Appendix B5: Air Quality Management Sub-Plan

CABRAMATTA LOOP PROJECT

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ACKNOWLEDGEMENT TO COUNTRY

Fulton Hogan acknowledges the Cabrogal of the Darug Nation People as the Traditional Owners of the land we are working on, and pay our respect to their Elders past, present and emerging.

We recognise their deep connection to Country and value the contribution to caring for, and managing the land and water.

We are committed to pursuing genuine and lasting partnerships with Traditional Owners to understand their culture and connections to Country in the way we plan for and carry out the delivery of the Works.

Fulton Hogan

Document control

This is an e-copy of the Plan and it interfaces with the other associated plans, which together describe the proposed overall project management system for the project.

The latest revision of this plan is available on the Fulton Hogan server. If any unsigned hard copies of this document are printed, they are valid only on the day of printing.

The revision number is included at the bottom of each page. When revisions occur, the entire document will be issued with the revision number updated accordingly for each owner of a controlled copy.

Attachments/Appendices to this plan are revised independently of this plan.

Revision History

REV	DATE	AUTHOR / REVISED BY	ENDORSED BY	BRIEF DESCRIPTION OF CHANGE
0	14/07/2021	[redacted]	[redacted]	Initial issue for ARTC review
1	03/08/2021	[redacted]	[redacted]	Revised in response to comments from ARTC and initial issue for ER review.
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3	17/09/2021	[redacted]	[redacted]	Revised in response to comments from the Alternate ER.

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Glossary/ Abbreviations

Term/ abbreviation	Definition
AQMP	Air Quality Management Sub-Plan
ARTC	Australian Rail Track Corporation
CEMP	Construction Environmental Management Plan
CoA	The Minister's conditions of approval for the CSSI.
Construction Boundary	Has the same meaning as the definition of the term in the Project approval: The area required for project construction as described in the documents listed in **Condition A1**.
CSSI	Critical State Significant Infrastructure, as described in Schedule 1 of the project approval, the carrying out of which is approved under the terms of the project approval.
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
DPIE EES Group	Environment, Energy and Science Group of DPIE
DPIE Water Group	Water Group of DPIE and the National Resources Access Regulator
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992).
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPL	Environment Protection Licence under the POEO Act
ER	Environmental Representative for the CSSI
ESCP	Primary Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
HP	Hold Point: a point in the construction or verification process beyond which work may not proceed without receiving authorisation from the appropriate party.
Minister, the	NSW Minister for Planning and Public Spaces
NA	Not applicable
Non-compliance	Failure to comply with the requirements of the Project Approval or any applicable license, permit or legal requirements.
Non-conformance	Failure to conform to the requirements of project system documentation including this PCEMP or supporting documentation.
OEH	Office of Environment and Heritage
OEMS	Operational Environmental Management System
PESCP	Progressive Erosion and Sediment Control Plans
Planning Secretary, the	Has the same meaning as the definition of the term in the Project approval: Planning Secretary of DPIE (or nominee, whether nominated before or after the date on which the project approval was granted)

Term/ abbreviation	Definition
Planning Secretary's approval or agreement, the	Has the same meaning as the definition of the term in the Project approval: A written approval or agreement from the Planning Secretary (or nominee)
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
Project, the	Cabramatta Loop
Project approval, the	The Minister's approval for the CSSI.
Publicly Available	Has the same meaning as the definition of the term in the Project approval: To be made available on the website required under Condition B10 of the project approval.
Relevant council(s)	Has the same meaning as the definition of the term in the Project approval: Any or all as relevant, Fairfield City Council or Liverpool City Council.
RMM	Revised Mitigation Measure
SWMP	Soil and Water Management Plan
TfNSW	Transport for NSW
WEMP	Waste and Energy Management Sub-Plan
Work	Has the same meaning as the definition of the term in the Project approval: Any physical work for the purpose of the CSSI including construction and low impact work.

1. Introduction

1.1. Purpose

This Air Quality Management Sub-Plan (AQMP) describes how Fulton Hogan will manage and control emissions, including those generated by dust and vehicle exhausts during construction of the Cabramatta Loop Project (the project) to minimise environmental impacts.

This AQMP has been prepared to detail how Fulton Hogan will comply with the project approval, and implement and achieve relevant performance outcomes, commitments and mitigation measures specified in the EIS as amended by the Submissions Report (also known as 'Revised Mitigation Measures' (RMM)) during construction of the project. Additionally, this AQMP has been prepared to address the requirements of ARTC Technical Specification and Works Description (TSWD) Appendix 04 Additional Environmental Requirements and Environment Protection Licence (EPL) Number 3142 (held by ARTC for railway activities – railway infrastructure operations) to the extent that it applies to Fulton Hogan's activities.

For the avoidance of doubt, the CEMP (including this AQMP) relates to the construction phase only. Detailed design environmental requirements will be addressed as part of the detailed design phase, separate to the CEMP approvals process. Detailed design is generally completed about six months after CEMP approval. In addition, operational environmental requirements will be met during the operational phase (upon the completion of construction) and addressed in the Operational Environmental Management System (OEMS) required under CoA D1.

1.2. Background

Chapter 10 of the EIS assessed the extent and magnitude of potential impacts of construction and operation of the project on air quality. As part of this, a detailed air quality impacts assessment was undertaken and included in the EIS as:

- EIS Volume 3 – Technical Report 3 – Cabramatta Loop: Air Quality Impact Assessment, prepared by GHD on behalf of ARTC, August 2019

The EIS assessed the potential impacts of construction and operation of the project on air quality. The assessed risk level for potential air quality risks during construction was low or medium. Risks with an assessed level of medium were generation of dust from exposed soil/ stockpiles, excavation and vehicle movements; emissions from vehicles or plant; and generation of dust from transport of uncovered loads.

The EIS determined that exhaust emissions generated during construction would not significantly contribute to emissions in the area, given the existing levels of vehicle use. Construction vehicles are expected to travel along the alignment and resulting emissions will be discontinuous, transient and mobile.

1.3. Structure of AQMP

This AQMP is part of Fulton Hogan's environmental management framework for the project and is supported by other documents, such as Environmental Work Method Statements. The review and document control processes for this AQMP are described in Chapters 11 and 12 respectively of the CEMP.

1.4. Consultation for Preparation of the AQMP

In accordance with CoA C4, no government agency or council consultation is required during the preparation of this AQMP.

Ongoing consultation will be undertaken during detailed design and construction of the project as required by the environmental documents. This will be subject to a separate consultation process to that required for preparation of this AQMP.

2. Objectives, Targets and Environmental Performance Outcomes

2.1. Objectives

The key objective of the AQMP is to ensure that impacts on air quality are minimised and within the scope permitted by the project approval. To achieve this objective, Fulton Hogan will undertake the following:

- Ensure appropriate controls and procedures are implemented during construction activities to avoid or minimise potential adverse impacts to sensitive receivers along the Project corridor
- Ensure appropriate measures are implemented to address the relevant CoA and RMM outlined in Table 3 and Table 4 respectively.
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Chapter 3 of this AQMP.

2.2. Targets

The following targets have been established for the management of air quality impacts during the project:

- Ensure full compliance with the relevant legislative requirements, CoA and RMM outlined in Table 3 and Table 4 respectively.
- Meet the monitoring targets detailed in Table 2.

2.3. Environmental Performance Outcomes

The construction-related environmental performance outcomes relevant to this AQMP are listed in Table 1. A cross reference is also included to indicate where the environmental performance outcome is addressed in this AQMP in terms of how it will be implemented and achieved.

Table 1: Environmental Performance Outcomes Relevant to Air Quality Management

Key Issue (as listed in Table 22.5 of the EIS)	Environmental Performance Outcome	Document Reference
4. Air quality	The project is constructed and operated in accordance with the requirements of the POEO Act and ARTC's EPL #3142.	Section 1.1 Section 3.1 Operational EPL #3142 requirements will be met during the operational phase (upon the completion of construction) and addressed in the OEMS required under CoA D1.
	Dust generated during construction will not exceed the relevant criteria in the *National Environment Protection (Ambient Air Quality) Measure and the Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005)	Chapter 6 mitigation measures Section 3.2.1

3. Legal and Other Requirements

3.1. Legislation

Legislation relevant to air quality management includes:

- *Environmental Planning and Assessment Act 1979 (NSW)* (EP&A Act)
- *Protection of the Environment Operations Act 1997 (NSW)* (POEO Act)
- *Protection of the Environment Operations (Clean Air) Regulation 2010* (NSW)
- *National Greenhouse and Energy Reporting Act 2007* (Cth)
- *Protection of the Environment (Air Toxics) Regulation 1998 (NSW)* (as amended)
- *Protection of the Environment (General) Regulation 2009* (NSW)
- *Protection of the Environment (Ambient Air Quality) Regulation 1998 (NSW)* (as amended)

Relevant provisions of the above legislation are explained in the Register of Legal and Other Requirements included in Appendix A1 of the CEMP.

3.2. Guidelines and Standards

The main guidelines, standards and policy documents relevant to this AQMP include:

- Air Quality Monitoring Criteria for Deposited Dust (DEC Guideline)
- National Environment Protection Council's (NEPC) – NEPM for Ambient Air Quality Guidelines
- AS/NZS 3580 1.1.2016 Siting Air Quality Monitoring Equipment Guide
- AS/NZS 3580.10.1:2016 Methods for sampling and analysis of ambient air Determination of particulate matter - Deposited matter - Gravimetric method
- AS/NZS 3580.12.1:2015 Methods for sampling and analysis of ambient air, Method 12.1: Determination of light scattering - Integrating nephelometer method.
- Action for Air 1998 (NSW DEC)
- Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (EPA 2016).
- National Environment Protection (Ambient Air Quality) Measure.
- Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (NSW EPA 2016)

3.2.1. Construction Air Quality Criteria

The EPA specifies ground-level concentration criteria for pollutants within '*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*'. The relevant construction goal that will be adopted for the project is related to dust as provided in Table 2. It is noted that the *National Environment Protection (Ambient Air Quality) Measure* relates to the protection of human health and well-being and does not include criteria for dust.

Table 2: Air Quality Monitoring Criteria for Deposited Dust

Pollutant	Averaging period	Goal	Source
Deposited dust[b]	Annual	2 g/m2/month[c] 4 g/m2/month[d]	NERDDCe (1998)[a]

Notes:

a. Adapted from Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (EPA 2016)

b. Dust is assessed as insoluble solids as defined by AS/NZS 3580.10.1:2016

c. Maximum increase in deposited dust level

d. Maximum total deposited dust level

e. NERDDC – National Energy Research, Development and Demonstration Council

3.3. Conditions of Approval

The CoA relevant to this AQMP are listed in Table 3. A cross reference is also included to indicate where the condition is addressed in this AQMP or other project management documents.

Table 3: Conditions of Approval Relevant to AQMP

CoA No.	Condition Requirements	Document Reference
PART C - CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN		
C5 (a)	The **CEMP Sub-Plans** must state how: the environmental performance outcomes identified in the documents listed in **Condition A1** as modified by these conditions will be achieved;	 Section 2.3
(b)	the mitigation measures identified in the documents listed in **Condition A1** as modified by these conditions will be implemented;	Through the implementation of this AQMP (in particular refer to Section 3.4).
(c)	the relevant terms of this approval will be complied with; and	Through the implementation of this AQMP (in particular refer to Part E Air Quality CoA cross references below).
(d)	issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed.	Chapter 5, second paragraph Chapter 6
C6	Details of all information requested by an agency to be included in a **CEMP Sub-plan** as a result of consultation, including copies of all correspondence from those agencies, must be provided with the relevant **CEMP Sub-Plan**.	Section 1.4
C7	Construction must not commence until the **CEMP** and all **CEMP Sub-Plans** have been approved by the ER and must be implemented for the duration of construction. Where construction of the CSSI is staged, construction of a stage must not commence until the **CEMP** and sub-plans for that stage have been approved by the **ER**.	CEMP (main section) Sections 1.4 and 2.2
PART E – AIR QUALITY		
E1	In addition to the performance outcomes, commitments and mitigation measures specified in the documents listed in **Condition A1**, all reasonably practicable measures must be implemented to minimise the emission of dust, odours and	Chapter 6 mitigation measures

CoA No.	Condition Requirements	Document Reference
	other air pollutants during the construction and operation of the CSSI.	

3.4. Revised Mitigation Measures

Relevant construction-related RMM from the Submissions Report are listed in Table 4. A cross reference is also included to indicate where the measure is addressed in this AQMP or other project management documents.

Table 4: Revised Mitigation Measures Relevant to AQMP

ID No.	Revised Mitigation Measure	Document Reference
Dust Deposition and Decrease in Receptor Amenity – Minor and Temporary		
C3.1	Dust suppression will be undertaken as required using water sprays, water carts or other media on: ▪ unpaved work areas subject to traffic or wind ▪ sand, spoil and aggregate stockpiles ▪ the loading and unloading of dust generating materials.	Chapter 6 mitigation measure ID AQMM1, AQMM2, AQMM3, AQMM10.
Vehicle Emissions		
C3.2	Plant and equipment will be maintained in good condition and in accordance with manufacturer's specifications to minimise spills and air emissions that may cause nuisance.	Chapter 6 mitigation measure ID AQMM12.
Dust Deposition and Decrease in Receptor Amenity – Minor and Temporary		
C3.3	If the works are creating levels of dust which significantly impact on residential amenity, the works will be modified or stopped until the dust hazard is reduced to an acceptable level.	Chapter 6 mitigation measure ID AQMM8.
C3.4	The size of stockpiles will be minimised, where possible.	Chapter 6 mitigation measure ID AQMM11.
C3.5	Construction vehicles with potential for loss of loads (such as dust or litter) will be covered when using public roads	Chapter 6 mitigation measure ID AQMM9.

4. Existing Environment

This Chapter provides a brief summary of what is known about air quality within and adjacent to the project based on information provided in Chapter 10 of the EIS.

4.1. Ambient Air Quality

4.1.1. General Characteristics

Ambient air quality in Sydney is influenced by a number of factors, including topography, prevailing meteorological conditions (such as wind and temperature, which vary seasonally), and local and regional air pollution sources (such as motor vehicles, industrial facilities and bushfires). Consequently, regional air quality can be highly variable and impacted by events occurring a significant distance away (EIS, p10.3).

The NSW OEH operates ambient air quality monitoring stations in selected areas around NSW. The nearest station to the project site is Liverpool, however Chullora has also been included as it contains background data for sulphur dioxide (SO2). Ambient air pollutant concentrations recorded at Liverpool and Chullora OEH stations include emissions from all regional sources. Cumulative assessment of all regional sources of air pollution are accounted for by including the ambient air quality concentrations measured at the Liverpool and Chullora OEH stations and adding them to incremental site impacts (EIS, p10.3).

Daily pollutant average and maximum ambient concentrations for the modelled year are presented in Table 5. This data shows that the maximum recorded PM_{10} and $PM_{2.5}$ background concentrations at the Liverpool OEH station are higher than the assessment criteria. This is consistent with air quality results noted in NSW, which experienced poorer air quality during 2013, mainly due to drier and hotter weather through the middle of the year and the impact of bushfires in September, October and November. Background concentrations of all other pollutants were below the assessment criteria (EIS, p10.3).

4.1.2. Local Emission Sources

The main local sources of air pollution in the area include (EIS, p10.3 and p10.4):

- Vehicle emissions especially from the arterial roads such as Hume Highway, The Horsley Drive, Elizabeth Drive and Newbridge Road
- Suspended dust along roadways, from pulverized pavement materials, particles from brake linings and tyres
- Residential emissions such as domestic products as well as fuel combustion from domestic machinery such as lawn mowers, etc.
- Dust and diesel emissions from existing rail movements along the network between Warwick Farm and Cabramatta stations
- Secondary particulate emissions from freight and passenger train movement (i.e. wheel and brake action, wagon turbulence in the rail corridor and windblown particulates).

Table 5: Ambient Air Quality Daily Concentrations (2013) (EIS, p10.3)

Pollutant concentrations		OEH monitoring site	
		Liverpool	Chullora
SO_2	Average (µg/m^3)	-	2.6
	Maximum (µg/m^3)	-	31.4
Nitrogen oxide (NO)	Average (µg/m^3)	18.4	17.2
	Maximum (µg/m^3)	290.3	413.3
Nitrogen dioxide (NO_2)	Average (µg/m^3)	20.7	24.4
	Maximum (µg/m^3)	105.3	103.4
Ozone (O_3)	Average (µg/m^3)	29.4	27.4
	Maximum (µg/m^3)	229.3	205.8
Carbon monoxide (CO)	Average (µg/m^3)	0.5	0.3
	Maximum (µg/m^3)	4.6	4.0
PM_{10}	Average (µg/m^3)	21.0	18.3
	Maximum (µg/m^3)	98.5	69.4
	70th percentile (µg/m^3)	25.2	20.6
$PM_{2.5}$	Average (µg/m^3)	9.4	8.4
	Maximum (µg/m^3)	73.8	49.1
	70th percentile (µg/m^3)	10.8	9.5

'-'denotes data not sampled at the site

4.1.3. Sensitive Receivers

The project site is situated in a mixed residential and commercial area. The land adjacent to the rail corridor is predominantly residential and recreational with smaller sections of business and general industrial.

The project site is surrounded by a wide range of sensitive receptors, including:

- residential properties
- businesses
- community facilities (such as schools, and sporting facilities), and
- recreational areas.

A number of these receptors are located within or immediately adjacent to the project site. It is expected that the closest receptors will experience the worse-case air quality impacts. If potential air quality impacts from the project comply with the impact assessment criteria at the nearest receptors, then those situated at a greater distance will also likely comply (EIS, p10.4).

The location of representative sensitive receivers as identified in the EIS is shown in Figure 1.

Figure 1: Location of Representative Sensitive Receivers as Identified in the EIS (p10.5)

Figure 1 Representative Sensitive Receivers Location Descriptions:

R01	Cabramatta Train Station
R02	Cabramatta Inn
R03	Residential location
R04	Residential location
R05	Residential location
R06	Cabramatta Smash Repairs
R07	Residential Location
R08	Cabramatta Rugby League Club
R09	Jacquie Osmond Reserve
R10	Stroud Park
R11	Peter Warren Skoda
R12	Lawrence Hargraves School
R13	Peter Warren Honda
R14	Residential Location
R15	Peter Warren Mercedes Benz

5. Environmental Aspects and Impacts

The key construction activities and the associated potential sources of air quality impact are identified through a risk management approach. The consequence and likelihood of each activity's impact on the environment has been assessed to prioritise its significance. The results of this risk assessment are included in Appendix A3 of the CEMP.

Ongoing environmental risk analysis will be undertaken during construction through regular inspections, monitoring and auditing as described in Chapter 8. This will ensure that issues requiring management (including cumulative impacts) are appropriately managed.

5.1. Construction Activities

Construction activities, including earthmoving, storage and transport of spoil and waste materials, and exhaust emissions from construction equipment and vehicles, have the potential to impacts on local air quality. The main potential impact on air quality during construction is dust and this is described further below (EIS, p10.6).

5.1.1. Dust generation

The processes that have the potential to generate particulate matter during construction are:

- Mechanical disturbance – dust emissions as a result of earthworks/ excavation and the operation/ movement of construction vehicles and equipment
- Wind erosion – dust emissions from disturbed soil surfaces and stockpiles in windy conditions.

The EIS (p10.6) identified the project activities likely to generate dust include:

- Building new rail track – providing a 1.65 kilometre long section
- Realigning the track realignment – moving about 550 metres of existing track sideways
- Building two new bridges next to the existing rail bridges over Sussex Street and Cabramatta Creek
- Reconfiguring Broomfield Street for a distance of about 680 metres between Sussex and Bridge streets
- Plant operations in compounds and work areas
- Minor works in the form of new signalling installed at a number of locations within the rail corridor outside the project site
- Building an embankment at Jacquie Osmond Reserve
- Transport, handling, stockpiling, loading and unloading of spoil and imported materials
- Temporarily relocating part of the pedestrian footbridge over Cabramatta Creek.

5.1.2. Vehicle and Plant Emissions

The main source of emissions would be from the combustion of diesel fuel and petrol from heavy vehicles, mobile excavation machinery, and stationary combustion equipment as well as from the handling and/or on-site storage of fuel and other chemicals. The volume of emissions from construction vehicles and machinery would depend on the type of fuel used, the power output and condition of the engine, and duration of operation (EIS p10.7).

5.2. Factors Likely to Affect Dust Generation and Impacts

In addition to the inherent risks of specific construction activities creating the potential to generate dust, a number of other environment factors also affect the likelihood of dust emissions. These include:

- Wind direction – determines whether dust and suspended particles are transported in the direction of the sensitive receivers
- Wind speed – governs the potential suspension and drift resistance of particles
- Soil type - more erodible soil types have an increased soil or dust erosion potential
- Soil moisture – increased soil moisture reduces soil or dust erosion potential

- Rainfall or dew – rainfall or heavy dew that wets the surface of the soil and reduces the risk of dust generation.

5.3. Impacts

5.3.1. Dust Generation

Given the primary air quality concern during construction is dust, a screening level dust assessment was undertaken for proposed construction activities as part of the EIS (p10.6).The modelled scenario assumes construction works occurring along the rail corridor and the results indicate the following (EIS p10.6):

- all particulate concentrations (daily and annual TSP, PM_{10} and $PM_{2.5}$) are composed of high background concentration and relatively low incremental site impacts
- daily PM_{10} and $PM_{2.5}$ criteria are met at 25 metres from and on the boundary of the project site, respectively
- annual TSP and PM_{10} are met at 2 and 30 metres from the boundary of the project site, respectively. Annual $PM_{2.5}$ results are higher than the criteria as the 9.4 µg/m3 background concentration from the nearest station is already above the criteria.

A number of sensitive receivers within 25 metres of the project site could experience short term elevated PM_{10} concentrations. This is not anticipated to impact on the local amenity. It is expected that the location of construction works will vary as the project proceeds and consequently, no long term particulate concentration impacts are expected from construction of the project (EIS p10.6).

Utility relocation and protection works have the potential to impact on nearby sensitive receivers. It is expected that these construction works will involve little or minor dust generating activities as only small trenches will be dug for conduits and cables and would therefore result in negligible additional impact. As a result of the limited scale of earthworks and nature of the works proposed, dust emissions are expected to be manageable through the implementation of standard erosion control and dust management measures outlined in Chapter 6.

Construction work will be sequenced through the project site so that impacts on sensitive receivers would be minor and short term (EIS, p10.7).

5.3.2. Vehicle and Plant Emissions

Exhaust emissions generated during construction would not significantly contribute to emissions in the area, given the existing levels of vehicle use. Construction vehicles are expected to travel along the alignment and resulting emissions will be discontinuous, transient, and mobile (EIS p10.7).

These potential impacts would be adequately managed through the implementation of the mitigation measures provided in Chapter 6.

6. Environmental Mitigation Measures

Specific mitigation measures to address impacts on air quality are outlined in Table 6.

Table 6: Air Quality Mitigation Measures

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
DUST				
AQMM1	Progressively stabilise all exposed surfaces and long term stockpiles (unused for longer than 4 weeks) as soon as practicable to minimise wind-blown dust.		✓	Foreman Project / Site Engineer Superintendent Environmental Coordinator Construction Manager
AQMM2	Water dust generating materials during loading and unloading, and unsealed active work areas (including stockpiles and haul roads) during working hours to minimise wind-blown or traffic generated dust emissions.		✓	Foreman
AQMM3	Cover unsealed roads with densely graded road base, water, or polymers where uncontrolled dust is observed.		✓	Foreman
AQMM4	Restrict speeds of construction traffic to 20km/h, or 40km/h for haul roads. Signpost the speed limit.		✓	Foreman
AQMM5	Restrict construction traffic to designated roadways.		✓	Foreman
AQMM6	Control mud tracking on public roads by installing stabilised access (e.g. hardstand, rock, rumble grids, or wheel washes) at all access/egress points on site.		✓	Foreman
AQMM7	Remove mud spilt by construction traffic from public roads as soon as practicable but no later than by the end of each working day and prior to wet weather events.		✓	Foreman
AQMM8	Modify or stop construction activities if the works are creating levels of dust which significantly impact on residential amenity, during periods of strong wind (in excess of 40km/h) and in response to strong wind weather forecasts to prevent excessive airborne dust. Promote this in the internal communications (e.g. site weather update email). The works will be modified or stopped until the dust hazard is reduced to an acceptable level.		✓	Foreman Environmental Coordinator

ID	Mitigation Measure	Timing		Responsibility
		PC[1]	C[2]	
AQMM9	Cover all loads that enter or leave the site to minimise potential for odour/ dust impacts.		✓	Subcontractors Foreman
AQMM10	Use dust suppressants (e.g. soil stabilisers, polymers) and temporary ground covers (e.g. hydromulch) as much as possible to stabilise disturbed surfaces, such as batters and stockpiles, and minimise visible airborne dust emissions.		✓	Foreman Environmental Coordinator
AQMM11	Minimise the size of stockpiles, where possible. This includes limiting topsoil stockpiles to 2m high where there is sufficient area as per the Blue Book.		✓	Foreman
OTHER POLLUTANTS, SUCH AS EXHAUST				
AQMM12	Maintain all vehicles, plant and construction equipment in good working order in accordance with the manufacturer's specification to minimise spills and air/exhaust emissions that may cause nuisance.		✓	Procurement Coordinator Foreman
AQMM13	Turn machinery, vehicles and lights off when not in use.		✓	Subcontractors Foreman
AQMM14	Where practicable, ensure vehicles are fitted with pollution reduction devices.		✓	Procurement Coordinator
AQMM15	No burning off (e.g. of cleared and grubbed vegetation or waste).		✓	Subcontractors Foreman

[1] PC means pre-construction; [2] C means construction

7. Compliance Management

7.1. Roles and Responsibilities

Fulton Hogan's Project Team organisational structure and overall roles and responsibilities are outlined in Section 4.1 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 6 of this AQMP.

7.2. Training

All employees, subcontractors and utility staff working on site will undergo site induction training relating to air quality management issues, including:

- requirements of this AQMP, including stop work protocols, investigating alternatives/ modifying construction activities and implementing additional controls, where required
- relevant legislation
- roles and responsibilities for air quality management

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in air quality management. Examples of training topics include:

- Planning and preparedness for strong wind events (in excess of 40km/h) / dust risk periods
- Lessons learnt from dusty periods, incidents and other events, e.g. low rainfall / strong wind (in excess of 40km/h)

Further details regarding staff induction and training are outlined in Chapter 5 of the CEMP.

7.3. Complaints

Complaints will be recorded and addressed in accordance with Section 6.2.3 of the CEMP and the Communication Strategy (CS).

7.4. Inspections and Monitoring

Regular inspections and monitoring specific to air quality will be undertaken during construction in accordance with Table 7. General requirements and responsibilities in relation to inspections and monitoring are documented in Sections 8.1 and 8.2 of the CEMP respectively.

Table 7: Inspections and Monitoring

Monitoring Details	Area	Record	Responsibility	Frequency
Meteorological data, including rainfall, temperature, relative humidity, wind (direction and speed)	All	Weather forecasts from Bureau of Meteorology (BoM)	Environmental Coordinator	Daily
Visual observations during daily site inspections, including activities observed outside of the project that may impact on dust	All	Noted in site diary as required	Foreman and Environmental Coordinator	Daily

Monitoring Details	Area	Record	Responsibility	Frequency
levels in dust monitoring gauges				
Dust deposition monitoring	Dust Monitoring Gauge Sites (Refer to Table 8 for locations)	Laboratory results	Environmental Coordinator	Monthly
Check mobile plant exhaust emissions are satisfactory Plant with excessive exhaust emissions i.e. visible exhaust emissions for >10 seconds is prevented from coming to site.	Not applicable	Mobile plant inspection check	Foreman	Prior to each mobilisation

7.4.1. Dust Monitoring Method and Frequency

Dust will be monitored using gravimetric Dust Monitoring Gauges (DMG) during construction to assess compliance with the criteria detailed in Table 2. Dust will be monitored monthly.

7.4.2. Background Dust Monitoring

Dust deposition gauge monitoring will begin prior to the commencement of construction activities in the subject area, to determine existing background dust levels. Dust deposition monitoring will continue during construction of the project until disturbed areas in the subject area have been stabilised.

7.4.3. Dust Monitoring Locations

One DMG location (DMG1) has been selected near potential dust sensitive receivers and potentially high dust generating activities. One additional DMG location has been selected as a 'control' (DMG CONTROL). The control is located away from the influence of project related activities for the purposes of monitoring and evaluating meteorological and other non-project related variances in ambient dust levels.

Refer to Table 8 for the proposed location and rationale for the DMGs associated with the project. The locations of the DMGs are shown in Figure 2.

The precise location (eastings and northings) of the DMGs will be subject to agreement with landowners where relevant.

All DMGs will be sited in the field in accordance with AS 3580.1.1:2016 Methods for sampling and analysis of ambient air: Part 1.1: Guide to siting air monitoring equipment.

Additional DMG(s) may be installed along the alignment on an as-needs basis when there is evidence that current dust mitigation measures are not effective, or in response to complaints.

Table 8: Indicative Dust Monitoring Gauge Locations

DMG No.	Location	Reason
DMG1	Compound C2 Warwick Farm Recreation Reserve	To monitor potential dust impacts on residential houses, commercial receivers and the nearby reserves and Lawrence Hargrave School from

DMG No.	Location	Reason
		construction activities e.g. earthworks and site compound activities.
DMG CONTROL	Outside the project boundary	Control - away from the influence of the project

7.4.4. Procedures to identify and implement additional mitigation measures where results of monitoring are unsatisfactory

Implementation of the mitigation measures listed in Table 6 will ensure air quality impacts are minimised during construction. In the event that complaints about dust and/or the air quality are received or an exceedance of deposited dust criteria provided in Table 2 has been identified through monitoring, site inspections or audits, Fulton Hogan will implement the following procedure:

- The Environmental Manager will investigate the issue to determine possible causes of the non-conformance and develop appropriate mitigation measures. Depending on the outcome of this investigation, the Environmental Manager, in consultation with the wider construction team, might recommend modifications to the construction methods used
- Where investigation confirmed clear and unambiguous dust impact resulting from the construction of the project, the Environmental Manager, in consultation with the project team, will identify additional mitigation measures.

It is the responsibility of the relevant Foreman to ensure that the identified additional mitigation measures are implemented.

An ARTC Pollution Incident report will be completed for the incident as outlined in Chapter 7 of the CEMP. Non-conformances will be reported and notification undertaken in accordance with Chapter 10 of the CEMP.

Figure 2: Dust Monitoring Gauge Locations

7.5. Auditing

Auditing (both internal and external) will be undertaken to assess the effectiveness of environmental mitigation measures, compliance with this AQMP, ARTC specifications and other relevant approvals, permits and licences. Auditing requirements are detailed in Section 8.4 of the CEMP.

7.6. Reporting

General reporting requirements and responsibilities are documented in Chapter 9 of the CEMP.

7.7. Non-conformances

Non-conformances will be dealt with and documented in accordance with Chapter 10 of the CEMP.

8. Review and Improvement of AQMP

The AQMP will be reviewed to ensure compliance with legislative requirements and its suitability and effectiveness for the project.

The review may be in the form of:

- A formal management review
- A second party audit, and/or
- An inclusion as a separate item at a site meeting.

The Environmental Manager may review and update the AQMP more regularly where:

- Significant changes in construction activities occur
- Where targets are not being achieved, or
- In response to audits and non-conformance reports.

Any changes to the AQMP will be approved by the ER and made in accordance with the process outlined in Section 1.6 of the CEMP.