than 1m from any wall (supporting structure).

Exposed gauges will be replaced on a monthly basis with analysis conducted at a NATA accredited laboratory for insoluble solids. Real-time monitors provide continuous air quality data.

The proposed monitoring sites are shown in Figure 4-1. Monitoring locations are selected by taking into account the location of construction activity (earthworks, demolition and haulage) and the prevailing wind directions, which are typically from the west-southwest or east-southeast. The monitoring locations are positioned at or close to the Project site boundary, so that dust levels can be evaluated beyond the Project site boundary. Also, for certain monitoring periods, some monitoring locations will be downwind of the Project site and can be used to provide an indication of background to inform the compliance evaluation.

Compliance will be assessed against the goals outlined in CoC B46, which are consistent with the NSW EPA's impact assessment criteria listed in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

The nuisance based goals for dust deposition outlined in Table 4-1 are prescribed as a maximum increase or a maximum total dust deposition rate, expressed as insoluble solids. Compliance assessment for the Project will be based on the maximum total dust deposition level (4 g/m^2/month), as there are no baseline data available prior to construction, to evaluate the increase in dust deposition from the Project. However, at certain times, some monitoring locations will be downwind of the Project site and other monitoring locations will be upwind of the Project site, which may enable compliance assessment against the criteria for maximum increase in dust deposition. Table 3-2 outlines the response mechanism (investigation) that will be implemented if exceedances to the dust deposition criteria are identified.

Table 4-1 Dust Deposition Goals

Pollutant	Maximum Increase in Dust Deposition	Maximum Total Dust Deposition Level
Deposited dust (assessed as insoluble solids)	2 g/m^2/month	4 g/m^2/month

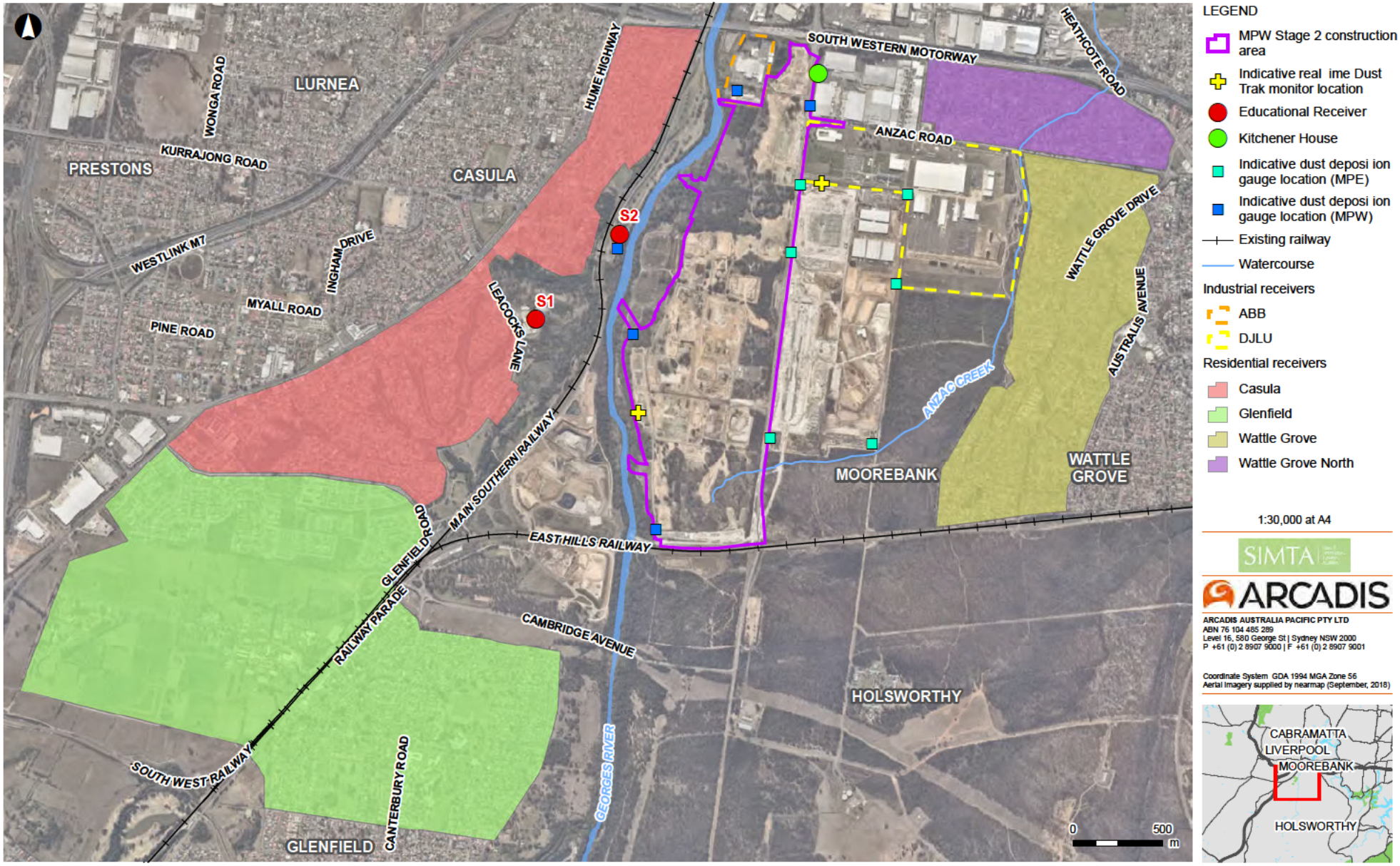

Figure 4-1: Air Quality Monitoring Sites

4.1.4 Summary of Construction Air Quality Monitoring Program

Table 4-2 below outlines the details of the Construction Air Quality Monitoring Program.

Table 4-2 Construction Air Quality Monitoring Program

Component	Indicator
Location References	Refer to Figure 4-1 (for dust deposition gauges only)
Types and numbers of Monitors	Dust deposition gauges (five) Real-time DustTrak monitors (two, location variable according to emission sources, prevailing or anticipated weather conditions, in response to complaints)
Responsibility	Contractor's EM
Frequency of Measurements	Monthly (dust deposition) Continuous (real-time boundary monitors)
Criteria	Dust deposition goals (e.g. CoC B46 states deposited dust must not exceed an increase of 2g/m^2/month or maximum of 4g/m^2/month at the closest off-site sensitive receiver).
Action Response Levels	50ug/m^3 for PM_{10} (i.e. where the 1-hour average is 50ug/m^3 or greater a trigger alert occurs and a reactive management response must be initiated)
Guidelines / Legislative Requirements	*Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales*
Monitoring of Effectiveness of Controls	Monthly monitoring Visual inspections of dust deposition will be undertaken on a daily and weekly basis Continuous (real-time boundary monitors)
Reporting of Monitoring	Monthly reports will be issued to the Principal's Representative

4.2 Environmental Auditing and Reporting

Environmental auditing and reporting of the Project during construction will be undertaken in accordance with Section 4.3 and Section 4.6 of the CEMP.

In addition, air quality monitoring results, will be included within the monthly environment and sustainability report prepared by the Contractor's EM and issued to the Principal's Representative.

4.3 Review and Improvement

Review and improvement of this plan will be undertaken in accordance with Section 4 of the CEMP. Continuous improvement will be achieved by the ongoing evaluation of environmental management performance and effectiveness of this plan against environmental policies, objectives and targets.

Revisions of this plan will be undertaken in accordance with Section 1.1.5 of the CEMP.

4.4 Incidents

In the event of a safety / environmental incident or unpredicted impacts, such as in relation to air quality management, it is the responsibility of all personnel to report to the Site Supervisor.

All environmental incidents will be managed and reported in accordance with Section 2.8 of the CEMP.

4.5 Non-Compliance

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 and non-conformances will be managed in accordance with Section 4.4 of the CEMP.

4.6 Complaints

Complaints will be managed in accordance with Section 2.6.3 of the CEMP and Section 3.3.6 of the Community Communication Strategy (CCS).

APPENDIX A COMPLIANCE AND OBLIGATIONS REGISTER

Secondary Recommended Conditions of Consent

CoC No.	Condition	Plan Section	How Addressed
Secondary Conditions			
A1	In addition to meeting the specific performance measures and criteria established under this consent all reasonable measures must be implemented to prevent, and if prevention is not reasonable, minimise, any harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Section 3.3 Section 4	Section 3.3 identifies the management measures to be implemented to prevent and minimise environmental harm. Section 4 sets out the process for monitoring and review of the effectiveness of these measures. Opportunities to further minimise environmental harm will be identified through the ongoing evaluation of environmental management performance and effectiveness of this plan.
A27	References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent. However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	Section 2.1	Section 2.1 outlines the guidelines, protocols, Australian Standards and policies considered during the development of this plan.
A40	Minor ancillary facilities, including lunch sheds, office sheds, portable toilet facilities, and the like, can be established where they satisfy the following criteria: … (i) minimal amenity impacts to surrounding residences and businesses, after consideration of matters such as compliance with the Interim Construction Noise Guideline (DECC, 2009), traffic and access impacts, dust and odour impacts, and visual (including light spill) impacts, and …	Section 1.2.3 of the CEMP (Rev H) Section 3.3	Section 1.2.3 of the CEMP (Rev H) details the requirements for establishing minor ancillary facilities on site. Section 3.3 identifies the management measures to be implemented to prevent and minimise environmental harm.
A54	Prior to the commencement of any works, and for the life of the development, the Applicant must ensure that there is a suitable meteorological station operating on the site or within the vicinity of the site that:		
	(a) complies with the requirements in the latest version of EPA's *Approved Methods for Sampling of Air*		A meteorological station will be placed on site and implemented

CoC No.	Condition	Plan Section	How Addressed
	Pollutants in New South Wales (DEC, 2016) (as may be updated or replaced from time to time); and		in accordance with the EPA's *Approved Methods for Sampling of Air Pollutants in New South Wales* (DEC, 2016) and the *NSW Noise Policy for Industry* (NPI, EPA, 2017).
	(b) is capable of continuous real-time measurement of atmospheric stability category determined by the sigma theta method in accordance with the *NSW Noise Policy for Industry* (NPI, EPA, 2017) (as may be updated or replaced from time to time).		
B43	Stockpiles must: (a) not exceed 10 m in height;	CSpMP	Addressed within the CSpMP which identifies measures to be implemented for the management of stockpiles during construction.
	(b) be benched over 4 m in height;		
	(c) have maximum of 1V:3H slopes; and		
	(d) be stabilised if not worked on for more than 10 days.	Section 3.3	Section 3.3 identifies the management measures to be implemented to prevent exceedances of this criteria
B46	The Applicant must ensure dust emissions generated by the development do not cause exceedances of the following criteria at private property not associated with the development:	Section 3.3 Section 4.1	Section 3.3 identifies the management measures to be implemented to prevent exceedances of this criteria Section 4.1 identifies the dust emissions criteria to be monitored for the project
	(a) 2g/m^2/month maximum increase in deposited dust level; and		
	(b) 4 g/m^2/month maximum deposited dust level.		
B47	The Applicant must ensure the development does not cause or permit the emission of any odour, which may be offensive odour (as defined in the POEO Act) outside of the premises (as defined in the POEO Act).	Section 3.3	Section 3.3 identifies the management measures to be implemented to minimise odorous emissions from site

Secondary Revised Compilation of Mitigation Measures (RCMMs)

The Revised Compilation of Mitigation Measures (RCMMs) were presented in the MPW Response to Submissions (Arcadis July 2017).

RCMM	Requirement	Where Addressed
Secondary RCMMs		
3B	Vehicle movements would be limited to designated entries and exits, haulage routes and parking areas.	Section 3.3
6J	In order to accept fill material onto site, the following will be undertaken: • Material characterisation reports/certification showing that the material being supplied is VENM/ENM must be provided. Each truck entry will be visually checked and documented to confirm that only approved materials that are consistent with the environmental approvals are allowed to enter the site. Only fully	Section 3.3 Also addressed within Section 3.9 of the Construction Spoil Management Plan.

RCMM	Requirement	Where Addressed
	tarped loads are to be accepted by the gatekeeper. Environmental Assurance of imported fill material will be conducted to confirm that the materials comply with the NSW EPA Waste Classification Guidelines and the Earthworks Specification for the MPW site. The frequency of assurance testing will be as nominated by the Environmental assuror/auditor.	

Secondary Revised Environmental Management Measures (REMMs)

The Revised Environmental Management Measures (REMM) were presented in the Supplementary Response to Submissions Report (Parsons Brinckerhoff, August 2015).

REMM	Requirement	Mandatory (M)/ Subject to Review (SR)	Where Addressed
Secondary REMMs			
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* (OEH 2011) would be considered.	M	Section 2.1 Section 3.3 The NSW Coal Mining Benchmarking Study: *Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (OEH 2011) was considered in the MIT (Revised Project) Local Air Quality Impact Assessment (Parsons Brinckerhoff, 2015)
10C	Methods for management of emissions would be incorporated into Project inductions, training and pre-start talks.	M	Section 2.3 Section 3.3
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	M	Section 3.2 Section 3.3
10E	A mechanism for raising and responding to complaints would be put in place for the duration of the construction phase.	M	Section 4.6
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).	M	Section 3.3 Also refer to the CTAMP which identifies fill haulage routes

REMM	Requirement	Mandatory (M)/ Subject to Review (SR)	Where Addressed
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.	M	Section 3.3
10H	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. • 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. Prevent, where possible, or remove, mud and dirt being tracked onto sealed road. • 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.	M	Section 3.3 CSpMP
10I	Where reasonable and feasible, dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions.	M	Section 3.3
10J	Project site speed limits of 20 km/h would be imposed on all construction vehicles travelling within the Project site	M	Section 3.3
10K	Graders would be limited to a speed of 8 km/h to reduce potential dust emissions.	M	Section 3.3
10L	Material stockpiles would not exceed an area of 1 ha and would be regularly watered to achieve 50% control of potential dust emission.	M	Section 3.3 CSpMP
10M	Exposed areas and stockpiles would be limited in area and duration. For example, vegetation stripping or grading would be staged where possible, unconsolidated	M	Section 3.3 CSpMP

REMM	Requirement	Mandatory (M)/ Subject to Review (SR)	Where Addressed
	stockpiles would be covered, or hydro mulch or other revegetation applicant applied to stockpiles or surfaces left standing for extended periods.		
10N	Revegetation or rehabilitation activities would proceed once construction activities were completed within a disturbed area.	M	Section 3.3
10O	Construction plant and equipment would be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards.	M	Section 3.3
10P	Excavation works in potentially contaminated soils should be managed to ensure that they are completed during optimal dispersive conditions to minimise odorous emissions.	M	Section 3.3
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.	M	Section 3.3
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 Protection of the Environment and Operations Act 1997 (POEO Act) and POEO Regulations (NSW) (2010).	M	Section 3.3
10S	All on-road trucks are to comply with the Euro V emission standards or suitably relevant standards.	M	Section 3.3
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.	M	Section 3.3
10U	Establishment of Action Response Levels (ARLs) for use with real-time dust management. These aid in the assessment of impact potential, and establish an early warning system during adverse trends, reducing complaint potential and non-compliance issues. An ARL trigger would be a defined measurement of elevated dust levels for a prolonged period.	M	Section 3.3 Section 4.1.2