

ULAN
COAL

GLENCORE



Air Quality and Greenhouse Gas Management Plan

Plan

In accordance with Condition 4, Schedule 5 of PA08_0184 this Plan has been subject to updates and revisions submitted to the NSW Department of Planning, Industry and Environment (DPE) (See Change Information Section 7.3). The Effective date of this document represents the latest acknowledgement from DPE that this Plan has been prepared to the satisfaction of the Director-General.

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Table of Contents

1	Commitment and Policy.....	5
1.1	Introduction	5
1.2	Purpose	6
1.3	Scope.....	6
1.4	Management Plan Structure.....	6
2.1	Project Approval Requirements.....	9
2.2	EPL 394.....	13
2.3	Legislative Requirements.....	13
2.3.1	Air Quality	13
2.3.2	Greenhouse Gas.....	14
2.4	Relevant Guidelines and Protocols	14
2.5	Stakeholder Consultation	14
3	Air Quality Management.....	16
3.1	Implementation	16
3.1.1	Objectives.....	16
3.1.2	Baseline Data	16
3.1.2.1	Air Quality Impact Assessment (EA)	17
3.1.2.2	Project Specific Emissions	18
3.1.2.3	Cumulative Emissions.....	18
3.1.3	Air Quality Impact Assessment Criteria	19
3.1.3.1	Dust Concentration	19
3.1.3.2	Land Acquisition Criteria	22
3.1.4	Air Quality Management Controls	22
3.1.4.1	Dust Management Controls	22
3.1.5	Offensive Odours	28
3.1.5.1	Spontaneous Combustion	28
3.1.5.2	Other offensive odours.....	29
3.1.5.3	Fume	29
3.1.6	Air Quality Management.....	30
3.1.6.1	Meteorological Monitoring	30
3.1.6.2	Air Quality Surveillance	30
3.1.6.3	Active Management – Current Practices.....	31
3.1.7	Continuous Improvement	31
3.1.7.1	Best Practice Air Quality Mitigation Measures	31
3.1.7.2	Active Air Quality Management	32
3.1.8	Change Management.....	32
3.1.9	Training	32
3.2	Measurement and Evaluation	33

3.2.1	Air Quality Monitoring Program	33
3.2.1.1	High Volume Air Samplers	33
3.2.1.2	Real-Time Dust Monitoring	33
3.2.1.3	Meteorological Monitoring	34
3.2.1.4	Compliance Assessment Protocol	34
3.2.1.5	Independent Review and Land Acquisition Process.....	35
3.2.2	Reporting.....	35
3.2.2.1	Internal Reporting	36
3.2.2.2	Incident Reporting.....	37
3.2.2.3	External Reporting.....	37
3.2.2.4	Corrective Action	37
3.2.2.5	Monitoring Records.....	38
3.2.3	Community Complaints	38
4	Greenhouse Management	38
4.1	Implementation	38
4.1.1	Objectives.....	38
4.1.2	Baseline Data	39
4.1.3	Greenhouse Gas Impact Assessment Criteria.....	41
4.1.3.1	National Greenhouse and Energy Reporting System	41
4.1.3.2	Greenhouse Gas Performance Measures	41
4.1.4	Greenhouse Gas Management Controls	42
4.1.4.1	Design Controls.....	42
4.1.4.2	Procurement.....	43
4.1.4.3	Operational Controls	43
4.1.4.4	Prioritising Energy and GHG Management Controls.....	44
4.1.4.5	Continuous Improvement	45
4.1.4.6	Scope 3 Greenhouse Gas.....	45
4.2	Measurement and Evaluation	45
4.2.1	Greenhouse Gas Monitoring Program.....	45
4.2.1.1	Monitoring Standards.....	46
4.2.1.2	Process Maps.....	47
4.2.1.3	Monitoring Records.....	47
4.2.2	Reporting.....	47
4.2.2.1	Internal	47
4.2.2.2	External.....	48
4.2.2.3	Management of Unpredicted Emissions	48
4.2.2.4	Management of Non-Compliance	48
5	Review and Improvement.....	49
6	Accountabilities.....	49
7	Document Information	55
7.1	Definitions.....	55

7.2	Reference Information.....	57
7.3	Change Information	58
Appendix A - DPE Management Plan Approval Correspondence		63
Appendix B - UCMPL Dust and Weather TARP		64

Tables

Table 3-1	Long and Short Term Impact Assessment Criteria for Particulate Matter	19
Table 3-2	Long Term Acquisition Criteria for Particulate Matter	22
Table 3-3	Short Term Acquisition Criteria for Particulate Matter	22
Table 3-4	Long Term Acquisition Criteria for Deposited Dust	22
Table 3-5	Dust Management Controls.....	23
Table 3-6	Treatment of Roads	25
Table 3-7	Operation Specific Dust Controls.....	28
Table 3-8	Air Quality Monitoring Frequency	33
Table 3-9	Reporting Requirements.....	35
Table 3-10	Corrective Actions.....	37
Table 4-1	- UCMPL Scope 1 Emissions Annual Average (SEE, 2009)	39
Table 4-2	A framework for prioritising greenhouse gas management options	45
Table 4-3	Greenhouse gas and energy use monitoring systems.....	46
Table 4-4	Energy production monitoring systems.....	46
Table 4-5	GCP reporting intervals.....	47
Table 7-1	Definitions	55
Table 7-2	Reference information.....	57
Table 7-3	Change information	58
Table 7-4	Visual Dust Triggers and Associated Actions	65

Figures

Figure 1-1	Location of the Ulan Mine Complex	7
Figure 1-2	Ulan Coal Complex Operations.....	8
Figure 3-1	Monitoring Locations.....	21

1 Commitment and Policy

1.1 Introduction

The Ulan Mine Complex is situated in the central west of New South Wales. It is located in the Mid-Western Regional Council (MWRC) Local Government Area (LGA) near the village of Ulan; approximately 38 kilometres north-northeast of Mudgee and 19 kilometres northeast of Gulgong (**Figure 1.1**). Ulan Coal Mines Pty Limited (UCMPL) operates the mine, managed by Glencore Coal Assets Australia (GCAA).

UCMPL owns or has long term leases over the majority of land within the project area that will be subject to mining activities and required for surface facilities. The area is primarily surrounded by rural landholdings, native bushland and primary industries including agriculture, forestry, mining (including other coal mining operations) and extractive industries. The UCMPL landholdings are located within the headwaters of the Goulburn and Talbragar River catchment areas.

Project Approval (PA 08_0184) was issued by NSW Planning, Industry and Environment (DPE), on 15 November 2010 for continued operations. PA 08_0184 authorises current and proposed mining of the Ulan Mine Complex for the next 21 years, and production of up to 20 Mtpa (million tonnes per annum) of product coal. The approval provides for an open cut, Ulan West (UWO) and Ulan Underground (UUG) mines to operate twenty-four hours a day, 7 days per week. Infrastructure and supporting operations include the Bobadeen Irrigation Scheme (BIS) and Bobadeen Basalt Quarry (**Figure 1.2**). The approval was modified as follows:

- Environmental Assessment: Ulan Coal Continued Operations North 1 Underground Mining Area, Minor Modification to Ulan Underground & Ulan West Mine Plans & Proposed Concrete Batching Plant (Umwelt, 2011) - (MOD1) approved 7 December 2011
- Land and Environment Court final orders issued on the 5 April 2012.
- Ulan West Mine Plan and Construction Blasting (Umwelt, 2012) – (MOD2) approved 29 May 2012
- Environmental Assessment: Ulan West Modification (southern extension) (Umwelt 2015) – (MOD 3) Approved 14 March 2016.
- Environmental Assessment: Ulan Continued Operations Project, Longwall Optimisation Project (Ecological, 2018) – (MOD 4), as modified by the Response to Submissions dated August, 2018, approved 17 July 2019. Modification 4 included conceptual changes to the approved mine plans at both UUG and UWO to enable longwall panels to be both lengthened and widened, providing access to an additional approximately 6.4 Mt ROM coal. This included extension of longwalls 30, 31, 32, 33 and longwalls W7 and W8, along with widening of longwall 33 at UUG and extension of longwalls 7 and 8 at UWO. MOD 4 also included the provision of additional surface infrastructure to support mining activities in the proposed Modification area, including the conceptual redesign of infrastructure and provision for access tracks, dewatering infrastructure (boreholes and shedding), powerlines and pipelines.
- Revision of Ulan West Operational Mine Plan – Modification 5 approved 7th August 2020. Modification 5 was a minor, administrative modification under section 4.55(1) of the Environmental Planning and Assessment Act 1979 to amend a misdescription of the approved Figures provided in Appendix 2 to 7 of PA 08_0184.
- MOD 7 was approved on 23 March 2022 which was an approval of an alternative offset site due to being unable to secure in perpetuity a 10ha portion of the Broken Back Conservation area.

MOD7 did not modify any aspects relevant to the Air Quality and Greenhouse Gas Management Plan.

The Air Quality and Greenhouse Gas Management Plan (AQGHGMP) for the project is provided to satisfy PA 08_0184¹

1.2 Purpose

The purpose of the Plan is to:

- provide a description of the measures to be implemented by UCMPL and its contractors to minimise and mitigate the potential for air quality and greenhouse gas impacts on the local community and the environment and comply with the relevant conditions of PA 08_0184 and Environment Protection Licence (EPL) 394;
- detail air quality and greenhouse gas monitoring;
- provide a mechanism for assessing air quality monitoring results against the relevant air quality impact assessment criteria and land acquisition criteria;
- address risks relating to air quality and greenhouse management identified in the Environment & Community Risk Register in accordance with Environmental Management Strategy (ULNCX-111515275- 870), and detail the necessary mitigation and management measures; and
- align operating philosophy with the GCAA Health Safety Environment and Community (HSEC) Framework.

1.3 Scope

The scope of the Plan applies to the Ulan Mine Complex's existing and future operations and within land owned or managed by UCMPL (see Figure 1.2). The Plan applies to UCMPL employees and contractors.

1.4 Management Plan Structure

In order to identify specific AQGHGMP requirements and where they are satisfied within this Plan, the Implementation, Measurement and Evaluation sections of this Plan been separated into two parts:

- **Section 3** provides the requirements and controls for air quality management; and
- **Section 4** addresses the greenhouse gas management requirements.

¹ Schedule 3, Condition 22 and Schedule 5, Condition 2

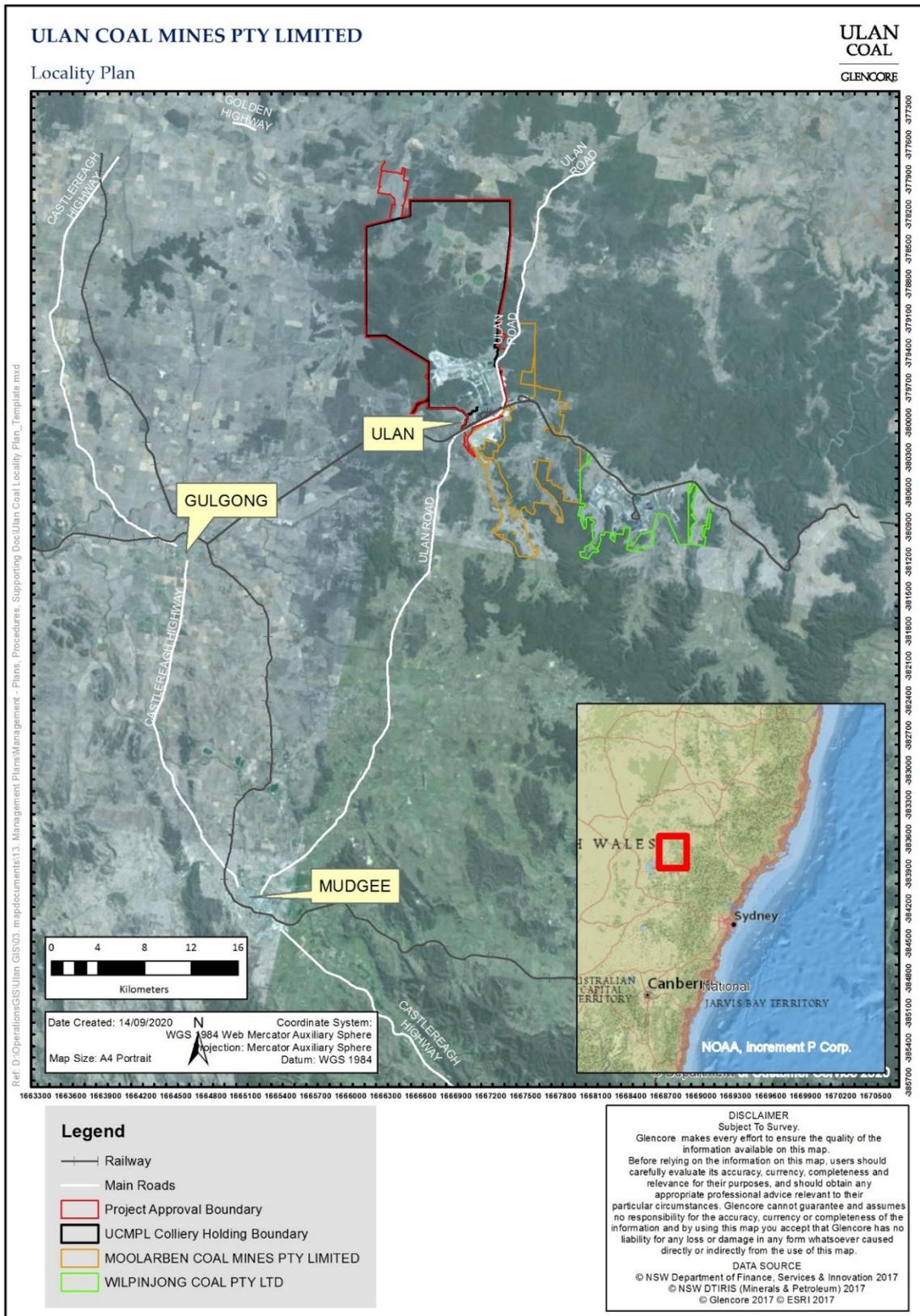


Figure 1-1 Location of the Ulan Mine Complex

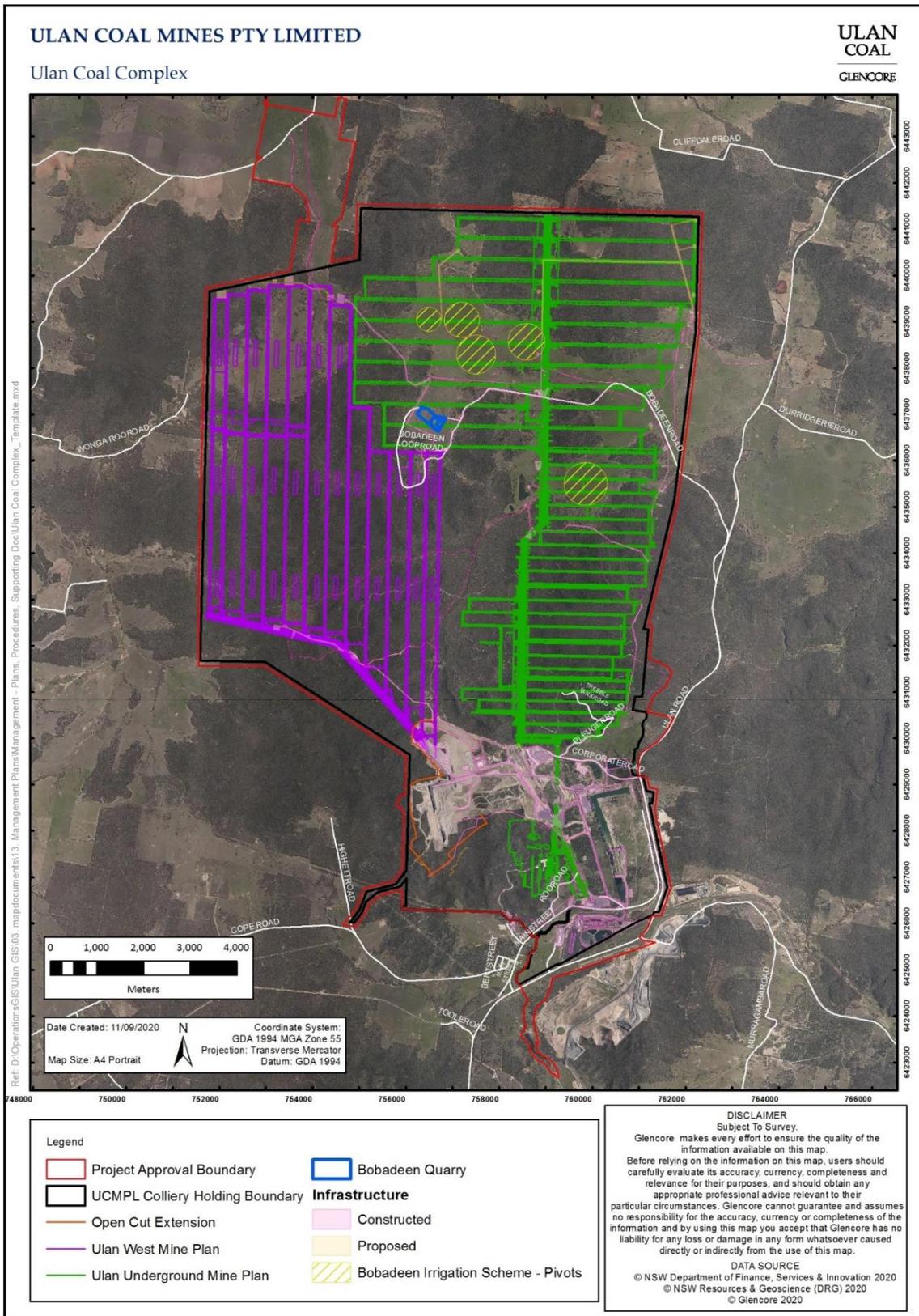


Figure 1-2 Ulan Coal Complex Operations

2.1 Project Approval Requirements

Relevant conditions from the PA 08_0184 and where the conditions are addressed in this document are listed in **Table 2.1** below.

Table 2.1 Project Approval Conditions (08_0184)

Schedule	Project Approval Conditions	Section of this document																							
3	<p>Odour</p> <p>17. The Applicant must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.</p>	Sections 3.1.5																							
3	<p>Greenhouse Gas Emissions</p> <p>18. The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site including the release of Scope 2 greenhouse gas emissions attributable to operations at the site and which are under the control of the Applicant, in each case to the satisfaction of the Secretary.</p>	Section 4.1.4																							
3	<p>Air Quality Criteria</p> <p>19. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the project do not exceed the criteria listed in Tables 8, 9 and 10 at any residence on privately owned land or on more than 25 percent of any privately owned land.</p> <p><i>Table 8: Long term criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>^dCriterion</th> </tr> </thead> <tbody> <tr> <td>Total suspended particulate (TSP) matter</td> <td>Annual</td> <td>^a90 µg/m³</td> </tr> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>Annual</td> <td>^a30 µg/m³</td> </tr> </tbody> </table> <p><i>Table 9: Short term criterion for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>^d Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>24 hour</td> <td>^a 50 µg/m³</td> </tr> </tbody> </table> <p><i>Table 10: Long term criteria for deposited dust</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Maximum increase in deposited dust level</th> <th>Maximum total¹ deposited dust level</th> </tr> </thead> <tbody> <tr> <td>^cDeposited dust</td> <td>Annual</td> <td>^b2 g/m²/month</td> <td>^a4 g/m²/month</td> </tr> </tbody> </table> <p><i>Notes for Tables 8 -10:</i></p> <ul style="list-style-type: none"> ^aTotal impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources); ^b Incremental impact (i.e. incremental increase in concentrations due to the project on its own); ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agree to by the Secretary in consultation with EPA. 	Pollutant	Averaging period	^d Criterion	Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³	Pollutant	Averaging period	^d Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total ¹ deposited dust level	^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month	Section 3.1.3
Pollutant	Averaging period	^d Criterion																							
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³																							
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³																							
Pollutant	Averaging period	^d Criterion																							
Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³																							
Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total ¹ deposited dust level																						
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month																						
3	<p>Air Quality Acquisition Criteria</p> <p>20. If the particulate matter emissions generated by the project exceed the criteria in Tables 11, 12 and 13 at any residence on privately owned land or on more than 25 percent of any privately owned land, then upon receiving a written request for acquisition from the landowner the Applicant must acquire the land in accordance with the procedures in Conditions 6-7 of Schedule 4.</p>	Sections 3.1.3.2																							

Schedule	Project Approval Conditions	Section of this document																										
	<p><i>Table 11: Long term acquisition criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>^d Criterion</th> </tr> </thead> <tbody> <tr> <td>Total suspended particulate (TSP) matter</td> <td>Annual</td> <td>^a90 µg/m³</td> </tr> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>Annual</td> <td>^a30 µg/m³</td> </tr> </tbody> </table> <p><i>Table 12: Short term acquisition criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>^d Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>24 hour</td> <td>^a150 µg/m³</td> </tr> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>24 hour</td> <td>^b50 µg/m³</td> </tr> </tbody> </table> <p><i>Table 13: Long term acquisition criteria for deposited dust</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Maximum increase in deposited dust level</th> <th>Maximum total deposited dust level</th> </tr> </thead> <tbody> <tr> <td>^cDeposited dust</td> <td>Annual</td> <td>^b2 g/m²/month</td> <td>^a4 g/m²/month</td> </tr> </tbody> </table> <p><i>Notes for Tables 11 - 13:</i></p> <ul style="list-style-type: none"> ^a Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources); ^b Incremental impact (i.e. incremental increase in concentrations due to the project on its own); ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agree to by the Secretary in consultation with EPA. 	Pollutant	Averaging period	^d Criterion	Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³	Pollutant	Averaging period	^d Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month	
Pollutant	Averaging period	^d Criterion																										
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³																										
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^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month																									
3	<p>Operating Conditions</p> <p>21. The Applicant must:</p> <ol style="list-style-type: none"> implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the project, including those generated by any spontaneous combustion on site, minimise any visible air pollution generated by the project; and regularly assess the real-time air quality monitoring and meteorological forecasting data, and relocate, modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent; and co-ordinate air quality management on site with the air quality management at the Moolarben and Wilpinjong mines to minimise the cumulative air quality impacts of the mines, <p>to the satisfaction of the Secretary.</p>	<p>Section 3.1.4 and 3.1.4.2, 3.1.4.3 and 3.1.4.4</p> <p>Section 3.1.4</p> <p>Section 3.1.6 and 3.2.1</p> <p>Sections 3.1.6.2 and 3.1.6.3</p>																										
3	<p>Air Quality and Greenhouse Gas Management Plan</p> <p>22. The Applicant must prepare and implement a detailed Air Quality & Greenhouse Gas Management Plan for the project to the satisfaction of the Secretary. This Plan must:</p> <ol style="list-style-type: none"> be prepared in consultation with EPA and Council, and submitted to the Secretary for approval within 3 months of the date of final Orders being made by the Land and Environment Court in proceedings No. 10998 of 2010; describe the measures that would be implemented to ensure compliance with conditions 17-21 of this schedule, including a real-time air quality management system that employs reactive and proactive mitigation measures; and include an air quality monitoring program that uses a combination of real-time monitors, high volume samplers and dust deposition gauges to evaluate the performance of the project, and includes a protocol for determining exceedances of the relevant conditions of this consent. <p>The Applicant must implement the plan as approved by the Secretary.</p>	<p>Entire Plan</p> <p>Section 2.5</p> <p>Sections 3.2.1.2 and 3.2.1.4</p> <p>Section 3.2.1</p> <p>3.1.1</p>																										
	<p><i>Note: The effectiveness of the Air Quality & Greenhouse Gas Management Plan is to be reviewed and audited in accordance with the requirements in Schedule 5. Following these reviews and audits, the plan is to be revised to ensure it remains up to date (see Condition 4 of Schedule 5).</i></p>																											

Schedule	Project Approval Conditions	Section of this document
3	<p>Meteorological Monitoring</p> <p>23. During the life of the project, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that:</p> <p>a) complies with the requirements in the <i>Approved Methods for Sampling of Air Pollutants in New South Wales</i> guideline; and</p> <p>b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the <i>NSW Industrial Noise Policy</i>.</p>	<p>Section 3.2.1.3</p> <p>Section 3.2.1.3</p>
5	<p>Management Plan Requirements</p> <p>2. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) a summary of baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits on performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; <p>(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> • impacts and environmental performance of the project; • effectiveness of any management measures (see c above); <p>(e) a contingency plan to manage any unpredicted impacts and their consequences;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the project over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and <p>(h) a protocol for periodic review of the plan.</p> <p><i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i></p>	<p>Section 3.1.2</p> <p>Sections 2.1, 0, 3.1.2, 3.2</p> <p>Sections 3.1.6 and 3.2</p> <p>Sections 3.2.2, 3.2.2.1</p> <p>Section 3.2.2.4</p> <p>Section 3.1.7</p> <p>Sections 3.2.2.2, 3.2.3, 3.2.2, 3.2.2.1 and 3.2.2.3</p> <p>Section 5</p>
5	<p>Revision of Strategies, Plans and Programs</p> <p>4. Within 3 months of:</p> <p>(a) the submission of an annual review under Condition 3 above;</p> <p>(b) the submission of an incident report under Condition 6 below;</p> <p>(c) the submission of an audit report under Condition 8 below; and</p> <p>(d) any modification to the conditions of this consent, (unless the conditions require otherwise),</p> <p>the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary.</p> <p>Where this review leads to revisions in any such document, then within 4 weeks of the review, unless the Secretary agrees otherwise, the revised document must be submitted to the Secretary for approval.</p> <p>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.</p>	<p>Section 5</p>
5	<p>Incident Notification and Reporting</p> <p>6. The Applicant must immediately notify the Department and any other relevant agencies after it becomes aware of an incident. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project number and name) and set out the location and nature of the incident.</p>	<p>Section 3.2.2</p>

Schedule	Project Approval Conditions	Section of this document
	<p>6A Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project number and name), set out the condition that the project is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.</p> <p><i>Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.</i></p>	Section 3.2.2
	<p>Appendix 9 – Statement of Commitments</p> <p>Air Quality</p>	
6.9.1	Measures to minimise dust emissions from the operation will be included in the project design such as enclosures on top of overland conveyors and spray systems for permanent coal stockpiles where practicable.	Section 3.1.4
6.9.2	The Project will minimise the total disturbance footprint and the area of untreated hardstand to the minimum practicable;	Sections 3.1.4
6.9.3	<p>UCMPL will continue to implement existing dust controls, including:</p> <ul style="list-style-type: none"> watering of active mining areas, active spoil emplacement areas and haul roads that are subject to frequent vehicle movements; all drill rigs are equipped with dust control systems and are regularly maintained for effective use; automatic sprays fitted to dump hopper and crushing plant to minimise dust from coal processing activities; topsoil stripping is preferentially undertaken when there is sufficient moisture content in the soil; minimising the area of disturbance by restricting vegetation clearing ahead of mining operations, rehabilitating mine spoil dumps as soon as practicable after mining and using existing facilities and infrastructure where possible; restricting blasting activities during adverse weather conditions. 	Section 3.1.4
6.9.4	UCMPL will continue to implement the current spontaneous combustion management system to address the coal's susceptibility to spontaneous combustion, which includes procedures for identifying potential sources of carbonaceous material with spontaneous combustible properties and methods for handling and disposing of these materials.	Section 3.1.4.2
	<p>Greenhouse Gas and Energy Assessment</p>	
6.13.1	UCMPL will continue to implement their existing greenhouse gas and energy management commitments as described in Section 5.12.	Section 4.1.4
6.13.2	UCMPL will investigate and implement where feasible GHG and energy management and mitigation initiatives during the design, operation and decommissioning of the Project.	Section 4.1.4 and Section 4.1.4.1
6.13.3	UCMPL will continue to monitor and seek to improve its energy and greenhouse gas performance against performance targets.	Sections 4.1.4 and 4.2.1
6.13.4	UCMPL will report its greenhouse and energy performance via legislative reporting requirements.	Section 4.2.2
	<p>Cumulative Impacts</p>	
6.16.8	UCMPL will continue to work with representatives from neighbouring mines to discuss and address issues of common concern in relation to management of cumulative impacts, in accordance with project approval requirements.	Section 3.1.2.3 and Section 3.1.6.3

2.2 EPL 394

EPL 394 condition P1.1 provides monitoring points for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air at the point, listed in the table below.

Table 2.2 Air Quality Monitoring Point Locations

EPA identification no.	Type of Monitoring Point	Location Description
15	High volume air sampler (HVAS)	HV1 at Flannery's
29	HVAS	HV3 at 331 Cope Road
30	PM10 Tapered Element Oscillating Microbalance (TEOM)	at 331 Cope Road
32	Meteorological station	Meteorological monitoring point at USO

Condition M2.2 specifies the monitoring of total suspended particulates, measured in micrograms per cubic metre, must be sampled every 6 days, consistent with sampling method AM-15 from the HVAS monitoring points and PM10 is to be measured in micrograms per cubic metre, continuously², consistent with sampling method AM-22.

Air quality criteria are not specified in EPL394.

Condition O3 provides requirements for management of Dust as follows:

- O3.1 All areas in or on the premises must be maintained in a condition that prevents or minimises the emission into the air of air pollutants (which includes dust).
- O3.2 Any activity in or on the premises must be carried out by such practicable means as to prevent or minimise the emission into the air of air pollutants (which includes dust).
- O3.3 Any plant in or on the premises must be operated by such practicable means as to prevent or minimise the emission into the air or air pollutants (which includes dust).

The controls implemented to meet the requirements of Condition O3 of EPL 394 are described in **Table 3-5**, **Table 3-6** and **Table 3-7**.

Should continuous monitoring equipment be unavailable or a period of time greater than 48 hours, UCMPL will notify the EPA to determine whether equivalent manual sampling, testing or estimation needs to be undertaken on daily basis at the monitoring point(s) as required by Condition M2.4 prior to the return to service of the monitoring equipment.

2.3 Legislative Requirements

2.3.1 Air Quality

UCMPL undertake air quality management in accordance with the policies, principles, regulations and guidelines contained in:

- *The Protection of the Environment Operations Act 1997 (PoEO Act);*
- *Environmental Planning and Assessment Act 1979 (EP&A Act);*
- *Australian Standard AS3580.14 Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications;*

² For the purposes of Condition M2.2, continuous monitoring is defined as uninterrupted monitoring that occurs over a specified timeframe. Continuous monitoring should only be interrupted during planned equipment maintenance.

- AS/NZS 3580.9.3 *Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – Total suspended particulate matter (TSP) High-volume sampler gravimeter method (AM-15)*;
- Australian Standard AS3580.9.8 *Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser*;
- NSW EPA, *Table of AM-coded methods for ambient air monitoring* December 2021;
- *The Protection of the Environment Operations (Clean Air) Regulation 2010*; and
- EPA publication *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (2007).

2.3.2 Greenhouse Gas

Greenhouse gas management is regulated by:

- the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) (and subsequent amendments), administered by the Clean Energy Regulator;
- the *National Greenhouse and Energy Reporting Regulations 2008*, administered by the Clean Energy Regulator;
- the *National Greenhouse and Energy Reporting (Measurement) Determination*, administered by the Clean Energy Regulator; and
- the *Energy and Utilities Administration Act 1987 Part 6A*, administered by the EPA

2.4 Relevant Guidelines and Protocols

The air quality section of the Plan has been developed in accordance with the relevant GCAA policies and protocols including:

- GCAA-625378177-10328 11.20 Statutory Approvals - NSW
- GCAA-625378177-10324 11.10 Air Quality Management Protocol;
- GCAA-625378177-4129 Exploration Management Standard; and
- GCAA-625378177-10274 Environmental Reporting Protocol.

The greenhouse gas section of the Plan has been developed in accordance with relevant GCAA policies and protocols including:

- GCAA-625378177-13662 GCAA NGER Reporting Protocol;
- GCAA-625378177-10274 Environmental Reporting Protocol; and
- GCAA-625378177-18413 11.08 Waste Management Protocol.

2.5 Stakeholder Consultation

An outline of the draft Plan was presented to DPE (Division of Resources and Geoscience), EPA, and Mid Western Regional Council (MWRC) during a site meeting on 23 March 2011. The content of the Plan was discussed, with EPA and the MWRC not requesting any additional information be included in this Plan. In addition to the meeting on 23 March 2011, a copy of the Plan was submitted to EPA and the MWRC concurrently with lodgement of the Plan to DPE on 31 March 2011³. Comments received from DPE in May 2011 were addressed as indicated in **Table 2.3** below. A second letter was sent to MWRC on 16 June 2011, requesting feedback on the Plan. A response was received from MWRC on 23 June 2011 advising that MWRC had no comment in relation to this Plan. No correspondence was

³ PA 08_0184 Schedule 3 Condition 22

received from EPA at the time, though they have advised, in October 2016 that they would not review and comment on version updates to the Plan. The Plan was resubmitted and was approved on 13 July 2011.

This Plan has been revised with minor changes and resubmitted to DPE for review following approval of Modification 4 in July 2019 and approval of Modification 5 in August 2020.

This Plan has been revised with minor changes following approval of Modification 7 on 23 March 2022 and completion of the Independent Environmental Audit in April 2022; and was submitted to the EPA and MWRC for review and feedback on 22 November 2022. MWRC responded on 29 November 2022, advising they had no comment in relation to this Plan. The EPA responded on 6 December 2022 advising they had no comment in relation to this Plan.

Detail on the revision and resubmissions of the Plan including approval dates are available in **Section 7.3**.

Table 2.3 Draft Air Quality and GHG Management Plan feedback from DPE

Department Issues	Where addressed
Figure 3.1 – it would be useful to include the Residence Numbers on the Figure (as indicated in the text of the plan and the EA);	Figure 3-1
Section 3.1.4.2 states that the data sharing agreement with Moolarben is in place. Section 3.1.4.15 states that it is being developed. Which is correct?	Section 3.1.6.3
Post Approval Review dated 9 May 2022 (MP08_0184-PA-81)	Throughout document and in change summary version 8.4 dated 20 June 2023.

3 Air Quality Management

3.1 Implementation

3.1.1 Objectives

The air quality management objectives of this Plan are to ensure that appropriate procedures and programs of work are in place to:

- ensure dust management measures are effective and implementable at Ulan Surface Operations (USO) to reduce the potential for impacts on ambient air quality, including source-specific dust controls and site-wide management systems and procedures;
- utilise automated systems for early identification of adverse meteorological conditions likely to result in dust impacts, and the triggering of timely 'high management actions' to reduce dust emissions during such periods, recognising that cumulative air quality is a key issue for the local community;
- maintain an air quality monitoring system which can assess the air quality impact on surrounding sensitive receivers and performance against PA 08_0184 and EPL 394 specific air quality impact assessment criteria;
- ensure awareness raising and training of employees to support effective and timely identification, reporting and mitigation of dust;
- manage air quality related community complaints in a timely and effective manner;
- detail the requirement for reporting air quality criteria exceedances to the relevant stakeholders;
- ensure that dust management is integrated into the entire life of mine, from mine planning to mine rehabilitation and closure; and
- implement all requirements to the satisfaction of the Secretary.

3.1.2 Baseline Data

Air quality monitoring has been undertaken on a regular basis from 1981 up until the present time, although several of the original monitoring locations have been modified over time in consultation with EPA or its predecessors.

Annual average calculations indicate dust deposition levels typically ranged between 0.6 and 7.7 g/m²/month in 1981; 0.9 and 3.1 g/m²/month in 1997; and 0.6 and 1.5 g/m²/month in 2007, demonstrating a decreasing trend since monitoring began. During 2010/2011, the average annual results indicate that depositional dust concentrations were generally lower at all dust gauges when compared to 2009/2010 reporting period. There were no sites that exceeded the annual average of 4 g/m²/month during the reporting period. Depositional Dust monitoring was removed from EPL394 by the EPA in October 2019.

Total Suspended Particulates (TSP) has been monitored by UCMPL using two high volume air samplers (HVAS) at two separate sites since 1983; "Rowan's Dam" and "Flannery's". The annual average TSP for the period up until September 2008 was 25.7 µg/m³ for Rowan's Dam and 24.6 µg/m³ for Flannery's. For the period November 2008 to December 2010 the average TSP was 29.2 µg/m³ for Rowan's Dam and 19 µg/m³ for Flannery's. During 2010/2011 there were no average annual TSP concentrations above the project specific criteria of 90 µg/m³. In addition there were no 24hr results greater than 90

$\mu\text{g}/\text{m}^3$. In October 2011, UCMPL installed an additional HVAS (HV3) at 331 Cope Road into the dust monitoring network, in accordance with AQMP. With the exception of the newly commissioned HVAS at Merlene (HV3), all existing HVAS units at Rowan's Dam and Flannery's had a 100% capture rate. The capture rate was improved on the previous year due to less unplanned power outages. The TSP results for 2010/2011 are consistent with Year 1 predictions provided in the air quality assessment within the 2009 EA.

UCMPL has monitored PM_{10} at the site since September 2006, using a Tapered Element Oscillating Microbalance (TEOM) monitor, which was installed adjacent to the USO administration building. The annual average PM_{10} for December 2006 to December 2007 was $20.6 \mu\text{g}/\text{m}^3$, and $18.7 \mu\text{g}/\text{m}^3$ for January 2008 to September 2008. During 2010/2011, the average annual PM_{10} concentrations did not exceed the project specific criteria of $30 \mu\text{g}/\text{m}^3$. In addition there were no 24 hr results greater than $50 \mu\text{g}/\text{m}^3$. The PM_{10} results for 2010/2011 are consistent with Year 1 predictions provided in the air quality assessment within the 2009 EA. A review of the historical PM_{10} annual averages provided in the 2009 EA, suggests a decreasing trend for PM_{10} concentrations during the 2010/2011 reporting period.

Further details of the ongoing air quality monitoring program are provided in **Section 3.2.1**

3.1.2.1 Air Quality Impact Assessment (EA)

Predicted air quality assessments for key stages of the conceptual 21 year mine plan (based on a detailed air quality assessment by PAE Holmes) were provided in the EA⁴. As detailed in Section 5.8.4 of the EA, the dust emissions for the Ulan Mine Complex have been calculated for:

- the surface operations from the Ulan Mine Complex, which includes the open cut and the underground mines (Ulan West and Ulan Underground);
- the upcast ventilation shafts and portal fans from the underground operations; and
- Bobadeen Quarry.

The assessment has considered five representative mining scenarios throughout the 21 year life of the Ulan Mine Complex, to ensure that the range and extent of proposed activities are considered. The five mining scenarios were as follows:

- Year 1 (nominally 2010) – construction of infrastructure, mining in the open cut and Ulan Underground;
- Year 5 – mining in the open cut, Ulan Underground and Ulan West;
- Year 7 – mining in the open cut, Ulan Underground and Ulan West;
- Year 12 – mining in Ulan West; and
- Year 17 – mining in Ulan West.

Bobadeen Quarry was assessed as a maximum production scenario during Year 5, which represents the period with most surface activity. The assessment considered the impacts of the Ulan Mine Complex alone and also the cumulative impact of the surrounding approved mining operations, including the Moolarben Coal Mine (MCM) Stage 1 and operations at the Wilpinjong Coal Mine (WCM). MCM Stage 2, has also been considered separately in the air quality assessment.

⁴ Ulan Coal Continued Operations Environmental Assessment, Appendix II – Air Quality Assessment (October 2009).

3.1.2.2 Project Specific Emissions

The results of the predictive air quality modelling have identified that the Ulan Mine Complex will meet all the relevant air quality criteria at all residential receiver locations. Dust emissions from the Ulan Mine Complex are relatively small due to the high proportion of coal production being sourced from the underground operation. Emissions from underground operations are typically lower than open cut mines due to:

- the minimal ground disturbance area associated with the underground operation;
- the minor intensity of surface operations required, i.e. earthworks; and
- the higher coal moisture content of underground coal when delivered to the surface.

As noted in the EA, ventilation points and the Bobadeen Quarry have been considered in the model. Emissions from these locations are minor in comparison to other surface activities and therefore do not significantly contribute to the dust emission levels for the Ulan Mine Complex.

A summary of the predicted maximum air quality emissions for the modelled years is as follows:

- the maximum annual average dust deposition contribution from the Project predicted at a privately owned residence is in the order of 0.9 g/m²/month, significantly less than EPA criterion of 4 g/m²/month;
- the maximum 24-hour average PM₁₀ concentration contribution from the Project predicted at a privately owned residence is in the order of 39 µg/m³. This is less than EPA criterion of 50 µg/m³;
- the maximum annual average PM₁₀ concentration contribution from the Project predicted at a privately owned residence is up to 8 µg/m³, significantly less than EPA criterion of 30 µg/m³; and
- the maximum annual average TSP concentration contribution from the Project at a privately owned residence is up to 9 µg/m³, significantly less than EPA criterion of 90 µg/m³.

To provide an assessment of the incremental impact of the predicted dust emissions from the Project on total local dust levels, the calculated dust levels for each mining scenario were added to the measured background dust levels for the local area. These background levels include dust contributions from existing operations as well as other approved and proposed mining operations.

3.1.2.3 Cumulative Emissions

An assessment of the cumulative air quality impacts associated with the Ulan Mine Complex and other major approved or proposed mining operations was also undertaken as part of the air quality assessment in the EA.

As noted within the EA, when the approved MCM Stage 1 and operations at WCM are included in the cumulative impact assessment, two private residences would be impacted by dust levels exceeding the annual average PM₁₀ assessment criterion of 30 µg/m³, being Residence 19 and Residence 22. One of these residences (Residence 19) was predicted to be impacted from Year 7 of the Project onwards however since the completion of the EA, the residence was demolished by its owner and the property rezoned to industrial. Therefore the air quality criteria is no longer applicable to this property.

The other residence (Residence 22 from the EA) is predicted in the EA to be impacted for all of the modelled years; however this residence is located within the MCM Stage 1 acquisition zone. Residence 22 is also predicted to be impacted by dust levels which exceed the annual average 4 g/m²/month deposition level assessment criteria for all modelled years. This residence was purchased and demolished by MCM Coal as it was located within the MCM Stage 1 acquisition zone.

Depending on the modelled year, a number of other residences owned by mining companies, or other non-private entities, are also predicted to be impacted by annual average PM₁₀ cumulative levels in excess of the criteria. As detailed in the EA, when the proposed MCM Stage 2 operations are included in the cumulative impact assessment, a total of nine residences were predicted to be impacted by annual average PM₁₀ cumulative levels in excess of the criteria, however the number of properties have changed since the completion of the EA due to ownership and land use / zoning changes.

At the time of original submission of this Plan, a total of six residences were predicted to experience exceedances of the air quality criteria. Of these six residences, four residences (13, 17, 18 and 274 from the EA) were not located within either the Ulan Mine Complex or MCM acquisition zone. Two of the residences (Residence 22 and 26 / 278 from the EA) are located within the MCM Acquisition zone and are now owned by MCM. These residences are located south of Ulan and are primarily affected by contributions from the proposed MCM Stage 2 operations.

A number of other residences owned by mining companies or other entities are also predicted to have annual average PM₁₀, TSP and dust deposition levels from the Ulan Mine Complex and other sources in excess of the criteria.

Since the time of original submission of this Plan, residences 13, 17 and 18 have been acquired by MCM and are not subject to air quality criteria. Resident 274 remains privately owned. Cumulative air quality impacts are managed in cooperation with MCM.

3.1.3 Air Quality Impact Assessment Criteria

This Plan provides details of the air quality and meteorological monitoring to be implemented and maintained in accordance with PA 08_0184 and EPL 394. shows the locations of air quality and meteorological equipment for the Ulan Mine Complex. Results from air quality monitoring is compared to impact assessment criteria provided in PA08_0184.

The former Department of Environment and Conservation’s (DEC now EPA) guidelines, ‘*Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW, December 2006*’ (Jan 2007) specify air quality assessment criteria relevant for assessing impacts from dust generating activities. The air quality goals relate both to dust concentration and dust depositions which are discussed further below.

3.1.3.1 Dust Concentration

Condition 19 (Schedule 3) of the Project Approval (PA 08_0184) specifies that UCMPL shall take appropriate measures to minimise the potential for dust emissions generated by the Ulan Mine Complex to cause additional exceedances of the criteria listed in **Table 3-1** at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 3-1 Long and Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criteria	
Total suspended particulate (TSP) matter	Annual mean	^a 90 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	Annual mean	^a 30 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	24 hour maximum	^a 50 µg/m ³	

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total ¹ deposited dust level
^c Deposited Dust ⁵	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Note for Table 3-1:

a Total Impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources).

b Incremental impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources);

c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and

d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

⁵ Depositional dust monitoring discontinued in November 2019, following a variation to EPL394 by the EPA in October 2019. Note this variation was not requested by UCMPL. Two HVAS monitors and a TEOM remain in operation to monitor air quality.

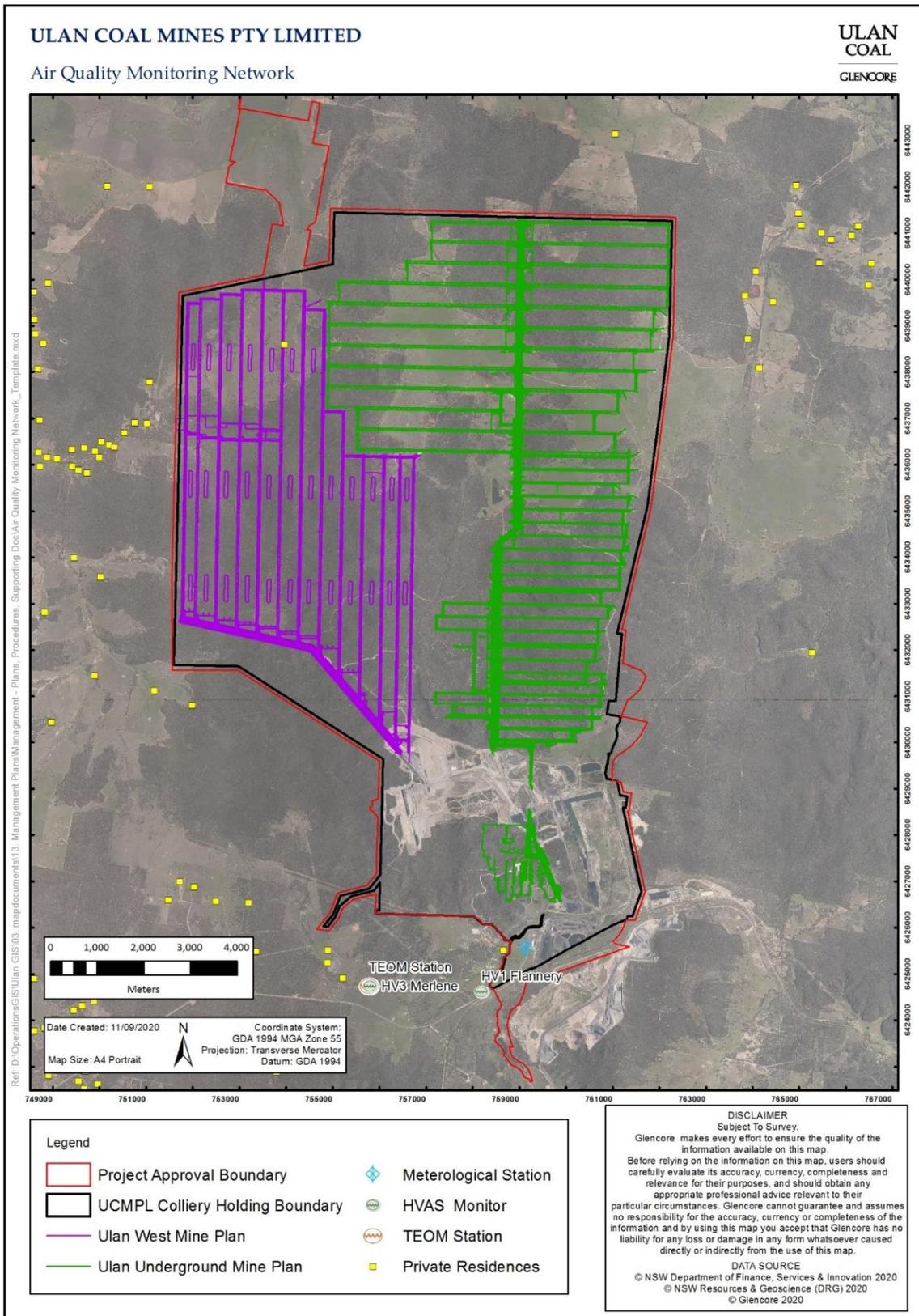


Figure 3-1 Monitoring Locations

3.1.3.2 Land Acquisition Criteria

Condition 20 (Schedule 3) of the Project Approval specifies that, if the dust emissions generated by the Ulan Mine Complex exceed the criteria in Tables Table 3-3 to Table 3-4 at any residence on privately-owned land or on more than 25% of any privately-owned land, then upon receiving a written request for acquisition from the landowner the Proponent shall acquire the land in accordance with the procedures in Conditions 6 and 7 of Schedule 4 of the Project Approval (refer to Section 3.2.1.5).

Table 3-2 Long Term Acquisition Criteria for Particulate Matter

Pollutant	Averaging Period	^d Criterion
Total Suspended Particulate (TSP) Matter	Annual	^a 90 µg/m ³
Particulate Matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³

Table 3-3 Short Term Acquisition Criteria for Particulate Matter

Pollutant	Averaging Period	^d Criterion
Particulate Matter < 10 µm (PM ₁₀)	24 hour	^a 150 µg/m ³
Particulate Matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³

Table 3-4 Long Term Acquisition Criteria for Deposited Dust⁶

Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level
^c Deposited Dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes for Tables 3-2 to 3-4:

a Total Impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to other sources).

b Incremental impact (i.e. incremental increase in concentrations due to the project on its own).

c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited matter – Gravimetric Method.

d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

3.1.4 Air Quality Management Controls

In order to mitigate any potential air quality impacts from the Ulan Mine Complex, a number of air quality management controls will be implemented throughout the life of the operation. Specific operational controls methods to minimise the below identified potential sources of air quality impacts are documented below.

3.1.4.1 Dust Management Controls

Dust is managed by UC MPL by implementing design and operational controls at the source as described in **Table 3-5**.

⁶ Depositional dust monitoring discontinued in November 2019, following a variation to EPL394 by the EPA in October 2019. The removal of the monitoring was due to majority of the samples over a period of time being considered invalid due to contamination, mainly via bird droppings and insects. Two HVAS monitors and a TEOM remain in operation to monitor air quality.

Source	Dust Management Control	Responsibility
Construction disturbance	Topsoil stripping shall be undertaken when there is sufficient moisture content in the soil. Cleared areas will be watered by water cart based on monitoring.	Managers, Supervisors Mining
Haul roads and traffic areas	Dust suppression controls by water cart shall be implemented as required according to visual monitoring, frequency of traffic and potential for dust generation (refer to Table 3-6 Treatment of Roads).	Managers, Supervisors, Water Cart Operators Mining
Active Mining Areas	Watering shall occur in active mining areas, active spoil emplacement areas and all areas that are subject to frequent vehicle movements. All equipment utilised on site is to be operated with sufficient dust controls; maintained in an efficient and effective manner, including: <ul style="list-style-type: none"> • Drill rigs equipped with dust control systems, such as dust curtains and/or water injection sprays • Dump hopper and crushing plant fitted with automatic sprays. 	Managers, Supervisors, Water Cart Operators Mining Operators,
Storage	Water suppression shall be used around all active stockpile areas.	Managers, Supervisors, Superintendents, Water Cart Operators Mining
Rehabilitation areas	Progressive site rehabilitation and revegetation shall be implemented. Vegetation clearing is to be restricted ahead of mining operations. Works are to be programmed to allow for the ensuing 3-4 months of operations to be cleared only, where possible. Mine spoil dumps are to be rehabilitated as soon as practicable after mining, including temporary covers where rehabilitation is not feasible. Existing facilities and infrastructure are to be used where possible to limit disturbance to vegetated areas.	Managers, Supervisors Mining
Other areas of Ulan Complex	Visual dust monitoring shall be continuous throughout the life of the mine. Dust forecast systems are used in order to schedule planned work activities to minimise dust creation from the UCMPL site. Meteorological alarms will need to be logged with details of site action taken.	Mining Supervisors, Operators, Environmental Staff

Table 3-5 Dust Management Controls

UCMPL roads are managed as described in **Table 3-6** to effectively reduce the amount of dust procedure by site:

Road Type	Treatment
Obsolete roads	Ripping and revegetation to be performed within an appropriate time frame when roads become obsolete and are no longer required.
Primary access roads (with high traffic volumes).	Shall be sealed or chemically stabilised, where appropriate.
Long term primary haul roads	Shall be chemically stabilised or subject to wet suppression to enhance surface binding or moisture retention. Access points where unsealed traffic surfaces adjoin sealed roads shall be sealed or chemically stabilised.
Temporary haul roads and other unsealed roads	Shall be watered when in use and as required to effectively manage dust. Preventative measures will be applied, where practicable, to prevent material being deposited on haul roads, such as: <ul style="list-style-type: none"> ▪ avoid overloading which could result in spillage; ▪ avoid vehicles from mining areas tracking material onto roads which are chemically stabilised or treated with a water extender through the use of measures such as grids; ▪ provide for storm water drainage to prevent water erosion onto stabilised unsealed roads; and ▪ prevent wind erosion from adjacent open areas through temporary revegetation or permanent rehabilitation where possible. <p>General speed on unsealed haul roads will be limited to 60 km/hr for heavy vehicles, with vehicles required to slow down and notify water cart operators in the event that road dust entrainment is visible.</p> <p>In the event that road dust is visible and sustained above wheel height, truck operators are to call for additional dust suppression until such time that road dust is no longer visible above wheel height;</p> <p>If dust is visible above the tray height for a sustained period, operations will be modified to reduce dust, e.g. by reducing vehicle speed. In the event that the modification of operations does not reduce visible dust below tray height, supervisors will call for additional dust suppression and cease operations pending further dust suppression being applied to the roadway. Consideration will be given to whether dust is being generated within the pit, at surface or out of pit in exposed areas;</p> <p>Visual dust monitoring will be undertaken by supervisory staff to ensure effective dust control, with visual inspections to be documented; and UCMPL will conduct regular maintenance of haul roads including scheduled grading and, where appropriate, gravelling of heavy traffic areas.</p>
Hardstand areas (with frequent mobile equipment activity)	Shall be watered when in use. If dust suppression is deemed insufficient based on visual monitoring, chemical stabilisation is to be implemented. Mitigation measures shall be applied to chemically stabilised roads and hardstand areas where practicable.
Sealed roads	Application of preventative measures where practicable to prevent material being deposited on roads, such as: <ul style="list-style-type: none"> • Seal or chemically stabilise access points where unsealed traffic surfaces adjoin sealed roads; • Seal, chemically stabilise or vegetate shoulders of sealed roads; • Cover road haul trucks if transporting material which results in visible dust above the tray height or if it is required by the Site's mining approval;

	<ul style="list-style-type: none"> Wet the material being hauled if material is dry and cannot be covered as required to avoid dust emitted from the load; Avoid overloading which could result in spillage; and Provide for storm water drainage to prevent water erosion onto sealed roads. <p>Provide for timely clean-up of material spilled on the road and rerouting of traffic around spills until they are removed; Carry out periodic visual inspections of road surface silt loadings; Before entering sealed roads all vehicles shall be cleaned through the use of grids or alternative measure, such as wash bays; and Provide wash down bays to prevent vehicles carrying mud, silts and dust from site onto sealed public roads.</p>
Routes within overburden emplacement areas	Shall be restricted to defined routes, with wet suppression applied as required.

Table 3-6 Treatment of Roads

UCMPL will implement the following operation specific dust controls to reduce dust emissions from the Ulan Mine Complex.

Source	Dust Management Control	Responsibility
Material Extraction and Dumping	<p>Preparation of work areas, eg: watering extraction areas, to reduce dust potential.</p> <p>Double handling of material is to be minimised.</p> <p>The distance of fall of overburden material during tipping is to be minimised as far as practical.</p> <p>Where it is identified that material types contain fine and/or friable material, a risk-based approach to control dust shall be undertaken e.g. minimisation of topsoil stripping during adverse weather conditions.</p> <p>During periods of high winds sheltered dumping locations are to be utilised.</p>	Managers, Mining Supervisors, Operators
Coal Handling, Crushing and Screening	<p>To reduce dust emissions from coal handling:</p> <ul style="list-style-type: none"> Automated misting sprays are to be applied on hoppers; Hoppers are to be partially enclosed where possible; Belt cleaning is applied to remove coal debris; New and existing infrastructure shall enclose conveyors, or partially enclose conveyors, including top and side that face the prevailing wind (i.e. windward side); New and existing infrastructure shall include skirting fitted to conveyors at transfer points; An implementation plan shall be developed to include the enclosure or partial enclosure of unenclosed conveyors and fitting of skirts 	Managers, Mining Supervisors

Source	Dust Management Control	Responsibility
	<p>at transfer points (pending feasibility studies);</p> <ul style="list-style-type: none"> • New infrastructure shall include the application of misting sprays on transfer points; • All surface transfer points shall be reviewed and feasibility of management controls will be investigated and included in the above implementation plan; and • Crushing and screening infrastructures will, as a minimum, implement watering for dust suppression purposes. This measure is applicable to mobile and fixed location plant used for coal and other materials; and • Mobile crushing plant will incorporate sufficient dust suppression systems. 	
Rail Loading Operations	A load profiling system that ensures streamlined and consistent coal surfaces within rail wagons is used for the purpose of reducing coal dust emissions during rail operations.	Managers, Mining Supervisors
Dozer Operations	<p>Hours of operation of dozers are to be minimised, where practical.</p> <p>Dozer travel speed and distances are to be minimised, as practical.</p> <p>Watering of material and dozer routes and work areas prior to and as required during operations.</p> <p>Dozer operations are to be avoided in wind exposed areas during dry, windy conditions.</p>	Managers, Mining Supervisors, Dozer Operators
Drilling Operations	<p>Dust collection systems are to be activated during drilling. (For drill rigs with dry collection systems, preference to be given to those installed with bag filters as they are considered more effective than those fitted with cyclones).</p> <p>Dust suppression systems are to be implemented during drilling, depending on the drill (eg: dust curtains, which are to be in the down position; water injection down the drill hole; vacuum dust collection; and water spraying of dust shavings upon lift-off).</p> <p>Any drilling materials discharged adjacent to the rig will be wetted down.</p> <p>Collected dust will be disposed of in a manner to avoid it becoming airborne.</p> <p>Drilling operations will be stopped if the dust suppression system is inoperable or dust is visible above the drill deck level for a sustained period.</p>	Drilling Operators, Mining Supervisors
Blasting Operations	Blast areas are to be watered prior to the loading of shots.	Project Engineer, Water Cart Operator

Source	Dust Management Control	Responsibility
Dragline Operations	<p>The following steps should be taken to minimise dust from dragline operations:</p> <ul style="list-style-type: none"> • When filling the bucket avoid over-dragging and overflowing the material. • When lifting the bucket lift cleanly away from the dig face in order to allow any excess material on the bucket teeth to fall away with minimum dust. When lifting the bucket from the cut, keep the bucket clear of all walls and batters and hoist up with minimum spillage. If the bucket is kept low to the ground any spillage will create the minimum amount of dust • When emptying the bucket, drop heights are maintained to a realistic minimum, especially during windy conditions. • Particular care is to be exercised when material being moved is dry and contains excessive fines, particularly in combination with strong winds. 	Mining Supervisors, Dragline Operator
Topsoil Stockpiles	<p>Topsoil stockpiles will be seeded as soon as possible, but no later than three months after placement.</p> <p>Stockpiles height will be limited, where possible, to a height of less than three (3) metres.</p> <p>Access to topsoil stockpiles will be limited through signage and removing access to stockpiles for vehicular traffic.</p> <p>Topsoil will be stripped and placed on shaped areas, with topsoil related activities ceased during adverse meteorological conditions, such as on dry, windy days.</p> <p>Tree mulch will be incorporated from land clearing activities into topsoil stockpiles to increase surface roughness.</p>	Managers, Mining Supervisors, Superintendents
Overburden Emplacement	<p>Overburden emplacement areas will be shaped to minimise dust generation potential.</p> <p>Depending on the duration for which overburden emplacement areas are to be in place the following controls are required:</p> <ul style="list-style-type: none"> • Implementation of a dust management strategy for overburden emplacement areas which are to be in place for less than twelve months. By example, restricting vehicle access to formed roads, or application of wet suppression or chemical suppression where practicable, • Application of 'Temporary Rehabilitation' for overburden emplacement areas which are to be in place for one to two years. Temporary 	Managers, Mining Supervisors, Water Cart Operators

Source	Dust Management Control	Responsibility
	<p>Rehabilitation refers to the use of temporary cover crops to reduce dust prior to construction of the final landform,</p> <ul style="list-style-type: none"> Application of 'Permanent Rehabilitation' for overburden emplacement areas which are to be in place for over three years. Permanent Rehabilitation takes place on land that will not be disturbed again, and typically comprises topsoiling and planting with selected species. 	
Coal Stockpiles	Water suppression shall be used around all active coal stockpile areas.	Mining Supervisors, Water Cart Operators
Exploration	<p>All drilling contractors to undertake Community Awareness Training</p> <p>Limit vehicle speed on unsealed roads to <60km/hr. If dust cannot be controlled at vehicle travelling speed, vehicles shall slow down so that dust levels are maintained at or below wheel height.</p> <p>Water carts used during hot, dry conditions on public roads when dust is high risk</p>	<p>Water Cart Operators</p> <p>Exploration Contractors, Exploration Manager</p>

Table 3-7 Operation Specific Dust Controls

The total disturbance footprint and untreated hardstand areas will be kept to the minimum practicable.

3.1.5 Offensive Odours

In accordance with PA 08_0184⁷ and Section 129 of the POEO Act, UCMPL will ensure no offensive odours will be emitted from site.

The primary potential odour sources at UCMPL are from spontaneous combustion. Secondary sources include potential odour emissions from hydrocarbons, effluent servicing and water storages.

3.1.5.1 Spontaneous Combustion

Spontaneous combustion has the potential to result in air quality and odour impacts where it is not effectively managed. To determine the potential risk of spontaneous combustion occurring spontaneous combustion propensity testing was undertaken for Ulan Underground and Ulan West Underground. Spontaneous combustion test results of the Ulan Seam vary considerably and indicate the coal has a moderate to high propensity to spontaneously combust.

Management of spontaneous combustion during mining operations is a key safety and environmental issue for UCMPL.

Processes in place to prevent odour from Spontaneous Combustion include:

- Identification of carbonaceous material with spontaneous combustible properties during the mine planning process to minimise the extent to which this material is exposed to oxygen as

⁷ Schedule 3, Condition 21.

well as to ensure that the material is buried at depth within the overburden emplacement areas;

- Minimising the amount of reactive material sent to spoil;
- Stockpile Management: rotating coal stock on a first in first out basis when possible;
- Installation of therma-coupling monitoring to detect and respond to potential heating events;
- Restricting the ingress of oxygen as much as possible in all areas;
- Inspections and monitoring of spontaneous combustion potential is undertaken as part of the Shift Supervisor's shift inspection and is regularly reported to the appropriate personnel. The Shift Supervisor's shift inspection, which involves monitoring of spontaneous combustion and spontaneous combustion potential, is completed twice a day during day shift and night shift. The inspection is reported in the Statutory Production Shift Inspection Report and to the Production Superintendent, MEM and Process Superintendent if any spontaneous combustion, or potential for spontaneous combustion, is observed during the inspection.

Processes in place to control odour from Spontaneous Combustion include:

- Timely and effective management of any spontaneous combustion events that do occur. This includes methods for handling and disposing of material which has ignited by digging out the material, spreading it out, water and track roll it and cover with inert material if it is waste material. Return to location and process if it is coal; and
- Cover in-situ with inert material, shape the surface so it drains and then track roll the surface and batters;
- Cool the area with the application of water. This may include the option of transferring hot coal and processing through the CHPP to cool.

3.1.5.2 Other offensive odours

UCMPL will also manage its hydrocarbon stores, effluent and water storages to minimise the potential offsite emissions of offensive odours⁸. The primary controls for these secondary stores includes:

- separation from sensitive receivers;
- efficient operation and maintenance of potential odour generating facilities;
- monthly inspections of the facilities.

3.1.5.3 Fume

In accordance with PA 08_0184⁹ UCMPL are required to manage fume. Fume will be managed in accordance with the measures detailed in Post Blast Fume Procedure¹⁰.

No blasting activities are undertaken at the Ulan Complex as Ulan Open Cut is currently under care and maintenance. A full review of the fume management will be undertaken should blasting recommence.

⁸ Section 129 of Protection of the Environment Operations Act 1997.

⁹ Schedule 3, Condition 21.

¹⁰ ULNOC-1105874907-6670.

3.1.6 Air Quality Management

As required by PA 08_0184¹¹, UCMPL have implemented an air quality management system that employs both reactive and proactive mitigation measures of managing air quality that includes a combination of real-time monitors (equipped with real-time response triggers), and high volume air samplers to evaluate the performance of the project.

3.1.6.1 Meteorological Monitoring

UCMPL utilise a daily weather and dust risk forecasting tool to predict the likelihood of adverse conditions for dust generation and assist operational dust management. A daily report showing forecast weather conditions and predicted dust risk is emailed to Mining and Coal Handling and Preparation Plant (CHPP) Supervisors, Control Room Operators and Environment and Community personnel at approximately 6am.

This daily forecast system provides early warning of potential adverse meteorological conditions and dust risks, thus facilitating proactive management of operational activities to reduce dust generation potential. The daily report includes a two-day forecast of:

- dust risk index;
- dust plume profile (dust risk contour plots); and
- meteorological conditions (including wind roses, vertical temperature profiles & rainfall).

Mining Supervisors are to review the daily forecast report prior to the pre-start shift meeting. In the event that high dust risks are forecast the Mining Supervisor will review the daily plan and prepare to implement any changes or contingency measures which may be required to ensure that dust generation potentials are reduced. Contingency measures include:

- Review of planned operations with provisions for modification of activities;
- Application of additional dust suppression/alteration of operations if necessary;
- Stop activities in consultation with the Mine Manager.

Contingency measures implemented are tracked using the Shiftly Report. The dust risk forecast should then be discussed with the oncoming crew during the pre-shift safety discussion, including any contingency measures to be employed during the course of the shift.

Further review of dust risk, weather conditions and performance of control measures will also be discussed during the Daily Production Meeting.

Forecasts can also be accessed via the website where hourly dust charts can be viewed and blast simulations tested <https://mining.weatherzone.com.au/>.

3.1.6.2 Air Quality Surveillance

UCMPL has implemented a dust surveillance camera network to allow supervisors and mine management to remotely monitor operational dust management. The cameras record video 24-hours a day, 7 days per week with video footage stored for a period of 2 years. Surveillance camera imagery is accessible by personnel via TV screens located at USO, in the environmental department, and on the CITEC SCADA System. The cameras are in the following locations:

- At the workshop, monitoring dust generation from the open area;
- Barrier Pit;
- Hub Stockpile;

¹¹ Schedule 3, Condition 22.

- Train loadout overlooking east side of tailings dam;
- Train loadout overlooking south side of the tailings dam.

Mining Supervisors regularly assess dust conditions demonstrated by the camera network against the UCMPL Dust TARP contained in the DMP. This is to result in the implementation of controls as required and notification to operational staff to modify work methods to conditions as outlined above in **Section 3.1.6.1**.

The surveillance camera network will also be used to investigate peak dust episodes, community complaints and identify dust sources.

3.1.6.3 Active Management – Current Practices

To facilitate the development of an extensive air quality monitoring network in the vicinity of the Ulan village and other private residences adjacent to the Ulan Mine Complex, UCMPL have implemented a data sharing agreement with MCM and WCM to enable shared access to air quality monitoring results from each of the operations. This agreement was executed on the 27 March 2012.

As detailed in **Section 3.2.1.2**, the unattended TEOM continuous dust monitoring undertaken by UCMPL and MCM has the ability to notify relevant UCMPL personnel when monitoring results indicate dust levels at surrounding sensitive receivers are approaching, or have exceeded, the relevant Project Approval dust criteria.

In the event that such notification of elevated dust levels is received by UCMPL personnel, UCMPL will undertake a review of the current mining operation (e.g. machinery locations and activities, meteorological conditions etc.) and determine whether any modification to the operation is required to reduce the potential for dust related impacts.

UCMPL will investigate any reported exceedances of dust criteria at private residences on a case by case basis. Should site specific monitoring or real-time monitors indicate adverse dust impacts from the Ulan Mine Complex and/or operations at MCM and WCM, UCMPL in cooperation with MCM and WCM, will investigate reasonable and feasible measures to mitigate dust at the affected receiver, in consideration of the attributable dust sources.

3.1.7 Continuous Improvement

3.1.7.1 Best Practice Air Quality Mitigation Measures

Where possible, UCMPL will attempt to implement all reasonable and feasible best practice air quality mitigation measures. The basis for continuous improvement of air quality mitigation measures will be through the ongoing monitoring of dust impacts and the corrective/preventative action process outlined in the UCMPL Environmental Management Strategy¹² (EMS) and **Section 4.1.4.5** of this Plan. Through the development of corrective/preventative actions, UCMPL will investigate ways to reduce the air quality impacts generated by the operation. Any new mitigation measures that are implemented as a result of these investigations will be reported in the Annual Review report (AR, formerly the Annual Environmental Management Report).

UCMPL will also maintain awareness of new technologies for air quality impact mitigation through participation by GCAA in relevant industry groups.

¹² ULNCX- 111515275- 870.

3.1.7.2 Active Air Quality Management

As noted in **Section 3.1.6.1**, the Mining Supervisor will regularly review weather forecast information to assess the potential impacts the weather conditions may have on mining operations and environmental impacts. UCMPL will progressively develop the forecasting of potential environmental impacts as both site based experience and appropriate technologies become available. In addition, GCAA are also undertaking a continuous improvement program to identify and implement, where feasible, management mechanisms which provide for the prediction of potential dust emission levels based on predicted meteorological information. As discussed in **Section 3.1.6.1** above, this continuous improvement program will also review technologies available to accurately measure meteorological information.

The long term objective of the air quality component of the active management system is to:

- provide an estimate of the probability of the impacts occurring;
- quantify the extent of the potential impacts; and
- provide a mechanism to assess the change that could occur due to meteorological conditions and mine operations and tailor the mining activities, where possible, to suit the forecast conditions.

3.1.8 Change Management

All changes to operations, facilities, plant equipment and production processes are required to be assessed in accordance with the change management process. Change management will be undertaken in accordance with *GCAA Change Standard*¹³ and UCMPL EMS¹⁴, which provides the following process for managing the risks associated with change.

- identify the change;
- assess the potential risks associated with the change and develop a risk management plan;
- approve the change subject to the risk management plan;
- communicate and implement the change and risk management actions;
- monitor and evaluate the change and risk management plan; and
- document the change management process.

3.1.9 Training

General awareness training is provided to all new employees and contractors as part of the Ulan Site Specific Induction program.¹⁵

The induction is referenced in the EMS Training Needs Analysis (TNA).¹⁶ Employees receive refresher training, which includes air quality management every three (3) years also required by the TNA.

Surface Operations Mining Supervisors receive specific air quality management training every three (3) years as required by the TNA.

¹³ GCAA-625378177-9979 12.0 Change.

¹⁴ Section 2.3, ULNCX-111515275-870 Environmental Management Strategy.

¹⁵ Ulan Surface Operations – ULNOC-1105874907-1747, Ulan No.3 Underground – ULNUG-849165555-5762, Ulan West – ULWUG-729531900-105.

¹⁶ ULNCX-111515275-870 Environmental Management Strategy, Appendix C – Environmental and Community Training Needs Analysis.

3.2 Measurement and Evaluation

3.2.1 Air Quality Monitoring Program

Air quality monitoring is carried out using a combination of monitors consisting of two (2) high volume air samplers (HVAS), one Tapered Element Oscillating Microbalance (TEOM), and of one (1) meteorological station, their locations identified on **Figure 3-1**.

In addition to the air quality monitoring locations detailed in **Figure 3-1** monitoring of the Ulan operations is supplemented by the MCM air quality monitoring network, which includes the placement of a TEOM in Ulan Village, and the meteorological weather station located at WCM . The dust monitoring and meteorological stations are operated and maintained (including calibration) in the approved method required by the EPA in EPL:394.¹⁷

The frequency of air quality monitoring, and the pollutants monitored as required by EPL 394¹⁸, is detailed in **Table 3-8** below.

Table 3-8 Air Quality Monitoring Frequency

Type of Monitoring	Frequency	Pollutant
High Volume Air Samplers	Every 6 days ¹⁹	Total suspended particles ²⁰
TEOM	Continuous ²¹	PM10 ²²
Meteorological (Ulan)	Continuous ²³	N/A

Refer to Footnote 5 at 3.1.3.1 regarding removal of depositional dust gauges.

Air quality monitoring locations will be reviewed and, where necessary, modified in consultation with DPE and EPA over the life of operations according to progressive monitoring results, physical changes in mining operations, or following the acquisition of private property by UCMPL or MCM.

3.2.1.1 High Volume Air Samplers

UCMPL has two (2) high volume air samplers (HVAS) measuring Total Suspended Particle (TSP) concentrations, identified as HV1 at Flannery's and HV3 at 331 Cope Road (also known as Merlene's) on **Figure 3-1** as required by EPL 394.²⁴

The samplers are operated in the approved method required by the EPA.²⁵

3.2.1.2 Real-Time Dust Monitoring

Figure 3-1 shows the one (1) TEOM that monitors PM₁₀ concentrations on a continuous basis as required by EPL394.

AM-15 Particulate matter – TSP – high-volume sampler method - AS/NZS 3580.9.3 *Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – Total suspended particulate matter (TSP)* High-volume sampler gravimeter method; AM-22 Particulate matter – PM10 – TEOM – AS 3580.9.8 *Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – PM₁₀ continuous direct mass method using a microbalance analyser*; AM-2 Guide for measurement of horizontal wind for air quality applications – AS 3580.14 *Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications*; AM-4 Meteorological monitoring guidance for regulatory modelling applications – AS 3580.14 *Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications*.

¹⁸ Section M2.2, *Air Monitoring Requirements*, Environment Protection Licence 394.

¹⁹ Section M2.2, *Air Monitoring Requirements*, Environment Protection Licence 394.

²⁰ Section M2.2, *Air Monitoring Requirements*, Environment Protection Licence 394.

²¹ Section M2.2, *Air Monitoring Requirements*, Environment Protection Licence 394.

²² Section M2.2, *Air Monitoring Requirements*, Environment Protection Licence 394.

²³ Section M4.2, *Weather Monitoring Requirements*, Environment Protection Licence 394.

²⁴ Section P1.1, *Location of monitoring/discharge points and areas*, Environment Protection Licence 394.

²⁵ Section 3, Table 3, *Approved methods for the sampling and analysis of air pollutants in NSW*, NSW Environment Protection Authority.

The TEOM data is used in conjunction with HVAS data to assist in the following:

- provide an understanding of regional episodic dust events;
- provide an understanding of local episodic dust events;
- provide an understanding of potential dust episodes resulting from mining activities; and
- to alert when dust levels are approaching the relevant criteria so that the operation can be adjusted accordingly (if required).

The TEOM is fitted with an automatic alarm system which sends a SMS to key UCMPL mining personnel informing them that measured dust levels are approaching the air quality criteria, enabling them to respond in the manner required under the Trigger Action Plan (TARP), at **Appendix B** -of this Plan.

The TEOM is operated in the approved method required by the EPA.²⁶

3.2.1.3 Meteorological Monitoring

Continuous²⁷ real time stability class data is accessed from SX74M2, location shown at **Figure 3-1** as “Meteorological Station” consistent with the requirements of EPL 394²⁸ which requires measurement of Sigma Theta. The *NSW Industrial Noise Policy* and the *Noise Policy for Industry*²⁹, provides that any of; temperature lapse rate; Pasquill-Gifford scheme; and Sigma Theta calculation methods may be used as standard monitoring methods for noise assessments. Temperature lapse rate data, as required by PA 08_0184³⁰ is available from a weather monitoring station at WCM, approximately 10 kilometres west, south west of the Ulan operations in the same airshed, and is considered suitably representative for the site.

The parameters recorded by SX74M2 include rainfall, sigma theta, solar radiation, temperature (at 1.5 metres, 10 metres and 30 metres), wind speed (horizontal and vertical) and wind direction (10 metres and 30 metres). This allows for up to date predictions to be made on the impact of weather conditions on mining operations and noise emissions from mining operations.

The weather stations are maintained and operated in the approved method required by the EPA.³¹

Should continuous monitoring by the meteorological station be unavailable for a period of time greater than 48 hours, UCMPL will notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

3.2.1.4 Compliance Assessment Protocol

In the event of an exceedance of the criteria contained in **Table 3-2** and **Table 3-3**, UCMPL will investigate and report the exceedance in accordance with **Section 3.2.2.3**.

Where consistent exceedances were recorded at the dust monitors **and are attributable** to Ulan Coal, Ulan would modify the monitoring program to determine any potential impacts to specific private landholders. This could involve placement of additional real time monitors which would be used to assess impacts on individual residences or 25% percent of privately owned land.

In the event of exceedance of the land acquisition assessment criteria provided in **Table 3-3** to **Table 3-8**, UCMPL will notify landowners that the exceedance has occurred, and, upon written request for

²⁶ Section 3, Table 3, *Approved methods for the sampling and analysis of air pollutants in NSW*, NSW Environment Protection Authority.

²⁷ For the purposes of Condition M4.1 and M4.2, continuous monitoring is defined as uninterrupted monitoring that occurs over a specified timeframe. Continuous monitoring should only be interrupted during planned equipment maintenance.

²⁸ Environment Protection Licence 394, Condition M4.2.

²⁹ *NSW Industrial Noise Policy (2000)*, Appendix D,

³⁰ Project Approval 08_0184, Schedule 3, Condition 23(b).

³¹ Section 3, Table 3, *Approved methods for the sampling and analysis of air pollutants in NSW*, NSW Environment Protection Authority.

acquisition from the landowner, acquire the land in accordance with Conditions 6 and 7 of Schedule 4 of the Project Approval.

Air quality data will be collected and assessed in conjunction with meteorological data to determine the UCMPL contribution to recorded dust events.

3.2.1.5 Independent Review and Land Acquisition Process

In the event that a landowner considers that UCMPL is exceeding air quality criteria at his or her property, the landowner may request an independent review of the air quality impacts at the property. The independent review will be conducted in accordance with the procedure described in Schedule 4, Conditions 3 to 5 of the Project Approval. The procedure is summarised as follows:

1. UCMPL receives a request from a landowner for an independent review of the air quality impacts at the residence;
2. UCMPL provides the Secretary of the DPE with a copy of this request;
3. If the Secretary of the DPE confirms that the request is reasonable, then UCMPL, in consultation with the DPE, appoints a suitably-qualified person to undertake an independent review;
4. The independent review would include air quality monitoring over a suitable period of time and over a suitable range of meteorological conditions;
5. A copy of the results of the independent review would be provided to the landowner and Secretary of the DPE by UCMPL; and
6. Depending on the results of the independent review, a number of actions could be pursued in accordance with the Project Approval conditions. These actions are summarised as follows:
 - If the independent review finds exceedances of air quality criteria due to the UCMPL operation, UCMPL will take all reasonable and feasible measures to reduce air quality impacts and/or will come to an agreement with the landowner, which may include acquisition of the property as identified in Conditions 6 and 7 of Schedule 4 of the Project Approval and Glencore document
 - *GCAA-625378177-4600 11.15 Land Acquisition and Compensation* guideline. If the independent review finds that exceedances of air quality criteria are in part due to UCMPL and in part due to a source other than UCMPL, then actions by UCMPL and the other mine(s) shall be as directed by the Secretary of the DPE; or
 - If the independent review finds that exceedances of air quality criteria are due in whole to a source other than UCMPL then no further action is required by UCMPL.

Further detail on the independent review and land acquisition process is included in Section 3.5 of the EMS.

3.2.2 Reporting

All external and internal reporting is undertaken in accordance with the reporting requirements of the EMS³². Reporting requirements are presented in **Table 3-9** below.

Table 3-9 Reporting Requirements

Requirement	Trigger	Agency
Annual Review	Project Approval	DPE – Manager Mining Projects DRE

³² ULNCX- 111515275- 870.

Requirement	Trigger	Agency
		EPA DPI - Water MWRC
Incident Reporting	Immediately notify the DPE and any other relevant agencies after it becomes aware of an incident. The notification must set out the location and nature of the incident. If the incident triggers the Pollution Incident Response Management Plan (PIRMP), then reporting must be consistent with the PIRMP.	Notification must be made in writing via the Major Projects Planning Portal (previously emailed to compliance@planning.nsw.gov.au)
Non Compliance Reporting	Notify the DPE within seven days of becoming aware of non-compliance, set out in the condition that the project is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	Notification must be made in writing via the Major Projects Planning Portal (previously emailed to compliance@planning.nsw.gov.au)
EPL Annual Return*	EPL 394	EPA
Quarterly Environmental Monitoring Summaries [#]	Project Approval	UCMPL Website www.ulancoal.com.au
EPL 14 day Reports ^{33*}	EPL 394	UCMPL Website ³⁴ www.ulancoal.com.au
Community Complaints Register	Project Approval- Update Monthly	UCMPL Website www.ulancoal.com.au

*Monitoring results provided in these reports include monthly average, max and min sampling results for each licensed monitoring location.

All reports will provide an assessment of compliance with all relevant performance measures and indicators.

A summary of the air quality monitoring results, graphical representation, will be presented as required at UCMPL's Community Consultative Committee.

3.2.2.1 Internal Reporting

If a non-compliance with the air quality impact assessment criteria is identified (refer to **Section 3.1.3**) an internal report detailing the circumstances of the non-compliance and resulting actions will be developed and submitted to CAA in accordance with UCMPL's EMS. Following the identification of

³³ Section 66(6) of the *Protection of the Environment Operations Act* requires that Licensees who undertake monitoring as a result of a licence condition must publish or make available pollution monitoring data within 14 days of obtaining the data and/or receiving a specific request for a copy of the data. Licensees who maintain a website must make the monitoring data related to pollution available in a prominent position on their website. For the purposes of these requirements, the timeframe for publishing or providing data is 14 working days.

³⁴ UCMPL complete this reporting via monthly reports, which are updated periodically to show date the specific monitoring data is received and date the data is published.

non-compliances, this Plan will be reviewed to incorporate any additional dust monitoring or management activities, if required.

3.2.2.2 Incident Reporting

In accordance with PA 08_0184³⁵ and the requirements of EPL 394, the Environment and Community Manager (or delegate) will notify the Secretary (DPE) and the Environment Protection Authority (EPA) of any incident causing or threatening material harm to the environment immediately on becoming aware of the incident. Within 7 days of the incident, UCMPL will provide a detailed report to the DPE and the EPA.

For detailed incident reporting information, refer to Section 3 of the EMS and UCMPL's *Pollution Incident Response Management Plan*³⁶.

3.2.2.3 External Reporting

In accordance with PA 08_0184³⁷, a copy of this Plan and summaries of air quality monitoring results compared against the air quality criteria specified in the Project Approval will be made publicly available on the UCMPL website <http://www.ulancoal.com.au>. UCMPL will update these results on a quarterly basis.

Additionally, the Annual Review will include all air quality monitoring results for the corresponding year. The Annual Review will also include an assessment of the air quality monitoring results against the air quality impact assessment criteria, the predictions in the EA and any trends in monitored dust levels over the period in accordance with PA 08_0184³⁸. In addition, any complaints relating to dust emissions from UCMPL, and the response actions taken, will be reported in the Annual Review.

A summary of air quality monitoring results will also be available on UCMPL's website. Performance monitoring, which includes an assessment of the effectiveness of dust controls and compliance with the relevant Project Approval and EPL 394 conditions, may be discussed at CCC meetings where air quality related complaints occur.

3.2.2.4 Corrective Action

Table 3-10 summarises the potential air quality related issues that may arise and the appropriate corrective action to be taken.

Table 3-10 Corrective Actions

Issue	Corrective Action
Exceedance of EPL or Project Approval Air Quality Conditions	Investigation of exceedance, undertaking air quality mitigation measures for future operations where applicable. Report exceedance to EPA, DPE and senior management, as required.
Exceedance of Project Approval Air Quality Land Acquisition Criteria	Investigation of exceedance, undertaking air quality mitigation measures for future operations where applicable. Report exceedance to EPA, DPE and senior management, as required. Initiation of land acquisition process, if required, as detailed in Section 3.2.1.5

³⁵ Schedule 5, Condition 6.

³⁶ ULNCX-111515275-2432.

³⁷ Schedule 5, Condition 10.

³⁸ Schedule 5, Condition 3.

Community complaints	Investigation of complaint, undertake mitigating measures where applicable and provide feedback to the complainant. Report complaint to senior management. Provide feedback to mine planning and production personnel, where relevant. The investigation may also include assessment of impacts at the residence, if required.
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Further information on non-compliance can be found in Section 4 of the EMS.

3.2.2.5 Monitoring Records

Monitoring records are kept for 7 years in accordance with *GCAA Standard 3.0 Documents and Records*³⁹ although EPL 394 requires monitoring records are maintained on site for at least 4 years.

3.2.3 Community Complaints

Community complaints management includes receipt of complaints, investigation, implementation of appropriate remedial action, and feedback to the complainant as well as communication to site management or personnel and notification to external bodies, such as the EPA, where necessary.

All community complaints received by the Ulan Mine Complex are managed in accordance with the Ulan Mine Complex Section 3.4.7 of the EMS. UCMPL have developed a *Complaints Procedure*⁴⁰ to assist in recording complaints, complaint investigation and follow up actions. The Environment and Community Manager is responsible for complaints management.

In response to an air quality complaint, UCMPL, in consultation with the complainant, will arrange monitoring at or near the complainant’s residence where appropriate and where agreed to by the complainant. The complainant is to be advised of these arrangements once determined. In all cases, follow up correspondence with the complainant will be made explaining the outcome of the complaint investigations.

In the event that a complaint is received in relation to air quality impacts from the operation, an investigation will be undertaken in accordance with the following:

- UCMPL *Hazard and Incident Reporting Procedures*⁴¹;
- UCMPL *Complaints Procedure*⁴².

Further information on complaints management can be found in Section 3 of the EMS.

4 Greenhouse Management

4.1 Implementation

4.1.1 Objectives

The objectives of the Plan for Greenhouse Gas emissions are to ensure that appropriate procedures and programs of work are in place at the Ulan Mine Complex to:

³⁹ GCAA-625378177-9989.

⁴⁰ ULNCX-111515275-3376.

⁴¹ ULNOC-1105874907-2656, ULNUG-849165555-10446, and ULWUG-729531900-93.

⁴² ULNCX-111515275-3376.

- establish a monitoring system to assess greenhouse gas and energy use performance;
- detail all reasonable and feasible measures to minimise greenhouse gas emissions from the site;
- provide a mechanism to assess monitoring results against greenhouse gas and energy use reporting criteria; and
- manage greenhouse gas related community complaints in a timely and effective manner.

4.1.2 Baseline Data

Greenhouse gas emissions associated with the Ulan Mine Complex have been categorised into Scope 1, 2 and 3 emissions as per The Greenhouse Gas Protocol (2004). The three “scope” categories can be defined as:

- Scope 1, which covers direct emissions from the combustion of fuels (e.g. diesel) and industrial processes within the boundary of the operation;
- Scope 2, which covers indirect emissions from the operation’s consumption of purchased electricity produced by another organization; and
- Scope 3, which includes other indirect emissions as a result of the operation’s activities that are not from sources owned or controlled by the organisation (for example, product transport by rail).

Direct emissions (Scope 1) are produced from sources within the boundary of an operation as a direct result of its activities e.g. combustion of diesel fuels in coal production.

Indirect emissions (Scope 2) are produced outside the boundary of the operation by other organisations but are directly linked to the operation’s on-site activities. Indirect emissions mainly result from the generation of electricity consumed by the operation.

This management plan will focus on Scope 1 and 2 emissions, consistent with the requirements of the Project Approval. The broader contribution by GCAA to the management of Scope 3 emissions is also briefly outlined in this plan.

Forecast emissions indicate that 96% of greenhouse gas emissions will be beyond the scope of this Plan as they are indirect emissions associated with the transportation and combustion of coal products (Scope 3 emissions). Scope 3 emissions are forecast to average 28,480,418 tCO_{2-e} per annum over the life of the mine (SEE, 2009).

Direct emissions (Scope 1) and emissions associated with electricity use (Scope 2) provide an appropriate basis for benchmarking the performance of Ulan Mine Complex, as Scope 1 and 2 emissions can be directly influenced by on-site management actions. Scope 1 and 2 emissions are forecast to average 235,986 tCO_{2-e} per annum over the life of the mine (SEE, 2009). **Table 4-1** below outlines the predictions of Scope 1 emissions during different phases throughout the life of mine. Ulan Coal currently operate in Year 8-11 Project Phase.

Table 4-1 - UCML Scope 1 Emissions Annual Average (SEE, 2009)

Project Phases	Emission Source	Scope 1 Emissions in tCO _{2-e}
Year 1 – Year 7 (Annual Average)	On-site Diesel	31, 663
	Explosives	613

	Methane	194,763
	Slow Ox & Spontaneous Combustion	6,949
Year 8 – Year 11 (Annual Average)	On-site Diesel	7,412
	Explosives	-
	Methane	52,005
	Slow Ox & Spontaneous Combustion	-
Year 12 – Year 20 (Annual Average)	On-site Diesel	3,064
	Explosives	-
	Methane	21,501
	Slow Ox & Spontaneous Combustion	-

Continued operations are forecast to consume an average of 729,981 GJ of energy per annum over the life of the Ulan Mine Complex. On average, the continued operations are forecast to consume 530,505 GJ of electricity and 199,476 GJ of diesel annually. MOD 3 has been predicted to increase Scope 1 emissions by an additional 368,454 tCO_{2-e} and Scope 2 emissions by 145,846 tCO_{2-e} over the life of mine. Further to this, MOD 4 is forecast to increase Scope 1 emissions by 27,535 tCO_{2-e} and Scope 2 emissions by 65,763 tCO_{2-e} over the life of mine.

The current Ulan Coal operations are considered “*non-gassy*”, as relatively low levels of Carbon Dioxide and Methane levels are produced and below reliable detection limits. The statutory ventilation surveys completed at Ulan Coal during 2009/10 state that Carbon Dioxide levels in the underground ventilation system range between 0 - 0.04% CO₂. During 2009/10, the ventilation survey at Ulan Coal measured the production of approximately 946,080 m³ of fugitive gas or 0.2 m³/tonne. Fugitive gas production rates of 0.2 m³/tonne are extremely low given that Australian coal seam gas contents range between <1.0 m³/tonne to 30 m³/tonne (ACARP, 2010).

SEE Sustainability (2009) advise that the predicted maximum greenhouse index for on-site activities is 0.029 tCO_{2-e}/tonne of product coal, which is significantly less than the Australian coal mining industry average of 0.079 tCO_{2-e}/tonne. This is primarily due to the ‘*non-gassy*’ nature of the underground mines, i.e. they produce low levels of methane compared to other mines combined with the comparatively low energy intensity associated with Ulan’s operations. The methane emissions factor for the underground operations is 0.17 kg per Tonne ROM, which is significantly lower than other ‘*non-gassy*’ coal mines (SEE, 2009). The typical factor reported for ‘*non-gassy*’ coal mines from the *National Greenhouse Accounts Factors June 2009* is 0.38 kg methane per Tonne ROM.

4.1.3 Greenhouse Gas Impact Assessment Criteria

4.1.3.1 National Greenhouse and Energy Reporting System

UCMPL are required to report greenhouse gas emissions to comply with the *National Greenhouse and Energy Reporting Act 2007* (Cth) (NGER Act) and subordinate legislation (collectively NGERS) as its parent company (AZSA Holding Pty Ltd) triggers corporate reporting thresholds and the site triggers individual facility thresholds. The NGER Act requires individual sites to report greenhouse gas emissions, energy consumption and energy production, via the Emissions and Energy Reporting System (EERS), if one of the following threshold criteria is met:

1. the site generates greenhouse gases (Scope 1 and 2) in excess of 25,000 tCO₂-e; or
2. the site consumes in excess of 100 TJ of energy; or
3. the site produces in excess of 100 TJ of energy.

The six greenhouse gases that must be assessed and reported under NGERS include:

- Carbon dioxide (CO₂)
- Methane (CH₄);
- Nitrous oxide (N₂O);
- Sulphur hexafluoride (SF₆);
- Hydrofluorocarbon (HFC) - of a kind specified in the NGER Regulations; and
- Perfluorocarbon (PFC) - of a kind specified in the NGER Regulations.

Data is captured through completion of the SAP ERS data requirements with records of raw data and verification maintained on-site. GCAA uses applicable methods to calculate GHG emissions and energy consumption. UCMPL estimates statistical uncertainty using a standard form and maintains an Energy and Emissions Inventory, that includes the energy consumption and production and GHG emission sources that occur as a result of the activity categories as well as NGERS Facility Process Maps. Records of energy consumption, energy production, emission data and estimations are retained for a minimum of seven (7) years from the end of the reporting period in which the activities took place.

4.1.3.2 Greenhouse Gas Performance Measures

As UCMPL is not predicted to emit over 100kt CO₂-e from Scope 1 emissions (the threshold required to be registered as a Safeguard Facility) UCMPL has no baseline threshold and UCMPL are not required to commit to specific greenhouse gas performance targets under legislation, industry codes of practice or GCAA Standards.

The initial reported baseline for Ulan Coal between 2009-10 and 2013-14 was 123,668 CO₂-e. As this was a reported baseline, this number is historical and is no longer applicable. The recalculated baseline is <100,000. This is a more conservative and accurate baseline number.

UCMPL will, however, commit to developing and reporting greenhouse gas intensity (tCO₂-e/ROM tonne) and energy use intensity (GJ/ROM tonne) indicators on an annual basis. The performance is compared with energy and greenhouse gas intensity forecast for the project in the Environmental Assessment and reported in the Annual Review commencing in 2024.

UCMPL's greenhouse gas performance targets are derived from Glencore's objective to achieve a reduction of 15% by 2026 and a reduction of 50% by 2035 of Scope 1, 2 and 3 emissions based on 2019 greenhouse gas emissions. Glencore's long-term target is to achieve net zero total emissions by

2050. UCMPL are exploring a number of options to reduce Scope 1 emissions including consideration of lower emission fuels and conversion from diesel to electric equipment where possible.

4.1.4 Greenhouse Gas Management Controls

UCMPL implements all reasonable and feasible management controls to mitigate Scope 1 and 2 greenhouse gas emissions associated with the site, during the design operation and decommissioning stages of the project. The primary sources of greenhouse gas identified at the Ulan Mine Complex are:

- electricity consumption;
- fuel combustion;
- fugitive emissions;
- waste water emissions; and
- gas insulated switch gear (SF₆ leakage).

Greenhouse gas emissions can be managed through project design, procurement processes and project operation. The management controls implemented at the Ulan Mine Complex will be initiated at both corporate and site levels. The following sections include a combination of corporate and site based greenhouse gas management controls.

4.1.4.1 Design Controls

The preferred Ulan West mine concept was selected based on operational efficiency and development cost. The concept selected for further assessment was based on a very simple design that reduced the number of drive headings, minimised the size of the ventilation system and shortened travel distances. The design process included specific consideration of energy efficiency and greenhouse gas emissions. The design of the Ulan West mine plan considered an energy efficiency design review and greenhouse gas issues / constraints / opportunities. The energy efficiency design review included the design of surface operations, the surface coal clearance system and underground operations. UCMPL completed the following process as part of the energy efficiency design review:

1. review aim and motivating factors;
2. review design documentation of the mine area;
3. brainstorm and generate energy efficiency ideas;
4. review energy efficiency checklists; and
5. document actions and ideas.

The final Ulan West mine design includes many design aspects which will improve energy use efficiency and mitigate greenhouse gas emissions. Energy efficiency has been considered in the design of the following site infrastructure:

- site buildings;
- compressed air systems;
- the bathhouse;
- all electrical equipment (including motors / drives for conveyors, pumps and compressors);
- outdoor lighting;

- water management systems;
- coal handling lighting;
- coal handling conveyors;
- the electrical power distribution system;
- the ROM stockpile;
- the Longwall layout; and
- underground lighting.

The following design components were included in the design of the site infrastructure:

- centralised air conditioning;
- insulated buildings;
- passive design;
- direct drives;
- variable speed drives;
- high efficiency motors;
- active filters to address harmonics on variable speed drives;
- photoelectric cell controls on lighting;
- power factor correction equipment;
- location of sub-stations; and
- multiple electrical circuits.

All tender documentation and tender evaluation processes prepared for the construction of Ulan West included specific energy efficiency criteria.

4.1.4.2 Procurement

Site procurement processes require all procurements to be approved via an Application for Expenditure (AFE). An AFE requires assessment of environmental factors, including documenting any significant environmental risks or benefits.

The following excerpt from an AFE completed by UCMPL demonstrates how UCMPL will consider energy efficiency during the procurement process. An AFE completed by UCMPL for the purchase of three new bulldozers included the following energy efficiency study.

“The D11T dozer has greater fuel efficiency than the currently operating dozers with a diesel burn rate 26 litres per hour lower than the N series D11. The replacement of three dozers is expected to save approximately 402,480 litres of diesel per year. The Caterpillar D11T meets EPA Tier 2 and EU Stage II engine exhaust emissions regulations”.

4.1.4.3 Operational Controls

Operational greenhouse gas management controls will be evaluated and implemented at both corporate and site levels.

Corporate Controls

GCAA requires all sites to review their life of mine planning on an annual basis. As part of this process, sites are required to reforecast future greenhouse gas emissions and review greenhouse gas and energy reduction opportunities.

Fugitive Emissions

As described in **Section 4.1.2**, the Ulan Mine Complex is a “non-gassy” mine which will only produce very low levels of fugitive emissions. Management controls to address fugitive emissions will be evaluated by GCAA as part of an annual process for allocating capital expenditure across the NSW Division.

Common fugitive emission management controls such as flaring, methane capture and energy production have been considered for the Ulan Mine Complex; however, internal evaluation has either deemed the technologies technically unfeasible or very low priority due to their relative cost of abatement.

The Ulan Mine Complex underground workings do not require pre-drainage to manage methane levels. Without a pre-drainage system supplying high concentrations of methane it is not technically feasible to flare methane and/or capture methane for energy production. It may be technically possible to install a thermal flow reversal reactor (TFRR) to oxidise low methane concentrations in the air flow exhausted from the underground ventilation system, however, an equivalent investment at a gassy site would generate a better greenhouse gas control outcome for GCAA and the environment.

Waste

General waste produced at the Ulan Mine Complex is managed and processed at the Mudgee Waste Management Facility. The GCAA NSW *Waste Management Protocol*⁴³ and the Ulan Mine Complex *Waste Management Plan*⁴⁴ requires UCMPL to recycle paper, cardboard and timber as well as a range of other materials e.g. steel, printer cartridges, waste oil etc. Recycling diverts organic material from landfill and reduces potential methane emissions.

UCMPL also operates two aerobic waste water management treatment plants, which are the most cost effective way of managing greenhouse gas emissions from waste water.

Industrial

A very small proportion of greenhouse gas emissions are generated by gas (Sulphur Hexafluoride - SF₆) insulated switch gear installed at the Ulan Mine Complex. Installing SF₆-free switch gear is the only option for controlling SF₆ emissions from switch gear. The installation of SF₆-free switch gear will be considered in line with GCAA’s procurement process as new switch gear is installed and/or replaced.

Decommissioning and Mine Closure

Decommissioning of the mining operations and associated surface facilities associated occurs progressively throughout the life of the mine, in accordance with conditions of relevant mining titles. This includes progressive decommissioning of mine entries, ventilation fans, ventilation shafts, borehole facilities and associated surface facilities. A decommissioning plan will be prepared for each stage as part of the extraction plan and/or rehabilitation management plan process.⁴⁵

4.1.4.4 Prioritising Energy and GHG Management Controls

To prioritise the implementation of energy and greenhouse gas management controls, technical review and marginal cost of abatement are used to evaluate the controls through the AFE process where applicable. Options and alternatives are documented, Net Present Value (NPV) calculations

⁴³ GCAA-625378177-10249.

⁴⁴ ULNCX- 111515275- 98.

⁴⁵ ULNCX-111515275-3700 Rehabilitation Management Plan. .

should be completed over the useful life of the option and include capital expenditure, operational expenditure and forecast savings / revenue and where technically feasible, (i.e. significant technical barriers to implementation might exist that prevent the selection of the alternative) and energy and greenhouse gas savings (tCO₂-e) estimated if appropriate.

Table 4-2 A framework for prioritising greenhouse gas management options

Action	Priority	Cost	GHG Mitigation
		\$/tCO ₂ -e	tCO ₂ -e
GHG management option 1	1	\$NPV/Mitigation Potential	Mitigation Potential
GHG management option 2	2	\$NPV/Mitigation Potential	Mitigation Potential
GHG management option 3	3	\$NPV/Mitigation Potential	Mitigation Potential

Reasonable and feasible greenhouse gas management controls will be implemented.

4.1.4.5 Continuous Improvement

NGERS management review is undertaken on an annual basis by GCAA and assesses the following:

- activities at facilities, changes to operations and implementation of new equipment, materials or processes to ensure that these changes have been captured as part of NGER’s reporting;
- GHG generating activities, fuel and non-fuel types;
- GHG abatement and efficiency improvement activities;
- impact of new legislation, changes to existing legislation and implementation of the required changes;
 - approval/sign-off of all baseline, emissions and abatement calculations;
 - approval/sign-off of all documentation associated with GHG; and
 - review of quality control procedures.

4.1.4.6 Scope 3 Greenhouse Gas

The Greenhouse Gas Protocol refers to downstream greenhouse gas emissions as a result of combustion of coal products from the Ulan Mine Complex as scope 3 emissions. UCMPL is unable to directly manage Scope 3 emissions as UCMPL does not have operational control of its customer’s facilities. While UCMPL are not in a position to manage Scope 3 emissions directly, product stewardship and market development programs may contribute to reductions in Scope 3 emissions

4.2 Measurement and Evaluation

4.2.1 Greenhouse Gas Monitoring Program

UCMPL will monitor greenhouse gas emissions, energy use and energy production by direct monitoring and modelling from activity data. The greenhouse gas monitoring program will require direct measurement of fugitive emissions and the collation of activity data such as energy use, coal production and waste disposal.

The UCMPL greenhouse gas and energy use monitoring program will be undertaken across a number of business units at UCMPL. All greenhouse gas emissions and activity use data are monitored for multiple purposes through established systems. **Table 4-3** outlines how greenhouse gas and energy

use monitoring will be achieved across multiple systems. **Table 4-4** outlines how energy production will be monitored across multiple systems.

Table 4-3 Greenhouse gas and energy use monitoring systems

Emission / Energy source	Activity data / Direct measurement	Monitoring system
Fuel Combustion	Diesel (Stationary)	Monthly fuel reconciliation return
	Diesel (Transport)	
	Petrol (Stationary)	
	Petrol (Transport)	Monthly fuel reconciliation return Monthly fuel reconciliation return
	Oils and Greases (Stationary)	Monthly fuel reconciliation return
	Oils and Greases (Transport)	SAP report
	Oils and Greases (Recycled)	SAP report
		Monthly waste report
Fugitive Emissions	CO ₂ from ventilation shafts	Ventilation surveys
	CH ₄ from ventilation shafts	
Industrial Processes	SF ₆ from gas insulated switch gear	Underground safety files
Waste	Solid waste to landfill	Monthly waste report
	Waste water handling	Citect Environmental Monitoring reports
Scope 2 Emissions	Electricity use	Energy provider Invoices

UCMPL uses a Supervisory Control And Data Acquisition (SCADA) system, known as Citect, to monitor the condition and status of water pumps, gas ventilation systems and stream flow monitors. The real time data recorded by Citect is aggregated, analysed and reported internally. Citect data is used to inform evaluation of environmental performance and external reporting processes.

Table 4-4 Energy production monitoring systems

Energy source	Activity data / Direct measurement	Monitoring system
Fuel Production	Washed Coal	Weightometers

4.2.1.1 Monitoring Standards

The GCAA *Carbon Management Protocol*⁴⁶ and *Environmental Data Reporting Protocol*⁴⁷ provide specific monitoring standards for monitoring greenhouse gas emissions, energy use and energy production. GCAA Protocols are based on the monitoring standards specified in the NGRS Measurement Technical Guidelines. UCMPL will adopt the following GCAA Protocols when monitoring greenhouse emissions and activity data:

⁴⁶ GCAA-625378177-13662 11.13.

⁴⁷ GCAA-625378177-10274 11.01.

- Measurement of fugitive emissions from (underground) coal mines.
- Reporting of ROM product coal for fugitive estimation and energy production.
- Measurement of liquid fuels and petroleum based oils and greases.
- Electricity use.
- Industrial processes.
- Waste.

4.2.1.2 Process Maps

UCMPL have prepared and implemented process maps to identify all energy inputs and emission sources. GCAA *Environmental Reporting Protocol*⁴⁸ requires all sites to map energy use and emission sources to help identify greenhouse gas data sources. Process maps will be updated annually and the review process will highlight new / redundant data sources.

4.2.1.3 Monitoring Records

To comply with the NGER Act, all sites are required to retain records of energy consumption, energy production, emissions data and estimations for a minimum of seven (7) years from the end of the reporting period in which the activities took place.

UCMPL has developed procedures for the collection and retention of data to ensure the site complies with the legislative requirements of the NGER Act.

4.2.2 Reporting

UCMPL will report greenhouse gas emissions and energy use both internally and externally. Internal reporting systems allow divisional groups to evaluate the performance of energy efficiency programs and comply with corporate greenhouse reporting requirements (NGER is reported at a corporate level). Internal reporting also allows GCAA to report HSEC performance externally in programs such as the Global Reporting Index (GRI).

4.2.2.1 Internal

GCAA maintains global internal reporting systems called SAP ERS and Glencore Corporate Practice (GCP). SAP ERS and GCP are web based systems for collecting data and reporting sustainable development and greenhouse performance. UCMPL will report greenhouse gas activity data internally via SAP ERS according to the schedule outlined in **Table 4-5**.

Table 4-5 GCP reporting intervals

Activity Data	Reporting Interval
SF ₆ leakage	Annually
CO _{2-e} for stockpiled coal	Quarterly
Methane vented from ventilation systems	Quarterly
CO ₂ vented from ventilation systems	Quarterly
Waste water to on-site treatment plant/reuse	Quarterly

⁴⁸ GCAA-625378177-10274 11.01.

Electricity purchased	Quarterly
Diesel non-transport	Quarterly
Diesel transport	Quarterly
Petroleum based fuels consumed but not combusted	Quarterly
Biodiesel use	Quarterly
Petrol/gasoline non-transport	Quarterly
Petrol gasoline transport	Quarterly
Other liquid fuels	Quarterly
Diesel for explosives	Quarterly
Waste oil for explosives	Quarterly
General waste to landfill	Quarterly
Paper and cardboard recycled	Quarterly
Machined timber recycled	Quarterly
Green / garden waste to compost	Quarterly
Sludge to landfill	Quarterly
Pallets recycled	Quarterly

4.2.2.2 External

UCMPL will report its annual greenhouse gas emissions via the EERS, which is a Commonwealth Government website. Greenhouse gas emissions from the Ulan Mine Complex are reported as a single facility under the control of AZSA Holdings Pty Ltd.

4.2.2.3 Management of Unpredicted Emissions

Identifying unpredicted greenhouse gas emissions is an important process for identifying corrective actions, improving future emission estimates and managing community concerns. UCMPL will identify unpredicted greenhouse gas emissions by comparing its accumulated emissions, with the original greenhouse gas projections completed for the Environmental Assessment.

UCMPL will monitor its accumulated Scope 1 and 2 emissions via the NGERs reporting process. To compare the accumulated Scope 1 and 2 greenhouse gas emissions with the original Scope 1 and 2 greenhouse gas projections in the Environmental Assessment, UCMPL may have to adjust reported emissions to ensure that the accumulated emissions are based on comparable emission factors and underlying assumptions as the original projections.

4.2.2.4 Management of Non-Compliance

GCAA has a target of zero fines, penalties or prosecutions. Failure to comply with the NGERs reporting requirements is a potential non-compliance risk for UCMPL. GCAA has systems and procedures in place to manage the NGERs reporting compliance risks. The GCAA *Environmental Reporting*

Protocol⁴⁹ requires all sites to collect data, verify data and complete EERS prior to 31 October each year.

Further information on non-compliance can be found in Section 4 of the EMS.

5 Review and Improvement

Ongoing monitoring and review on the performance and implementation of the Air Quality and Greenhouse Gas Management Plan (AQGHGMP) are undertaken in accordance with the EMS⁵⁰.

The AQGHGMP is to be reviewed in consultation with DPE, EPA and MWRC, as required by recommendations arising from the Independent Environmental Audit, or after any significant changes to the operation. The review will reflect changes in environmental expectations, technology and operational procedures.

UCMPL will review, and if necessary revise, the strategies, plans, and programs required under PA 08_0184 to the satisfaction of the Secretary within 3 months of:

- a) the submission of an annual review⁵¹;
- b) the submission of an incident report⁵²;
- c) the submission of an audit report⁵³; and
- d) any modification to the conditions of this approval, (unless the conditions require otherwise).

6 Accountabilities

Role	Accountabilities for this document
Operations Manager	<ul style="list-style-type: none"> • Approve appropriate resources for the implementation of this Plan • Ensure the effective implementation of strategies designed to reduce air quality impacts and GHG emissions from the operation. • Ensure any potential or actual air quality and GHG issue is reported in accordance with legal requirements and the corporate standard. • Authorise internal and external reporting requirements of this plan • Approve subsequent revisions of this plan • Authorise the implementation of GHG management controls • Ensure effective GHG and energy use monitoring systems are implemented in accordance with internal and external monitoring standards and protocols.

⁴⁹ GCAA-625378177-10274 11.01.

⁵⁰ ULNCX-111515275-870 Environmental Management Strategy.

⁵¹ Project Approval 08_0184 Schedule 5, Condition 3.

⁵² Project Approval 08_0184 Schedule 5, Condition 6

⁵³ Project Approval 08_0184, Schedule 5, Condition 8

Role	Accountabilities for this document
Environment and Community Manager	<ul style="list-style-type: none"> • Provide that sufficient resources are allocated for the implementation of this program. • Ensure appropriate resources are budgeted for to enable appropriate monitoring and management of air quality and GHG. • Ensure that air quality and energy efficiency considerations are undertaken in the installation of all new infrastructure and purchase of equipment for the operation. • Identify air quality and GHG management risks and impacts to the environment and assess resources required to mitigate identified risks and impacts within the site. • Ensure that the air quality and greenhouse gas management controls are implemented in accordance with this Plan. • Ensure that the results of monitoring are evaluated and reported to senior management and to relevant personnel for consideration as part of ongoing mine planning. • Ensure any potential or actual air quality or GHG issue is reported in accordance with legal requirements and the corporate standard. • Provide visible and proactive leadership in relation to the air quality management. • Ensure that operational changes consider the potential air quality impacts to adjacent private landowners. • Ensure all internal and external reporting requirements are met, including incident reporting in accordance with EMS. • Ensure all reporting complies with internal and external monitoring standards, protocols and regulations. • Proactively engage government and community as required • Coordinate the ongoing review of this Plan • Review and approve external reports e.g. Annual Review Report, prior to final approval by the Operations Manager • Establish TEOM trigger levels, in consultation with EPA • Coordinate progressive rehabilitation to minimise disturbed areas • Contact point for Community Complaints in accordance with ULNCX-111515275-3376– Complaints Procedure.

Role	Accountabilities for this document
Environment & Community Coordinator	<ul style="list-style-type: none"> • Manage and maintain the air quality monitoring programs in accordance with this plan • Ensure monitoring equipment is operated in accordance with relevant industry standards and protocols • Ensure that all monitoring records are effectively maintained on site in accordance with the EMS • Coordinate the collation and evaluation of monitoring data • Conduct periodic environmental inspections in accordance with the EMS • Ensure any potential or actual air quality or GHG management issue, including incidents and non-compliance is reported to the ECM • Coordinate incident investigation processes including associated reporting requirements, in accordance with the EMS • Coordinate the implementation of any corrective actions and evaluate their effectiveness • Provide visible and proactive leadership in relation to air quality and GHG management. • Participate in the ongoing review of this Plan • Ensure effective management of all community complaints • Conduct periodic environmental inspections of UCMPL's buffer lands to identify any air quality management issues. • Manage access and lease agreements for ongoing management of air quality monitoring equipment. • Proactively engage government and community as required.
Environment & Community Officer	<ul style="list-style-type: none"> • Upload copies of updated management plans to the UCMPL website. • Update monitoring data on the UCMPL internet site. • Ensure any potential or actual air quality management issue, including incidents and non-compliance is reported to the ECM. • Regularly report environmental performance to ECM • Prepare internal and external reports for review by ECM • Coordinate the collation and evaluation of monitoring data • Ensure that all monitoring records are effectively maintained on site in accordance with the EMS • Ensure all reporting complies with internal and external monitoring standards, protocols and regulations.

Role	Accountabilities for this document
All Supervisors	<ul style="list-style-type: none"> • Provide that sufficient resources are allocated for the implementation of this Plan, as required. • Ensure adequate resources are budgeted for in relation to air quality and GHG monitoring for their task/project. • Implement and manage changes through UCMPL's Change Management process. • Include assessment of air quality impacts and energy efficiency in the purchase of new equipment and infrastructure for the project. • Ensure that operational changes consider the potential impacts of dust emissions from the project on the surrounding environment and adjacent private landowners. • Monitor that team members and contractors carry out work appropriate monitoring and maintenance tasks. • Ensure any potential or actual air quality or GHG management issue is controlled. • Ensure any potential or actual air quality or GHG management issues, including environmental incidents, are reported to the ECM. • Conduct regular inspections of the work area to monitor compliance with this plan. • Provide input to management on the adequacy and effectiveness of this plan. • Ensure the effective implementation of strategies designed to reduce air quality and GHG impacts from the project. • Provide visible and proactive leadership in relation to air quality management. • Ensure personnel working at the operation are aware of the air quality and GHG management obligations whilst working with UCMPL.

Role	Accountabilities for this document
Project Manager	<ul style="list-style-type: none"> • Provide that sufficient resources are allocated for the implementation of this Plan, as required. • Ensure adequate resources are budgeted for in relation to air quality and GHG monitoring for their task/project. • Implement and manage changes through UCMPL's Change Management process. • Include assessment of air quality impacts and energy efficiency in the purchase of new equipment and infrastructure for the project. • Ensure that operational changes consider the potential impacts of dust emissions from the project on the surrounding environment and adjacent private landowners. • Monitor that team members and contractors carry out work appropriate monitoring and maintenance tasks. • Ensure any potential or actual air quality or GHG management issue is controlled. • Ensure any potential or actual air quality or GHG management issues, including environmental incidents, are reported to the ECM. • Conduct regular inspections of the work area to monitor compliance with this plan. • Provide input to management on the adequacy and effectiveness of this plan. • Ensure the effective implementation of strategies designed to reduce air quality and GHG impacts from the project. • Provide visible and proactive leadership in relation to air quality management. • Ensure personnel working at the operation are aware of the air quality and GHG management obligations whilst working with UCMPL.

Role	Accountabilities for this document
Surface Projects Coordinator	<ul style="list-style-type: none"> • Provide that sufficient resources are allocated for the implementation of this Plan, as required. • Ensure adequate resources are budgeted for in relation to air quality and GHG monitoring for their task/project. • Implement and manage changes through UCMPL's Change Management process. • Include assessment of air quality impacts and energy efficiency in the purchase of new equipment and infrastructure for the project. • Ensure that operational changes consider the potential impacts of dust emissions from the project on the surrounding environment and adjacent private landowners. • Monitor that team members and contractors carry out work appropriate monitoring and maintenance tasks. • Ensure any potential or actual air quality or GHG management issue is controlled. • Ensure any potential or actual air quality or GHG management issues, including environmental incidents, are reported to the ECM. • Conduct regular inspections of the work area to monitor compliance with this plan. • Provide input to management on the adequacy and effectiveness of this plan. • Ensure the effective implementation of strategies designed to reduce air quality and GHG impacts from the project. • Provide visible and proactive leadership in relation to air quality management. • Ensure personnel working at the operation are aware of the air quality and GHG management obligations whilst working with UCMPL.
All Employees & Contractors	<ul style="list-style-type: none"> • Ensure the effective implementation of this Plan with respect to their work area. • Ensure any potential or actual air quality management issues, including environmental incidents, are reported to the Project Manager, Supervisor or Task Coordinator. • Ensure equipment (relevant to task/area of responsibility) is maintained and operated in a proper and efficient manner. • Report energy usage to ECC when requested (contractors). • Where practicable, prevent the tracking of material onto sealed roads by washing material off vehicles prior to exiting site.
Technical Services Manager	<ul style="list-style-type: none"> • Coordinate the implementation of the air quality and greenhouse gas management controls with respect to the underground ventilation system.

7 Document Information

Relevant legislation, standards and other reference information must be regularly reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

7.1 Definitions

Definitions within this document are listed in **Table 7-1** below.

Table 7-1 Definitions

Term	Definition
ACARP	Australian Coal Association Research Program
AR	Annual Review
Aerobic waste water management	Wastewater that is treated in aerated effluent ponds.
AFE	Application for Expenditure
AQS	Air Quality System
AS	Australian Standard
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
CMO	Corporate Management Operating System
Direct emissions	Direct emissions occur from sources that are owned or controlled by an organisation.
Downstream	At a later point in the production process.
DPE	NSW Department of Planning, and Environment
DPI	Department of Primary Industries
EA	Environmental Assessment (Umwelt 2009)
EMS	Environmental Management Strategy (ULNCX- 111515275- 870)
EPA	Environmental Protection Agency
EP&A	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environment Protection Licence (394)
DRE	Department of Resources and Energy
Flaring	A process of combusting waste gas which is otherwise not feasible to use or transport.
GHG	Greenhouse Gas
GCAA	Glencore Coal Assets Australia
GCP	Glencore Corporate Practice
GRI	Global Reporting Index - A network-based organisation that discloses environmental, social and governance performance using an internationally accepted sustainability reporting framework.
HSEC	Health Safety Environment and Community

Term	Definition
HVAS	High Volume Air Sampler
Indirect emissions	Emissions that are a consequence of the operations of the reporting organisation, but occur at sources owned or controlled by another organisation.
Methane capture	The storage of extracted or vented fugitive methane.
LGA	Local Government Area
MCM	Moolarben Coal Mine
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
MWRC	Mid Western Regional Council
NPV	Net Present Value, which is the sum of future cash flows which have been discounted based on the time value of money.
NGER Act	<i>National Greenhouse and Energy Reporting Act 2007</i>
NGERS	National Greenhouse and Energy Reporting System
Non-gassy	An underground mine that has at least 0.1% methane in the mines return ventilation.
PM ₁₀	Particulate Matter <10µm in size
POEO	<i>Protection of the Environment Operations Act 1997</i>
Pre-drainage	A process for removing mine gas from a coal bearing strata before the strata is mined.
ROM	Run of Mine
SCADA	Supervisory Control and Data Acquisition
Scope 1	A reporting organisation's direct greenhouse gas emissions.
Scope 2	A reporting organisation's emissions associated with the generation of electricity.
Scope 3	A reporting organisation's indirect emissions other than those covered in Scope 2.
TARP	Trigger Action Response Plan
TEOM	Tapered Element Oscillating Microbalance
tCO _{2-e}	Tonnes of carbon dioxide equivalent, which is a measure that allows you to compare the emissions of other greenhouse gases relative to one unit of CO ₂ .
TFRR	Thermal Flow Reversal Reactor
TSP	Total Suspended Particulates
UCMPL	Ulan Coal Mines Pty Limited
USO	Ulan Surface Operations
WCM	Wilpinjong Coal Mine

7.2 Reference Information

Reference information, listed in **Table 7-2** below, is information that is directly related to the development of this document or referenced from within this document.

Table 7-2 Reference information

Reference	Title
Legislation / Regulation	Protection of the Environment Operations Act 1997
	Environmental Planning and Assessment Act 1979
	The Protection of the Environment Operations (Clean Air) Regulation 2010
	National Greenhouse and Energy Reporting Act 2007
	National Greenhouse and Energy Regulations 2008
	National Greenhouse and Energy Reporting (Measurement) Determination
	Energy and Utilities Administration Act 1987 Part 6A
Australian Standards	AS3580.14 Methods for sampling and analysis of ambient air: Meteorological monitoring for ambient air quality monitoring applications. (Guide for measurement of horizontal wind for air quality applications)
	AS/NZS 3580.9.3: Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – total suspended particulate matter (TSP) – High-volume sampler gravimetric method (Particulate matter – TSP – high-volume sampler method)
	AS 3580.9.8 Methods for sampling and analysis of ambient air: Determination of suspended particulate matter – PM ₁₀ Continuous direct mass method using a tapered element oscillating microbalance analyse (Particulate matter – PM ₁₀ – TEOM)
Glencore Coal Assets Australia Guidelines	GCAA-625378177-9979 12.0 Change
	GCAA-625378177-10296 10.05 Community Complaint Management
	GCAA-625378177-9978 11.0 Environment
	GCAA-625378177-10294 10.01 Stakeholder Engagement
	GCAA-625378177-9992 6.0 Incident
	GCAA-625378177-4600 11.15 Land Acquisition and Compensation.
	GCAA-625378177-10328 11.20 Statutory Approvals - NSW
	GCAA-625378177-10274 11.01 Environmental Reporting
	GCAA-625378177-18413 11.08 Waste Management
	GCAA-625378177-10324 11.10 Air Quality Management
	GCAA-625378177-10237 11.09 Exploration and Drilling
GCAA-625378177-13662 11.13 NGER Protocol	
UCMPL	Document Control Procedure (ULNOC-1105874907-2299 , ULNUG-849165555-5689 , ULWUG-729531900-128)
	Environmental Management Strategy (ULNCX- 111515275- 870)
	Complaints Procedure (ULNCX-111515275-3376)
	Hazard and Incident Reporting Procedure (ULNOC-1105874907-2656 , ULNUG-849165555-10446 , ULWUG-729531900-93)
	Stakeholder Engagement Plan (ULNCX-111515275-3537)

	Waste Management Plan (ULNCX- 111515275- 98)
	Spontaneous Combustion Principal Hazard Management (ULNOC-1105874907-2690)
	Blast Management Plan (ULNCX-111515275-1953)
	Training and Competency Management Standard (ULNOC-1105874907-1747, ULNUG-849165555-5762, ULWUG-729531900-105)
	Dust Management Procedure (ULNCX-111515275-1940)
	Post Blast Fume Procedure (ULNOC-1105874907-6670)
	Rehabilitation Management Plan (ULNCX-111515275-3700)
	Data Sharing Deed Ulan, Moolarben and Wilpinjong
External	Moreby, R., Balusu, R., Yarlagadda, S., Ren, T. And Su, S., 2010. Strategic review of gas management options for reduced GHG emissions. ACARP 2010.
	SEE Sustainability Consulting, 2009. Ulan Coal Continued Operation Project. Scope 1, 2 & 3 Energy and Greenhouse Gas Assessment.
	Umwelt, 2009 Ulan Coal Continued Operations Environmental Assessment (October 2009)
	Umwelt (2011) Ulan Coal Continued Operations North 1 Underground Mining Area, Minor Modification to Ulan No.3 & Ulan West Mine Plans & Proposed Concrete Batching Plant
	Umwelt (May 2012) Environmental Assessment Modification to Ulan Coal Continued Operations, Ulan West Mine Plan (Approved Panels 1 – 4) and Construction Blasting
	World Business Council for Sustainable Development / World Resources Institute, 2004. The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard
	EPA publication Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2007)
	Eco Logical (2018) Environmental Assessment Modification to Ulan Continued Operations, Longwall Optimisation Project (January 2018).

7.3 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in **Table 7-3** below.

Table 7-3 Change information

Version	Date	Review team (consultation)	Change Summary
1	31 March 2011	Jamie Lees, Cheryl Henriques, Stephen Bragg, Matthew Newton (Umwelt), Malcolm Sedgwick (Umwelt), Luke Bettridge (Umwelt)	New Management Plan developed to meet requirements of new Project Approval 08-0184.
2	1 April 2011	Cheryl Henriques	Formatting – no change to content
3	8 July 2011	Umwelt, Cheryl Henriques, Jamie Lees	Updated following comments from DoPI
3.1	23 April 2012	Matthew Di Marco, Ian Flood, Rachel Murray	Annual Review - Updated in accordance with The Air Quality Risk Assessment completed by GSSE,

Version	Date	Review team (consultation)	Change Summary
			and based on upon Mod 1, 2 and EPL394 variation
3.4	10 June 2013	Tara Stokes, Robyn Stoney	AER 2012 Management Plan Review
3.5	28 June 2015	Tom Frankham, Robyn Stoney	The document was updated to meet the intent of the Glencore air quality management and carbon management protocol. References to the repealed energy efficiency opportunities and energy savings action plan legislation and annual review of energy and greenhouse reduction opportunities were removed. Greenhouse minimisation requirements are captured through ongoing project and Life of Mine assessment processes.
4	11 May 2016	Angela van der Kroft	Annual Review - Updated in accordance with MOD3 and EPL394 variation
4.1	10 June 2016	Bianca Connop	Update to maps on accordance with MOD3
4.2	14 June 2016	Angela van der Kroft	Final updates in accordance with MOD3 prior to submission DPE
5.0	4 November 2016	Tara Stokes	Changed effective date to 28/10/2016 when version approved by DPE
6.0	June 2018	Robyn Stoney	Updates to remove DA113-12-98, administrative changes, update legislative requirements
6.3	February 2019	Tara Stokes, Kellie Smith	Removed Section 3.1.4 which is covered by Dust Management Procedure. Minor changes to other

Version	Date	Review team (consultation)	Change Summary
			content including updating references.
7.0	April 2019	Robyn Stoney, Robbie Mills	Minor review following DPE feedback April 2019. Version approved 15/05/2019.
7.1	September 2019	Kellie Smith	Update following approval of Modification 4 on 17 July 2019. Note that the 2019 audit and the 2018 Annual review identified regional dust exceedances and associated reporting, and additional padding for dust deposition gauges but that no changes to this management plan were identified in response to those issues.
7.2	May 2020	Kellie Smith	Removal of requirement to monitor depositional dust via depositional dust gauges due to the variation of EPL 394 by the EPA.
7.3	August 2020	Jake Hawkins	Updated Ulan Coal Mines Limited (UCML) to Ulan Coal Mines Pty Limited (UCMPL), and Department of Planning and Environment (DP&E) to Department of Planning, Industry and Environment (DPE) as advised by the EPA (5 August 2020).
7.4	September 2020	Jake Hawkins	MOD 5 administrative changes, inclusion of MOD5 approval and updated operations plan layout.
8	10 November 2020.	Robbie Mills	Approved Plan. Formatting only; transferred document into new template, no changes to content.
8.1	19 July 2021	Kellie Smith	Annual review of the Plan. Additional

Version	Date	Review team (consultation)	Change Summary
			explanation of MOD4 and MOD5 approval. Administrative changes including formatting and referencing for consistency throughout the Plan. Removal of "OCE" and replacement with "Mining Supervisor" for consistency with site position description. Minor amendment to air quality management procedures in accordance with site procedures, and weather monitoring systems.
8.2	31 May 2022	Kellie Smith	Finding from 2021 GCAA Internal Review. Revised section 4.1.4.2 wording to document actual site practices, and updated section 4.1.4.5 to document NGER management review is undertaken on an annual basis by GCAA.
8.3	22 November 2022	Kellie Smith	Review and update after completion of internal legal compliance audit, Independent Environmental Audit and Annual Review. Updates include reference to Modification 7, update to references to internal documents, update of Australian Standards to meet updated EPA approved methods of sampling and analysis, addition of most recent DPE approval correspondence at Appendix A, update reference to DPE (formerly DPIE).
8.4	20 June 2023	Kellie Smith	Update to include further information required in RFI MP08_0184-PA-81

Version	Date	Review team (consultation)	Change Summary
			requested by DPE dated 9 May 2022. Addition of a Weather and Dust TARP at Appendix B.
9.0	29 July 2024	Jessica Taylor	<p>Updated to include further information required in RFI MP08_0184-PA-81 dated 14 March 2024. Updates include minor administrative changes, addition of Table 4-1, detail of site level initiatives that align with Glencore’s net zero target, outline of dust control measures during exploration and administrative changes to action responses within the TARP.</p> <p>This plan is approved by Department of Planning, version 9.0 dated 31/7/24.</p> <p>Published version in Sharepoint is 11.0.</p>

Appendix A - DPE Management Plan Approval Correspondence

Department of Planning, Housing & Infrastructure



Our ref: MP08_0184-PA-112

Bradley Tanswell
Environment and Community Coordinator
Ulan Coal Mines Pty Limited

02/08/2024

Subject: Ulan Coal Mine – Air Quality and Greenhouse Gas Management Plan

Dear Mr. Tanswell,

I refer to the Air Quality and Greenhouse Gas Management Plan submitted in accordance with Condition 22 of Schedule 3 of the consent for Ulan Coal Continued Operations Project (MP08_0184 as modified). I also acknowledge your response to the Department's review comments and request for additional information.

I note the Air Quality and Greenhouse Gas Management Plan has been prepared in consultation with the EPA and Council and contains the information required by the conditions of consent.

The Department has carefully reviewed the document and is satisfied that it meets the requirements of the relevant conditions in the consent (MP08_0184 as modified).

Accordingly, as nominee of the Planning Secretary, I approve the Air Quality and Greenhouse Gas Management Plan (Revision 9.0 dated 31 July 2024).

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Katie Weekes on (02) 49273223 or via email at katie.weekes@dpie.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read "SOD", positioned above the printed name of the Director.

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Planning Secretary

Appendix B - UCMPL Dust and Weather TARP

	Normal State	Level 1/Attention Triggers	Level 2/Alert Triggers	Level 3/Alarm Triggers
Trigger Action Response Plan Weather Alarms Dust Alarms or Visual Trigger	<p>Normal weather conditions expected for operating throughout the day with low potential of dust related impacts.</p> <p>No cause for review or action, but routine dust management to be continued.</p> <p>Visual Triggers attached.</p> <p>Also monitor dust production from TSFs and areas surrounding product stockpiles.</p>	<p>SX74_LV1 D1 24 Hrs Elevated 1 Up Trig: D1PM10MC24>=30.0 (meaning PM₁₀ levels are >30 µg/m³ and <39.9 µg/m³) or Weather1 REP I Trig: WSPD>8.0 or temp>32c</p> <p>Weather conditions changed from normal, indicating an adverse weather event and a potential dust risk of dust related impacts occurring.</p> <p>Adverse weather event triggered requires monitoring to detect evidence of elevated dust from operations.</p>	<p>SX74_LV2 D1 24 Hrs Near Crit 1 UP Trig: D1PM10MC24>=40.0 (meaning PM₁₀ levels are >40 µg/m³ and <49.9 µg/m³) or Weather2 REP I Trig: WSPD>10 or temp>36c</p> <p>Weather conditions changed indicating a serious adverse weather event with a moderate risk of dust related impacts occurring.</p> <p>Adverse weather event triggered requires remedial action to be planned and executed to reduce the potential of elevated dust.</p> <p>Orange visual dust trigger.</p>	<p>SX74_LV3_D1 24Hr Exceedance 1UP Trig: DPM10MC24>=50.0 (meaning PM₁₀ levels are >50 µg/m³) or Weather3 REP I Trig: WSPD>12 or temp >40.</p> <p>Weather conditions changed indicating an extremely serious adverse weather event with high risk of dust related impacts occurring.</p> <p>Adverse weather event triggered. A situation has occurred that poses an immediate dust risk. Stop activities generating dust in consultation with Mine Manager.</p> <p>Red visual dust trigger.</p>
Persons Affected	Action / Response	Action / Response	Action / Response	Action / Response
Shift Supervisor	<p>Undertake work and tasks as normal.</p> <p>Maintain dust suppression and dust management activities.</p> <p>Periodically monitor dust activity via camera surveillance and/or pit inspections.</p>	<p>Note Level 1 status in Shiftly Report and monitor operations for signs of elevated dust.</p> <p>Advise all operators of Level 1 dust and weather alert to ensure close attention to visual monitoring of work area.</p> <p>Review planned operations and make provision for modification of activities if elevated dust is noted from operations.</p> <p>Monitor dust activity via camera surveillance and/or pit inspections.</p> <p>Record the actual actions taken in Shiftly Report.</p>	<p>Note Level 2 status in OCE Shift Report and monitor operations for signs of elevated dust.</p> <p>Advise all operators of Level 2 dust and weather alert to ensure close attention to visual monitoring of work area.</p> <p>Review planned operations and make provision for modification of activities at exposed/elevated areas if dust is noted from operations.</p> <p>Review operation with respect to visual triggers in Table 7-4 and apply additional dust suppression and/or alteration of operation as necessary.</p> <p>Record the actual actions taken to minimise Ulan's impact of elevated dust, and include equipment operating, and equipment shut down (if any) in the Shiftly Report.</p>	<p>Note Level 3 status in Shiftly OCE Shift Report and contact Mine Manager.</p> <p>Advise all operators of the Level 3 dust and weather alert to ensure close attention to visual monitoring of work area.</p> <p>Review operations with respect to visual triggers in Table 7-4 and apply additional dust suppression and/or alteration of operation as necessary.</p> <p>Stop activities generating elevated dust in consultation with the Mine Manager until conditions return to a lower TARP level.</p> <p>Record the actual actions taken to minimise Ulan's impact of elevated dust, and include equipment operating, and equipment shut down (if any) in the Shiftly Report.</p>
<p>NOTE: If dust risk cannot be adequately controlled at Levels 1 - 2 then activities generating elevated dust in the work area shall STOP in consultation with the Mine Manager until conditions improve or can be mitigated.</p>				

Table 7-4 Visual Dust Triggers and Associated Actions

Work Area/Equipment	Normal State		Level 2 Triggers		Level 3 Triggers	
	Trigger	Action/Response	Trigger	Action/Response	Trigger	Action/Response
Haul trucks / haul roads	<p>Dust below wheel height</p> 	<p>Continue work/ tasks as normal. Maintain dust suppression activities. Continue to monitor operation</p>	<p>Dust above wheel height, but below tray height.</p> 	<p>Truck Operator to reduce speed & notify water cart operators for additional dust suppression. Limit grading activities. Consolidate haul roads and dumps in use. Reduce haul distance if possible. Shut non-essential roads.</p>	<p>Dust above tray height</p> 	<p>Truck operators to notify Mining Supervisor and STOP work. Mining Supervisor to call for additional dust suppression. Work to resume once water cart operator has advised roadway is adequately watered.</p>
Dozers / Dumps		<p>Continue work/ tasks as normal. Continue to monitor operation</p>		<p>Dozer operator / Supervisor to limit activity to leeward side of area. Reduced drop height of material. Cease non-essential activities and operations in wind exposed areas. Limit travel speeds. Water work areas</p>		<p>Limit dumping to block tipping only. Dozer operators to notify Mining Supervisor and STOP where block tip unavailable. Work to resume only when controls are sufficient or weather conditions permit.</p>
Drills	<p>No dust visible below deck height</p> 	<p>Continue work/ tasks as normal. Maintain dust suppression activities. Continue to monitor operation</p>	<p>Dust visible at deck height. Sporadic event.</p> 	<p>Drill operators to ensure dust suppression system functioning correctly. Mining Supervisor monitor conditions. Assess impact of weather conditions and modify operations as required.</p>	<p>Persistent emissions of dust above deck height.</p> 	<p>Drill operator STOP operations. Dust suppression system to be checked for operational issues and maintenance requirements. Only recommence work if the dust suppression system is operable, site preparation is adequate and weather conditions permit.</p>

Work Area/Equipment	Normal State		Level 2 Triggers		Level 3 Triggers	
	Trigger	Action/Response	Trigger	Action/Response	Trigger	Action/Response
Excavator loading		Continue work/ tasks as normal. Maintain dust suppression activities. Continue to monitor operation		Excavator operator to ensure dust suppression system functioning correctly. Supervisor monitor conditions. Assess impact of weather conditions and modify operations as required.		Excavator operators to notify Supervisor and STOP work. Supervisor to call for additional dust suppression. Only recommence work if the dust suppression system is operable and weather conditions permit.
ROM Pad		Automated foggers are in operation. Continue work/ tasks as normal. Continue to monitor operation		CHPP to ensure suppression system functioning correctly. Limit tramping or pushing distances. Limit number of operations being conducted. Increase watering of area. Change coal type		Dust suppression system to be checked for operational issues and maintenance requirements. Only recommence work if the dust suppression system is operable, site preparation is adequate and weather conditions permit. Change coal type
In-pit Crusher		Continue work/ tasks as normal. Continue to monitor operation		Increase water suppression. Change material type.		Crushing operations STOP . Dust suppression system to be checked for operational issues and maintenance requirements. Only recommence work if the dust suppression system is operable and weather conditions permit.
Dragline		Continue work/ tasks as normal. Continue to monitor operation		Dragline Operator To modify operations to reduce dust by: - loading less in the bucket; - reducing the height of the bucket above the ground prior to emptying; and - avoiding dragline rotation during bucket emptying. Report conditions to Shift Supervisor.		Dust generated from the dragline that is travelling away from the dragline for a sustained period (e.g. 15 mins) Modify Operations to reduce dust. Supervisors to call Open Cut Examiner to assess dragline operation and dust levels. Consider ceasing dragline operations; only recommence work if weather conditions permit.
Water carts	Normal operation	Water carts to be manned as required. Services to be planned for night shifts.	Water carts	Normal operation	Water carts to be manned as required. Services to be planned for night shifts.	