



Liddell Decoupling Works Air Quality Management Plan

Revision: Rev B

AGLM

Liddell Decoupling Environmental Management Strategy

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Acronyms and abbreviations

Acronym or abbreviation	Description
AQMP	Air Quality Management Plan
BAW	Bayswater Ancillary Works
CEMP	Construction Environmental Management Plan
CO	Carbon monoxide
DECC	Department of Environment, Climate Change and Water
DPE	Department of Planning and Environment
EMS	Environmental Management Strategy
EPA	Environment Protection Authority
EPL	Environment Protection Licence
GWh	Gigawatt hours
MW	Megawatt
NO _x	Nitrous oxides
PM _x	Particulate matter
SO _x	Sulphur oxides
VOC's	Volatile organic compounds

1. Introduction

1.1 Context

This Air Quality Management Plan (AQMP) has been developed to address the Development Consent Condition C1(e)(i) issued for the Project by the Planning Secretary of the NSW Department of Planning and Environment (DPE). This condition requires a subplan to manage the environmental impacts as a result of construction. All relevant conditions are outlined in Table 1-1.

Table 1-1. Air Quality – Conditions of Approval

Condition	Requirement	AQMP reference
C1	Prior to commencing construction, the Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must include a subplan on air quality management	N/A
B15	The Applicant must take all reasonable and feasible steps to: <ul style="list-style-type: none"> (a) Minimise odour, fume and dust emission of the development (b) Eliminate or minimise the risk of spontaneous combustion (c) Minimise to the greatest extent practicable, dust generating surfaces exposed on site 	Section 4.2

1.2 Purpose and scope

The purpose of this AQMP is to:

- Identify the potential impacts of the Project construction on the local air quality environment
- Detail the controls to be implemented to minimise construction air quality impacts
- Maintain compliance with the conditions of the development consent, environmental protection licence (EPL), and legislation relating to air quality.

Due to the nature of the activities undertaken during construction for this stage of project development, this plan addresses dust and vehicle emissions.

1.3 Project Description

1.3.1 Project Overview

AGLM are progressing plans to facilitate the efficient, safe and reliable continuation of electricity generating works from Bayswater and Liddell. The Project would consist of the following:

- **Decoupling works:** Alternative network connection arrangements for the Liddell 33 Kilovolt (kV) switching station that provides electricity to infrastructure required for the ongoing operation of Bayswater and associated ancillary infrastructure and potential third-party industrial energy user
- **The Battery:** A grid connected Battery Energy Storage System with capacity of up to 500 megawatt (MW) and 2 GWh
- **Bayswater Ancillary Works (BAW):** Works associated with Bayswater which may include upgrades to ancillary infrastructure such as pumps, pipelines, conveyor systems, roads and assets to enable maintenance, repairs, replacement or expansion
- **Consolidated consents:** A modern consolidated consent for the continued operation of Bayswater through the voluntary surrender and consolidation into this application of various existing development approvals required for the ongoing operation of AGLM assets.

1.3.2 Decoupling works

The key construction and decommissioning elements for the decoupling works of the Project addressed in this AQMP include:

- Establishment of new 330 kV / 33 kV transformer compounds adjacent to the Liddell switchyard. The 33 kV / 330 kV transformers are expected to be around 7 metres in height
- Installation of new switch/control room building/s, and equipment near the existing Liddell transition point inclusive of auxiliary supplies
- Installation of new 33 kV cables to connect the 330 kV / 33 kV station transformers to the existing 730 and 731 33 kV feeders to the new 33 kV switch room
- Connection to the Liddell switchyard.

The following works may also be required within the Liddell switchyard and are covered in this AQMP:

- 330 kV tie ins
- Removal of existing Liddell station transformer 330 kV landing spans
- Earth grid tie-in to the earth grid of the 330 kV /33 kV transformer compounds
- Replacement of protection panel equipment, installation and proofing of new rerouted protection and control cables
- Commissioning works.

This AQMP addresses only the Decoupling Works stage of the project, which will be progressed first in a staged approach to the project. The Decoupling Works are required to be completed first to provide an alternative network connection arrangement for the Liddell 33 kV switching station, which provides electricity to infrastructure required for the ongoing operation of the Bayswater Power Station (Bayswater). The decoupling works will allow for the shutdown and demolition of the Liddell Power Station, without disrupting operations at Bayswater.

2. Regulatory Requirements

2.1 Relevant legislation, guidelines, and conditions

All legislation relevant to the AQMP will be included in the Environmental Management Strategy (EMS). The main guidelines, standards and policies relevant to this AQMP include:

- **NSW Protection of the Environment Operations Act 1997 (POEO Act)**
 - The POEO Act is the primary piece of legislation for the regulation of potential pollution impacts associated with Scheduled operations or activities in NSW. Scheduled activities are those defined in Schedule 1 of the POEO Act. Liddell and Bayswater are operated under EPL 2122. EPL conditions are outlined in Section 2.1.1 below.
- **POEO Clean Air Regulation, 2021**
 - The POEO Clean Air Regulation contains provisions for the regulation of emissions to air from wood heaters, open burning, motor vehicles, fuels and industry.
- **Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW environment Protection Authority (EPA), 2016)**
 - The Approved Methods (EPA, 2016) was published by the EPA and outlines the approach to be applied for the modelling and assessment of air pollutants from stationary sources in NSW. The air pollutants most relevant to the Project are particulate matter emissions from excavation works and material handling, transport and processing activities; as well as from wind erosion of stored materials and exposed surfaces.
- **Approved Methods for Sampling and Analysis of Air Pollutants in NSW, (NSW Department of Environment and Conservation (DEC), 2005).**
 - The Approved Methods provides guidance for the monitoring and analysis of air pollutants in NSW.

The Minister's Conditions of Approval for the Project, relevant to the AQMP, are listed in Table 1-1.

2.1.1 Environment Protection Licence – POEO Act 1997

Liddell is operated under EPL 2122. The contractor must ensure that all works are conducted in accordance with the conditions of this licence.

The EPL conditions regarding mitigation and management of odour and dust from operations are listed in Table 2-1. It is expected that these conditions would also apply to the Project.

Table 2-1: EPL 2122 air quality requirements

Condition Number	Details
L5	<p>L6.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the POEO Act.</p> <p>Note: Section 129 of the POEO Act, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant EPL as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.</p>
O3	<p>O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.</p> <p>O3.2 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.</p> <p>O3.3 Trucks entering and leaving the premises that are carrying loads of dust generating materials must be covered at all times, except during loading and unloading.</p>

3. Existing Conditions

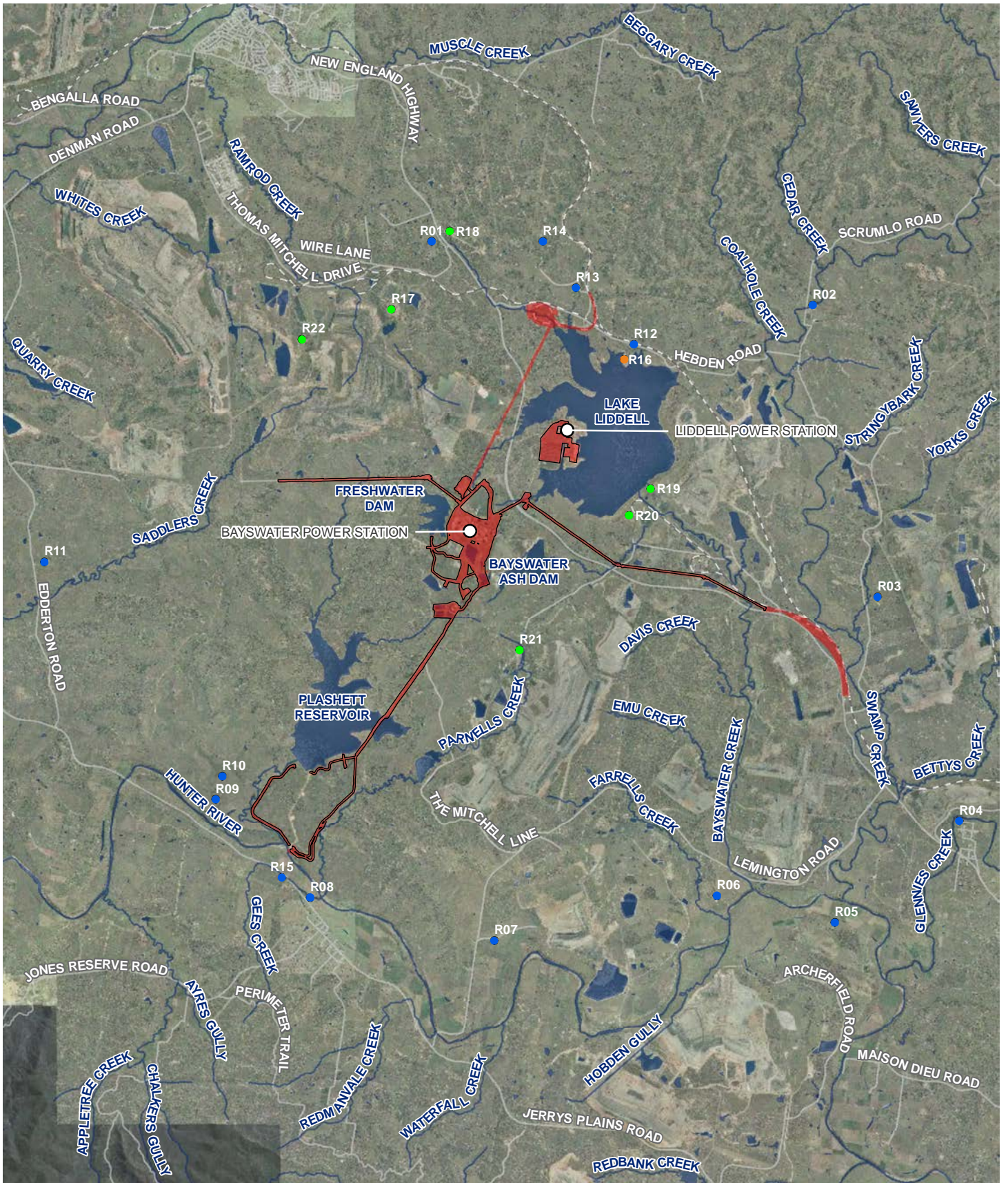
3.1 Sensitive receptors

The Project site is located entirely within the AGLM landholding, with Decoupling works generally being undertaken near the Liddell power station on previously disturbed operational lands no longer required for Liddell operations. The area is dominated by industrial activity including mining and power generation, with large-scale infrastructure being the predominant surrounding land use.










Social infrastructure and sensitive receivers are limited in the locality of the Project, with the closest sensitive receiver to the Decoupling work areas being the Lake Liddell Recreation Area approximately 2km to the north. There are 20 sensitive receivers identified within the vicinity of the project, including 15 residential receivers, listed in Table 3-1 and shown in Figure 3-1.

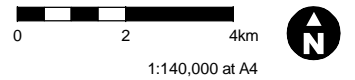
Table 3-1: Sensitive Receptor Locations

Receiver ID	X co-ordinate (UTM MGA Zone 56)	Y co-ordinate (UTM MGA Zone 56)	Approximate orientation from the Project	Approximate distance from the nearest physical works area of the Project (m)
RR01	306177	6421554	North	6,300
RR02	316337	6419837	Northeast	7,800
RR03	318041	6411978	East	3,000
RR04	320245	6405818	Southeast	8,000
RR05	316832	6403296	Southeast	8,800
RR06	313729	6403903	Southeast	8,100
RR07	307735	6402915	South	5,300
RR08	302782	6404017	South	1,100
RR09	300275	6406687	Southwest	1,000
RR10	300383	6407252	Southwest	1,100
RR11	295636	6412963	West	6,800
RR12	311493	6418878	Northeast	2,700
RR13	309979	6420335	Northeast	3,500
RR14	309141	6421575	North	4,700
RR15	302022	6404606	South	700



Legend

- | | | |
|---|--|---|
|  Development site | Sensitive Receivers |  Railway |
|  Project area |  Industrial |  Road |
| |  Passive Recreation |  Waterway |
| |  Residential |  Waterbody |



1:140,000 at A4

Data sources

Jacobs 2021
AGL 2020
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Service and Innovation Aug 2020

Imagery:
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GDA94 MGA56



Figure 3 - 1 Air quality - sensitive receivers around the Project

3.2 Meteorological Conditions

The meteorological and ambient air quality data collected at monitors operated by AGLM, as well as a number of other local industrial operators and the Department of Planning and Environment were reviewed to identify representative typical local meteorological conditions; these conditions showed annual prevailing winds blowing from the southeast and northwest.

4. Air Quality Impact and Management

4.1 Dust and vehicle emissions during construction

Construction activities for the Project may have temporary, localised air quality effects due to dust and engine exhaust emissions from vehicles and machinery. It is expected that these impacts will not result in unacceptable changes in air quality.

Dust and vehicle emissions from construction activities are from a variety of sources including site clearing, materials excavation, handling, transport and placement, as well as from wind erosion of stored materials and exposed surfaces. These emissions mainly comprise of particulate matter in the form of suspended particulates, particulates less than 10 microns (PM₁₀) and 2.5 microns (PM_{2.5}).

4.2 Impacts and controls

Potential air quality impacts due to construction and control measures are outlined in Table 4-1 These control measures are to be used to reduce impacts to human health and the environment.

Two categories of controls are identified:

- Standard controls – to be used throughout construction where applicable
- Controls for adverse meteorological conditions – to be applied when wind speeds are in excess of 18 km/hr (5 m/s), which has the potential to generate excessive dust.

Table 4-1. Air Quality Impacts and Controls

Potential cause and impacts	Control	Use
Training		
Lack of training and awareness could result in personnel not applying appropriate controls that could result in excessive dust generation that may have impacts to human health and /or flora and fauna	All construction personnel shall be instructed through the site-specific induction or toolbox process with regards to the importance of reducing dust generation during construction activities.	Standard
Earthworks, soil and fill movement		
Dispersion of particulate matter (PM _{2.5} and PM ₁₀) in the air resulting in reduced air quality that may impact the health of Project personnel on site, or at sensitive receptors near the site Impacts to flora and fauna from dust fallout and deposition Reduced amenity at sensitive receptors from dust fall out and deposition	A Soil and Erosion Management Plan shall be prepared as part of the CEMP.	Standard
	Source specific control measures shall be routinely implemented (e.g. water spraying roads for dust suppression of traffic movements)	Standard
	Water carts will operate across the Project during all construction activities that have the potential to produce dust	Standard
	Regular visual dust inspections of work areas to determine if additional dust suppression controls are required	Standard
	All material transported to the Project (including fill materials) will be covered during transport, except during loading and unloading	Standard
	Stockpile heights will have maximum heights designed to reduce potential wind mobilisation and transport of materials	Standard

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Potential cause and impacts	Control	Use
	Stockpiles of soils across the project will be managed to reduce dust emission including spraying with water or covering	Consider for adverse meteorological conditions
	Ceasing dust generating works should be considered during high winds	Consider for adverse meteorological conditions
Ground disturbance by vehicular movements and heavy plant machinery		
Dispersion of particulate matter (PM _{2.5} and PM ₁₀) in the air resulting in reduced air quality that may impact the health of Project personnel on site, or at sensitive receptors	Speed restrictions and signage is to be put in place	Standard
	Wash down facilities will be made available prior to vehicles leaving site to minimise mud and silt transfer offsite. Further measures may also be included to reduce the impact of mud and silt such as a rattle grid.	Standard
	Haul roads and hardstand areas will be treated with water, the amount of water to be increased/decreased as required by the use	Standard
Vehicle and heavy equipment emissions		
Emissions of CO, NO _x , SO _x , PM, and VOC's released from combustion sources including earthmoving equipment, haul trucks, and site vehicles dispersed within Project site or at sensitive receptors that have an impact on human health	Source emission reduction controls will be prioritised, such as minimising haul distances and traffic reduction controls	Standard
	All construction and maintenance equipment and vehicles are to be operated and maintained to the manufacturer's specifications, and be regularly service to minimise exhaust emissions	Standard
	Plant and equipment should be maintained so visible smoke is not emitted for a period greater than: <ul style="list-style-type: none"> ▪ 5 consecutive seconds where plant is not registered for use on public roads, and ▪ 10 consecutive seconds where plant is registered for use on public roads 	Standard
	Engines and equipment should be switched off when not in use	Standard
	Where reasonable and feasible, low emission plant and equipment should be adopted and used on site	Standard
Odour emissions		
Odour emissions from Project cross site boundaries, resulting in a complaint or non-compliance	In the event excavated material is uncovered that has the potential to produce an offensive odour and needs to remain on site, stockpiles should be stored as far from sensitive receivers as feasibly possible	Standard
	Where required, odorous stockpiles should be covered by a physical barrier (e.g. tarp) to suppress the odour	Standard

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Potential cause and impacts	Control	Use
	Odorous stockpiles will not be located close to Project boundaries.	Standard
	If odour cannot suitably be addressed by a physical barrier, an occupational hygienist should be consulted to advise on the use of odour suppressants on the stockpiles	Standard
Other impacts		
Fugitive emissions from stored chemicals have an impact on human health	Limit the quantity of chemical products stored at the site to the extent practical	Standard
	Ensure that all storage tanks are fitted with the appropriate controls in line with the POEO (Clean Air) Regulation 2021	Standard
Cumulative impacts of dust and emissions generation due to the Decoupling works construction and the Bayswater WOAOW project development occurring at the same time	Activities will be coordinated between the Decoupling works and the Bayswater WOAOW Project to limit the potential for cumulative dust impacts where possible	Standard
Reporting		
Lack of reporting of complaints or incidents could result in non-compliance and inability to manage dust generating activities	All complaints/incidents regarding dust generation shall be reported to the Site Superintendent, Construction Project Manager and to the AGLM Environment Manager	Standard
	Environmental Incident reports shall be completed and forwarded to the Project Manager, who should work with the Principal Contractor to improve processes to reduce or eliminate dust generation at the Project site	Standard

4.3 Response Plan

Contingency measures are to be implemented during periods of high particulate matter concentrations or adverse meteorological conditions. These measures include modification or ceasing of operations as required, as outlined in the Trigger Action Response Plan (TARP).

TARP Level	Normal	Level 1	Level 2
Complaint	No dust or odour complaint	Dust or odour complaint (unvalidated)	Dust or odour complaint (validated)
Meteorological Conditions	Principal Contractor to review wind speed forecast at Daily Pre-Start Meeting <ul style="list-style-type: none"> ▪ Wind speed <18km/hr 	Principal Contractor to review wind speed forecast at Daily Pre-Start Meeting <ul style="list-style-type: none"> ▪ Wind speed >18km/hr 	Principal Contractor to review wind speed forecast at Daily Pre-Start Meeting <ul style="list-style-type: none"> ▪ Wind speed forecast >36 km OR ▪ Wind speed forecast >18 km and wind direction from N or NW
Operational Activities	Normal operations	Continue operations and evaluate additional controls to suppress dust	Continue operations with additional controls to suppress dust, or modify operations
Trigger Actions Responses for Trigger Levels (Responsibilities)			
	Principal Contractor to: <ul style="list-style-type: none"> ▪ Maintain standard dust suppression activities ▪ Monitor operation 	Principal Contractor to: <ul style="list-style-type: none"> ▪ Evaluate effectiveness of controls throughout activity ▪ Plan and execute remedial actions as required: <ul style="list-style-type: none"> - Additional watering - Re-locating activities ▪ Conduct visual inspection to identify dust and/or air emission generating activities ▪ Investigate complaint, taking into consideration activity, meteorological conditions, and 	Principal Contractor to: <ul style="list-style-type: none"> ▪ Maintain and evaluate effectiveness of controls throughout activity ▪ Plan and execute remedial actions as required: <ul style="list-style-type: none"> - Additional watering - Re-locating activities - Reduced activity ▪ Conduct visual inspection to identify dust and/or air emission generating activities ▪ Investigate complaint, taking into consideration activity,

		<p>visual observation of impact to validate complaint</p> <ul style="list-style-type: none"> ▪ Provide verbal response to complaint ▪ Record in complaints register 	<p>meteorological conditions, and visual observation of impact to validate complaint</p> <ul style="list-style-type: none"> ▪ Provide verbal response to complaint ▪ Record in complaints register and report to Project Manager ▪ Communicate lessons learned to Environment and Project Team
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Figure 4-1: Trigger, Action and Response Plan for Dust Emissions

5. Compliance Management

5.1 Roles and Responsibilities

Roles and responsibilities are outlined in Section 7.3 of the EMS.

5.2 Inspections

Inspections of the project site will occur as outlined in Section 7.6 of the EMS.

5.3 Monitoring and Reporting

Monitoring requirements are listed in Appendix B of the EMS.

5.4 Incidents and Complaints

Incident management will be managed in accordance with the process outlined in Section 7.5 of the EMS.

Complaints and enquiries will be managed in accordance with the process outlined in Section 6.3 of the EMS.

5.5 Document review and update

It is a requirement of the Environmental Management Strategy that all associated plans, studies and strategies are reviewed and updated within three months of the following events:

- The submission of an environmental incident report
- The submission of an audit report
- The approval of any modification to the conditions of the Development Consent
- A direction of the Secretary DPE.

