

Muswellbrook Coal Company Limited



Established 1907

AIR QUALITY MANAGEMENT PLAN (AQMP)

APPROVED BY MSC

DATE: OCTOBER 2020

Version	Date	Section Modified	Reason for Modification	Review Team
1	March 2005	All	Original Management Plan	MCC Technical Services Department Carbon Based Environmental
2	December 2010	All	5 Yearly Review	MCC Technical Services Department Carbon Based Environmental
3	December 2015	All	5 Yearly Review	MCC Environmental, Technical Services and Production Departments
4	June 2017	All	Update following modification for Continuation Project	MCC Environmental, Technical Services and Production Departments
5	October 2020	Section 4.0	Three yearly review	MCC Environmental Department

Approved by General Manager: Signature on file

Date: December 2020

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1.0 INTRODUCTION

Muswellbrook Coal Company Limited (MCC) operates the Muswellbrook Open Cut Coal Mine, located approximately 3 kilometres (km) to the north east of Muswellbrook in the Hunter Valley of New South Wales (Plan 1A). MCC is a wholly owned subsidiary of Idemitsu Australia Resources Pty Limited (IAR). IAR has been operating in Australia since 1978 and is an Australian subsidiary of Japanese company Idemitsu Kosan Company Limited.

On September 1, 2003, Development Consent for DA 205/2002 was granted by Muswellbrook Shire Council (MSC) to extend the former MCC No.1 Open Cut. The No.1 Open Cut Extension commenced operations in March 2005 and has a capacity to produce up to 2,000,000 tonnes coal per annum. This approval has subsequently been modified on several occasions with the latest modification granted in 2016 to allow mining in an area known as the “Continuation Project” and to extend the life of the mining operations to 2022. Rehabilitation activities will continue past this date.

1.1 SCOPE

The Development Consent requires the preparation, approval and implementation of an Environmental Management Strategy (EMS) and subordinate Environmental Management Plans (EMP). One of these EMPs is the Air Quality Management Plan (AQMP). This AQMP also addresses environmental protection licence conditions that relate to MCC’s air quality management system. Whilst this plan specifically addresses issues related to the management of air quality generating activities, it should be read in conjunction with other EMPs.

This AQMP has been prepared in consultation with Environmental Protection Authority (EPA) to the satisfaction of MSC (see **Appendix 1** for copies of correspondence).

1.2 OBJECTIVES

The objective of the AQMP is to manage and minimise the impact of air quality from mining operations on the environment and nearby residences. The following actions will be undertaken to achieve this objective:

- Detail the methods to be used to minimise air quality emissions;
- Maintain an air quality monitoring program;
- Identify the risk levels at which mine operations may need to be modified to manage compliance;
- Define the measures to manage short term episodic events;
- Define the mechanisms for community consultation;
- Detail the management measures to be undertaken where the air quality levels are demonstrated to exceed the criterion;
- Detail the specifications and procedures to be used for the purpose of Independent Air quality Investigations; and
- Specify the regulatory reporting requirements.

2.0 STATUTORY REQUIREMENTS

The relevant approval and licence conditions are shown in **Table 1** along with information on where they are addressed in this plan.

Table 1: Statutory Requirements

Approval/ Licence Condition No.	Condition	Section								
Development Consent										
27	<p>The Applicant must ensure that all reasonable and feasible avoidance and mitigations measures are employed so that particulate matter emissions generated by the development do not cause exceedance of the relevant air quality criteria at a residence on privately owned land.</p> <p>The relevant air quality criteria for the development are contained in Table 1 and Table 2, below.</p> <p>Table 1. Long Term Particulate Matter Criteria</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10µg (PM₁₀)</td> <td>30µg/m³ (annual mean)</td> </tr> </tbody> </table> <p>Table 2. Short Term Particulate Matter Criteria</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate Matter <10µm (PM₁₀)</td> <td>50µg/m³ (24hr average)</td> </tr> </tbody> </table> <p>Note:</p> <ul style="list-style-type: none"> • Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources); • Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, (but not Spontaneous Combustion within the mine) or any other activity agreed by Council 	Pollutant	Criterion	Particulate matter < 10µg (PM ₁₀)	30µg/m ³ (annual mean)	Pollutant	Criterion	Particulate Matter <10µm (PM ₁₀)	50µg/m ³ (24hr average)	3.0
Pollutant	Criterion									
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Pollutant	Criterion									
Particulate Matter <10µm (PM ₁₀)	50µg/m ³ (24hr average)									

Approval/ Licence Condition No.	Condition	Section									
28	<p>The Applicant must use reasonable and feasible measures to manage the development so that the atmospheric gas emissions generated by the development do not cause exceedance of the relevant air quality criteria at any residence on privately owned land.</p> <p>The relevant atmospheric air quality criteria for the development are contained in Table 3 below.</p> <p>Table 3. Atmospheric Gas Content Criteria</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th colspan="2">Criterion</th> </tr> </thead> <tbody> <tr> <td>Sulphur dioxide (SO₂)</td> <td>80 ppb (24hr average)</td> <td>200 ppb (1hr average)</td> </tr> <tr> <td>Hydrogen Sulphide (H₂S)</td> <td>100 ppb (24hr average)</td> <td>500 ppb (1hr average)</td> </tr> </tbody> </table> <p>Note:</p> <ul style="list-style-type: none"> • Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources); • Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, (but not Spontaneous Combustion within the mine) or any other activity agreed by Council • The need for the applicant to monitor its compliance with the requirements in Table 3, pursuant to the Air Quality Management Plan and condition 30A of this development consent be waived in the future depending on Council's consideration of the outcomes of the EPA's current Environmental Study and any changes would be by agreement with Council. 	Pollutant	Criterion		Sulphur dioxide (SO ₂)	80 ppb (24hr average)	200 ppb (1hr average)	Hydrogen Sulphide (H ₂ S)	100 ppb (24hr average)	500 ppb (1hr average)	3.0
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29	<p>The Applicant must prepare a detailed Air Quality Management Plan for the development in consultation with the EPA, to the satisfaction of Council, and carry out the development in accordance with this plan.</p> <p>This plan must include, but not be limited to the following matters:</p>	This plan									
29 (i)	the identification of properties which may be affected by dust generated by the mine in excess of the criteria detailed above;	3.4									
29 (ii)	specifications of the procedures for the dust monitoring program and atmospheric gas assessment for the management of the mine and for the purpose of undertaking independent investigations;	4.0									
29 (iii)	outline the procedure to notify property owners and occupiers as identified by monitoring as likely to be affected by dust generated by the mine in excess of the criteria detailed above;	7.0									
29 (iv)	mitigation measures to be employed to minimise dust and/or atmospheric gas emissions during the operation phase (this plan can refer to the Spontaneous Combustion Management Plan for atmospheric gas). This should include proactive/predictive and reactive mitigation measures to be employed to minimise dust and/or atmospheric gas emissions including visible dust emanating from the site;	3.0									

Approval/ Licence Condition No.	Condition	Section
29 (v)	the Applicant must ensure the prompt and effective rehabilitation of all disturbed areas of the application area following the completion of mining and associated activities in that area to minimise the generation of wind-blown dust;	3.1
29 (vi)	the use of the existing protocol for handling dust and atmospheric gas complaints that include recording, reporting and acting on complaints;	5.0
29 (vii)	details of locations and frequency of existing monitoring;	4.0
29 (viii)	as far as practicable details of the interrelationships of this plan with the Air Quality Management Plans with other mining operations in the vicinity; and	6.2
29 (ix)	unsealed roads are to be managed to minimise the generation of fugitive dust.	3.1
30 (a)	<p>The Applicant must:</p> <ul style="list-style-type: none"> (i) operate in real time air quality monitors representative of residence on privately owned land to the north and south of the development. The locations of all the monitors must be identified in the Air Quality Management Plan as approved by Council. (ii) monitor and report against criteria in Tables 1 and 2 for the monitors located to be representative of nearby residences on privately owned land in accordance with the Air Quality Management Plan. The results of this monitoring and reporting are to be incorporated into the AEMR; (iii) Include in the AEMR a summary of the performance of the control measures and of the monitoring system against the criteria outlined in Tables 1 and 2. The assessment locations and the methodology of assessment is to be identified in the Air Quality Management Plan, and 	<p>4.0</p> <p>9.2</p> <p>9.2</p>

Approval/ Licence Condition No.	Condition	Section
30 (b)	<p>In the event that a landowner or occupier of a residence on privately owned land considers that dust from the development at his/her dwelling is in excess of the criteria detailed in Tables 1 or 2 of the consent, and Council is satisfied after adequate examination of the relevant facts, that an investigation is required, the Applicant must upon the receipt of a written request from Council:</p> <ul style="list-style-type: none"> (i) consult with the landowner or occupant affected to determine his/her concerns; (ii) commission an independent dust impact assessment at the privately owned residence, and provide a report to Council. Where elevated levels of dust in excess of the criteria in Tables 1 and 2 are identified, and the independent expert is of the opinion that the Applicant's activities have materially contributed to the exceedance, the independent dust assessment is to include suggested remedial actions; (iii) modify the mining activity or take other steps in accordance with the Air Quality Management Plan, or independent dust assessment, if exceedances are demonstrated by the independent investigations, engaged by the Applicant, to materially result in part from the development related activity. This may include: <ul style="list-style-type: none"> 1) introduction of additional controls, either of dust generation from individual sources on the site or on site operations, or modify operations to attempt to ensure that the dust criteria are achieved; and/or; 2) negotiate, as far as reasonably practicable, an agreement with the landowner or provide such forms of benefit or amelioration of the impact of dust as may be agreed between the parties as providing acceptable compensation for the dust levels experienced. (iv) conduct follow up investigation(s) to the satisfaction of the Council, where necessary. <p>Note: Appendix E of the determination outlines the process for mitigation measures</p>	8.1
30 (c)	<p>If the independent dust investigations in sub-clause (b) above confirm that dust levels from the Project alone are in excess of the relevant criteria detailed in Tables 1 and 2 of the consent, and if the measures in sub-clause (b)(iii) (1) above do not reduce the dust levels, from the Project alone, below the criteria detailed in the consent, or if agreement in accordance with sub-clause (b)(iii) (2) above cannot be reached, the Applicant must at the written request of the owner acquire the relevant property. Acquisition shall be generally in accordance with the procedures set out in Condition 49 of this consent.</p>	8.1

Approval/ Licence Condition No.	Condition	Section
30 (d)	Further independent investigation(s) shall cease if Council is satisfied that the relevant criteria detailed in the consent are not being exceeded and are unlikely to be exceeded in the future.	8.1
30A (a)	<p>The Applicant must:</p> <ul style="list-style-type: none"> (i) Operate gas assessment equipment representative of non-mine owned residents to the north and south of the development. The locations of the atmospheric gas assessment equipment must be identified in the Air Quality Management Plan. (ii) Include in the AEMR a summary of the performance of the control measures and of the monitoring system, Assess the Atmospheric Gas Content against the requirements outlined in Table 3. The assessment locations and the methodology of assessment is to be identified in the Air Quality Management Plan, and; (iii) Should the results of the Atmospheric Gas Content criterion outlined in Table 3 be exceeded, the Applicant is to immediately advise Council. 	<p>4.2</p> <p>9.2</p> <p>9.1</p>
30A (b)	<p>In the event that a landowner or occupier of a residence on privately owned land considers that atmospheric gas from the development at his/her dwelling is in excess of the criteria detailed in Table 3 of the consent, and Council is satisfied that an investigation is warranted, the Applicant must upon the receipt of a written request from Council:</p> <ul style="list-style-type: none"> (i) consult with the landowner or occupant affected to determine his/her concerns; (ii) commission a relevant expert, approved by Council, to conduct an independent atmospheric gas impact assessment at the residence, and provide a report to Council. Where levels of atmospheric gas in excess of the criteria in Table 3 are identified, and the independent expert is of the opinion that the Applicant's activities have caused the exceedances, the Applicant must: <ul style="list-style-type: none"> a. modify the mining activity or take such other steps as are reasonably necessary to ensure that the Applicant operates so as not to cause or partly cause the criteria identified in Table 3 to be exceeded at the residence. b. conduct follow up investigation(s) to the satisfaction of the Council, where necessary. 	8.2

Approval/ Licence Condition No.	Condition	Section																																
Environmental Protection Licence																																		
P1.1	<p>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.</p> <table border="1"> <thead> <tr> <th>EPA identification no.</th> <th>Type of Monitoring Point</th> <th>Type of Discharge Point</th> <th>Location Description</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>Particulate Matter Monitor</td> <td></td> <td>TEOM located at co-ordinates 305255 6432519 (Easting Northing).</td> </tr> <tr> <td>8</td> <td>Particulate Matter Monitor</td> <td></td> <td>TEOM located at coordinates 306051 6429269 (Easting Northing).</td> </tr> <tr> <td>9</td> <td>Ambient Air Monitoring</td> <td></td> <td>Hydrogen Sulfide (H2S) monitor located at co-ordinates 305255 6432519 (Easting Northing) defined as Ambient Air Monitoring Location 9 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17</td> </tr> <tr> <td>10</td> <td>Ambient Air Monitoring</td> <td></td> <td>Hydrogen Sulfide (H2S) monitor located at co-ordinates 305934 6426585 (Easting Northing) defined as defined as Ambient Air Monitoring Location 10 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17.</td> </tr> <tr> <td>13</td> <td>Ambient Air Monitoring</td> <td></td> <td>TEOM located at co-ordinates 305934 6426585 (Easting Northing)</td> </tr> <tr> <td>15</td> <td>Ambient Air Monitoring</td> <td></td> <td>Sulfur Dioxide (SO2) monitor located at co-ordinates 305255 6432519 (Easting Northing) defined as Ambient Air Monitoring Location 15 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17</td> </tr> <tr> <td>16</td> <td>Ambient Air Monitoring</td> <td></td> <td>Sulfur Dioxide (SO2) monitor located at co-ordinates 305934 6426585 (Easting Northing) defined as Ambient Air Monitoring Location 9 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17</td> </tr> </tbody> </table>	EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	7	Particulate Matter Monitor		TEOM located at co-ordinates 305255 6432519 (Easting Northing).	8	Particulate Matter Monitor		TEOM located at coordinates 306051 6429269 (Easting Northing).	9	Ambient Air Monitoring		Hydrogen Sulfide (H2S) monitor located at co-ordinates 305255 6432519 (Easting Northing) defined as Ambient Air Monitoring Location 9 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17	10	Ambient Air Monitoring		Hydrogen Sulfide (H2S) monitor located at co-ordinates 305934 6426585 (Easting Northing) defined as defined as Ambient Air Monitoring Location 10 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17.	13	Ambient Air Monitoring		TEOM located at co-ordinates 305934 6426585 (Easting Northing)	15	Ambient Air Monitoring		Sulfur Dioxide (SO2) monitor located at co-ordinates 305255 6432519 (Easting Northing) defined as Ambient Air Monitoring Location 15 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17	16	Ambient Air Monitoring		Sulfur Dioxide (SO2) monitor located at co-ordinates 305934 6426585 (Easting Northing) defined as Ambient Air Monitoring Location 9 on the Muswellbrook Coal Company Limited Muswellbrook Coal Mining Operations Premise Plan dated 9-08-17	4.0
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Approval/ Licence Condition No.	Condition	Section
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	3.1
O3.2	Activities occurring in or on the premises must be carried out in a manner that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust.	3.1
O3.3	All trafficable areas, coal storage areas and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the generation, or emission from the premises, of wind-blown or traffic generated dust.	3.1
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	4.3
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	4.3
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	4.3
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling methods, units of measure, and sample at the frequency, specified opposite in the other columns:	4.0

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M2.2	<p>POINT 7,8,13</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>PM10</td> <td>micrograms per cubic metre</td> <td>Continuous</td> <td>AM-22</td> </tr> </tbody> </table> <p>POINT 9,10</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Hydrogen Sulfide</td> <td>parts per hundred million</td> <td>Continuous</td> <td>Special Method 1</td> </tr> </tbody> </table> <p>POINT 15,16</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Sulphur dioxide</td> <td>parts per hundred million</td> <td>Continuous</td> <td>Special Method 1</td> </tr> </tbody> </table> <p><i>Special Method 1 requires the Licensee to undertake the monitoring of Hydrogen sulphide and Sulphur dioxide in accordance with method as approved by the Environment Protection Authority using Serinus 51 analyser.</i></p>	Pollutant	Units of measure	Frequency	Sampling Method	PM10	micrograms per cubic metre	Continuous	AM-22	Pollutant	Units of measure	Frequency	Sampling Method	Hydrogen Sulfide	parts per hundred million	Continuous	Special Method 1	Pollutant	Units of measure	Frequency	Sampling Method	Sulphur dioxide	parts per hundred million	Continuous	Special Method 1	4.0
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M3.1	<p>Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:</p> <p>(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or</p> <p>(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or</p> <p>(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place</p> <p><i>Note: The Protection of the Environment Operations (Clean Air) Regulation 2010 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".</i></p>	4.0																								
M8.2	<p>The licensee must record the average PM10 concentration at Monitoring Points 7 and 8 at intervals of 10 minutes. This data must be made available upon request by any Authorised Officer of the EPA who asks to see them.</p>	4.0																								

Approval/ Licence Condition No.	Condition	Section
M8.3	<p>The licensee must record:</p> <ul style="list-style-type: none"> a) average PM10 concentration at monitoring point 13 at intervals of one hour; b) average sulphur dioxide concentration at monitoring points 15 and 16 at intervals of one hour; c) average hydrogen sulphide concentrations at monitoring points 9 and 10 at intervals of 30 minutes; and d) this data must be made available upon request by an Authorised Officer of the EPA who asks to see them. 	4.0
R1.1	<p>The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:</p> <ul style="list-style-type: none"> 1. a Statement of Compliance, 2. a Monitoring and Complaints Summary, 3. a Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. 	9.3

2.1 AIR QUALITY CRITERIA

Air quality criteria are set in Development Consent DA205/2002 and are reproduced in **Table 2 to Table 4**.

Table 2: Long Term Particulate Matter Criteria

Pollutant	Standard / Goal
Particulate Matter <10µg (PM ₁₀)	30µg/m ³ (annual mean)

Note: This is shown as Table 1 in DA205/2002.

Table 3: Short Term Particulate Matter Goal

Pollutant	Standard/Goal
Particulate Matter <10µm (PM ₁₀)	50µg/m ³ (24-hour average)

Note: This is shown as Table 2 in DA205/2002.

Table 4: Atmospheric Gas Content Criteria

Pollutant	Criterion	
Sulphur Dioxide (SO ₂)	80ppb (24 hour average)	200ppb (1 hour average)
Hydrogen Sulphide (H ₂ S)	100ppb (24 hour average)	500ppb (1 hour average)

Note: This is shown as Table 3 in DA205/2002.

3.0 AIR QUALITY MITIGATION AND CONTROL PROCEDURES

3.1 DUST CONTROL PROCEDURES

Dust can be generated from two primary sources, either windblown dust from exposed areas or dust generated by mining activities. The control procedures utilised by MCC for these sources include the procedures outlined in **Table 5** and **Table 6**.

Table 5: Control Procedures for Wind Blown Dust

Source	Control Procedures
Areas disturbed by mining	<ul style="list-style-type: none"> Disturb only the minimum area necessary for mining. Reshape, topsoil and rehabilitate completed overburden emplacement areas after the completion of overburden tipping.
Coal Handling and Coal Stockpile Areas	<ul style="list-style-type: none"> Maintain coal handling areas in a moist condition using water carts to minimise windblown and traffic generated dust. Clean-up after any spillage event. Water carts to operate around the coal stockpile area to suppress dust from roadways and the coal stockpiles.

Table 6: Control Procedures for Mining Generated Dust Sources

Source	Control Procedures
Haul roads	<ul style="list-style-type: none"> All roads and traffic areas will be watered using water carts to minimise the generation of dust. Long term haul roads will be sheeted with hard wearing material where practicable.
Minor roads	<ul style="list-style-type: none"> Development of minor roads will be limited to those roads as required by mining and rehabilitation activities. Minor roads will be watered if used for extended periods.
Topsoil stockpiling	<ul style="list-style-type: none"> All topsoil stockpiles will be located and shaped to minimise the area exposed to prevailing winds. Long term topsoil stockpiles, not used for over 6 months will be vegetated.
Drilling	<ul style="list-style-type: none"> Dust aprons will be lowered during drilling. Drills will be equipped with dust extraction cyclones or water injection systems. Water injection or suppression sprays will be used when high levels of dust are being generated.
Blasting	<ul style="list-style-type: none"> Stemming will be used at all times. Blasting will occur in accordance with the Blast-Vibration Management Plan relating to meteorological conditions.
Raw Coal Receival Bin	<ul style="list-style-type: none"> Sprays are to be used when tipping raw coal into the receival bin during high wind events.
Coal Handling and Preparation Plant	<ul style="list-style-type: none"> Sprays are fitted at transfer points.

Equipment to be available and used to control dust generation include: water cart (sprays on haul roads and coal stockpiles), sprays at the Raw Coal Receival Bin, sprays at conveyor transfer points, dust extraction cyclones or water injection systems on drill rigs.

3.2 SHORT TERM DUST EPISODIC EVENTS

Periods of high dust emissions usually relate to periods of high wind speeds. The primary wind directions are generally from the south east in summer and from the northwest during the winter.

Short term episodic events generally result from:

- Wind gusts related to changes in the wind direction;
- Periods of high wind speeds; and
- Blasting operations.

The procedures to manage short term episodic events that may affect Muswellbrook are shown in **Table 7**.

Table 7: Control Measures for Short Term Episodic Events

Scenario	Control Procedures
Wind speeds greater than 5m/s from the mining operation towards Muswellbrook or a real-time air quality alarm is triggered.	<ul style="list-style-type: none"> • Initial warning provided to OCE. • OCE to confirm that all available water trucks and fixed spray systems are operational. • Blasting may be deferred, if safe to do so. • OCE to inspect operations to identify any operations that are generating dust emissions and identify further mitigation measures.
Wind speeds greater than 10m/s.	<ul style="list-style-type: none"> • All topsoil stripping and/or placement activities are to be reviewed for ongoing operation. • All operations on out-of-pit overburden dumps are to be reviewed for ongoing operation. • Blasting will be deferred, if safe to do so. • Maximum availability of dust suppression equipment to be used. • OCE to inspect operations to identify any activities that are causing excessive dust emissions and stop these identified activities.

3.3 ADVERSE WEATHER

MCC utilise a forecasting system to predict the likelihood of potential adverse weather conditions with the forecasts being considered in the mine planning process. When adverse weather conditions are anticipated operations are modified or additional measures are implemented, where practicable, to reduce excess emissions leaving site. These measures may include but are not limited to:

- Dumping in protected areas;
- Running water carts for longer hours;
- Wetting down areas prior to any predicted change arriving;
- Ceasing rehabilitation activities;
- Ceasing grading of non-essential roads;
- Postponing blasting, where safe to do so;
- Trucks driving slower to reduce dust generation;
- Water cart spraying water over the blast loading area to help crust the surface; and
- Water cart spraying water onto material before loading.

It is noted that these additional control measures can introduce additional safety risks and reduce production output, so they are not utilised as standard dust control procedures on non-adverse weather days.

3.4 IDENTIFICATION OF PROPERTIES AFFECTED BY DUST

An Air Quality and Greenhouse Gas Assessment (AQGGA) was prepared as part of the Statement of Environmental Effects (SEE) for the Continuation Project. The AQGGA concluded that there are no predicted exceedances of the long term PM10 criteria at any privately-owned property. The AQGGA concluded that two privately owned

properties would be expected to experience concentrations above the short term PM₁₀ criteria for a maximum of three days/year as a result of MCC's operations. These properties are identified as R25 and R40 in **Figure 1**. Due to this predicted exceedance of the short-term criteria, these properties have been provided with a copy of the NSW Health Fact Sheet entitled "Mine Dust and You" and have been advised that they are entitled to mitigation measures upon request. Any mitigation measures will be negotiated directly with the affected property owners and will be consistent with the requirements of the DPE's Voluntary Land Acquisition and Mitigation Policy.

A mitigation agreement has been finalised with the owners of property R40.

3.5 ATMOSPHERIC GAS CONTROL PROCEDURES

Control measures for atmospheric gas are discussed in the Spontaneous Combustion Management Plan (SCMP).

4.0 AIR QUALITY MONITORING PROGRAM

The Air Quality Monitoring Program incorporates two major components. These are:

- Monitoring of fine air quality particles less than 10µg (PM₁₀); and
- Monitoring of atmospheric gas content (SO₂ and H₂S).

This program has been developed in consultation with MSC and the EPA. The locations of the monitoring sites can be seen in **Figure 1**. All monitoring equipment will be maintained and calibrated as required.

When mining operations cease the requirement for ongoing air quality monitoring will be reviewed in consultation with the EPA and MSC before the changes are implemented.

4.1 PARTICULATE MATTER (PM₁₀)

Particles less than 10µg mean aerodynamic diameter (PM₁₀) will be measured on a continuous basis using a Tapered Element Oscillating Microbalance (TEOM) at three locations. The TEOM units continuously relay PM₁₀ data to a website that site personnel have access to. The locations of these units are shown in **Figure 1** with a description provided in **Table 8**. All PM₁₀ monitoring will be in intervals of 10 minutes.

PM₁₀ monitoring and maintenance of the units will be conducted in accordance with the EPA Approved Sampling Method AM-22.

Table 8: PM₁₀ Monitoring Locations

Location Identifier	Equipment Type	Description of Location	Reason for Monitoring
Site 7	TEOM	Sandy Creek Road – northwest of operations	Compliance with development consent – impacts on residents to northwest of operations Compliance with environmental protection licence – dust optimisation monitoring requirements
Site 8	TEOM	On site near the weighbridge – southeast of operations	Compliance with environmental protection licence – dust optimisation monitoring requirements
Site 9	TEOM	Between Muscle Creek and Muscle Creek Road – southeast of operations	Compliance with development consent – impacts on residents to southeast of operations

If additional monitoring is required for independent dust investigations (see **Section 8.1**), this will be identified in the scope of the investigation by the independent consultant.

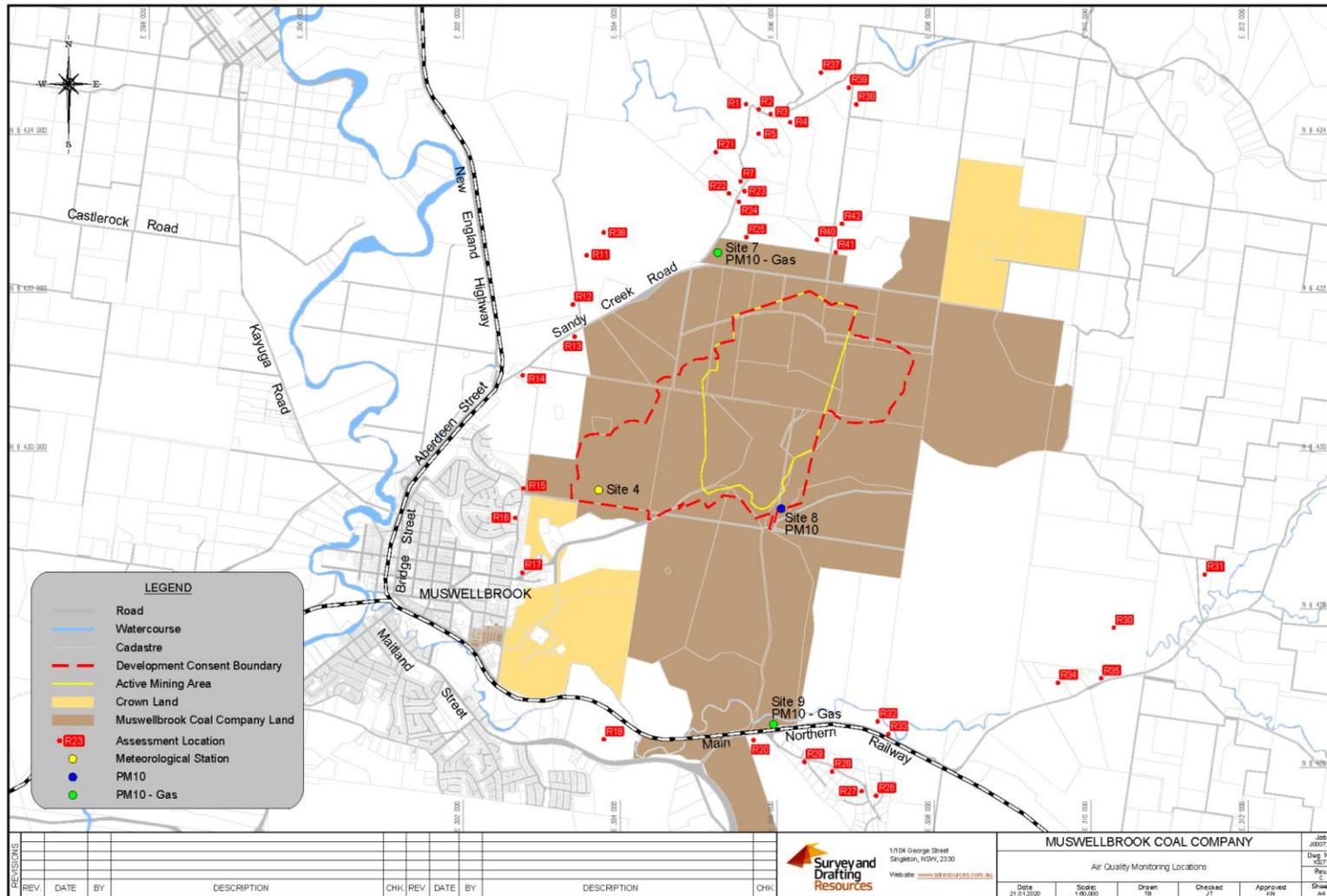


Figure 1: Air Quality Monitoring Locations

4.2 ATMOSPHERIC GAS MONITORING

Sulphur Dioxide (SO₂) and Hydrogen Sulphide (H₂S) will be measured on a continuous basis using a Serinus 51 automatic gas detector at two locations. The Serinus 51 gas detector will continuously relay gas data to a website that site personnel have access to. The locations of these units are shown in **Figure 1** with a description provided in **Table 9**.

Monitoring and maintenance of the respective SO₂ and H₂S units will be conducted in accordance with the manufacturer's guidelines.

Table 9: Atmospheric Gas Monitoring Locations

Location Identifier	Equipment Type	Description of Location	Reason for Monitoring
Site 7	Serinus 51	Sandy Creek Road – northwest of operations	Compliance with development consent and environmental protection licence – impacts on residents to northwest of operations
Site 9	Serinus 51	Between Muscle Creek and Muscle Creek Road – southeast of operations	Compliance with development consent and environmental protection licence – impacts on residents to southeast of operations

If additional monitoring is required for independent atmospheric gas investigations (see **Section 8.2**), this will be identified in the scope of the investigation by the independent consultant.

The atmospheric gas monitoring requirements will be reviewed and possibly removed with MSC's agreement, following consideration of the outcomes of the EPA's Spontaneous Combustion Emissions Study.

4.3 RECORD KEEPING

All monitoring results will be retained in a legible format for at least four years after they are collected. These results will include date, time and location of monitoring. If a physical sample is collected, the name of the person who collected the sample will also be recorded.

5.0 COMPLAINT MANAGEMENT

Air quality related complaints by the community can be directed to the 24-hour toll-free telephone Environmental Contact Line 1800 600 205. More details on the complaints management at MCC are found in the Environmental Management Strategy.

6.0 EXTERNAL RELATIONS

6.1 EXTERNAL STAKEHOLDERS

External stakeholders are provided information about to air quality management at MCC through a variety of avenues including:

- Air quality monitoring data is made available on MCC's website;
- Air quality monitoring data is provided to the Community Consultative Committee (CCC) and the minutes of the meeting are made available to the public on MCC's website;
- The results of environmental monitoring are published in the AEMR;
- Timely responses are provided to residents in the event of a complaint or inquiry; and
- The CCC receives reports at each committee meeting on the number of air quality-related complaints and the action taken.

6.2 OTHER MINING OPERATIONS

Other operating mines or approved mines nearest to Muswellbrook include Drayton Coal, Mt Arthur Coal, Bengalla Mine, Mount Pleasant Mine and Dartbrook Mine, which are all further southwest/northwest to MCC (these mines are at various stages of development). Therefore, under south easterly wind conditions, these mines will have their lowest impact on Muswellbrook residences when MCC is having its greatest impact. Conversely, nearby mines will have their maximum impact on Muswellbrook residences when winds are from the west to northwest, whilst MCC's operations are having their least impact. As a result of this there have been relatively few, if any, instances where cumulative effects have been experienced as a result of air quality impacts from MCC in conjunction with neighbouring mines. If cumulative effects start to be identified, MCC will work with the other mining operations to manage these cumulative impacts.

7.0 INCIDENT REPORTING

Any results above the criteria shown in **Table 2** and **Table 3** will be investigated to identify the source of the high result. This investigation will determine if an incident has occurred.

In the event that an initial investigation concludes that the criteria shown in **Table 2** and **Table 3** are exceeded due to MCC's operations alone, an air quality related incident has occurred. The incident will be reported to MSC and EPA within 24 hours of confirming the incident.

Within 7 days of notifying MSC and EPA of an incident, MCC will submit a written report that:

- a) Describes the date, time, and nature of the incident;
- b) Identifies the cause (or likely cause) of the incident;
- c) Describes what action has been taken to date to address the incident; and
- d) Describes the proposed measures to address the incident and prevent it from occurring again.

In the event that the criteria shown in **Table 2** and **Table 3** are exceeded at a non-mine residence from MCC's operations alone MCC shall notify the resident of the results in writing and will provide the resident an opportunity to discuss the results further if requested.

8.0 INDEPENDENT AIR QUALITY INVESTIGATION

8.1 PARTICULATE MATTER (PM10)

In the event that a landowner or occupier considers that air quality from MCC at their dwelling is in excess of the criteria detailed in **Table 2** and **Table 3** and MSC is satisfied that an independent investigation is required, MCC shall upon the receipt of a written request from MSC:

- consult with the landowner or occupant affected to determine their concerns;
- commission an independent dust assessment at the residence;
- determine whether any modification to the mining activity needs to be acted on, or take other steps in accordance with the AQMP, if exceedances are demonstrated by the independent investigations to result in part from MCC's activities; and
- conduct follow up investigation(s) to the satisfaction of the MSC, where necessary.

Further independent investigation(s) shall cease if MSC is satisfied that the relevant criteria are not being exceeded and are unlikely to be exceeded in the future.

If the independent air quality investigations confirm that air quality levels from MCC alone are in excess of the relevant criteria and if the measures above do not reduce the air quality levels below the relevant criteria, from MCC alone, or if agreement cannot be reached, MCC shall at the written request of the owner acquire the relevant property. Acquisition shall be in accordance with the procedures set out in DA205/2002.

8.2 ATMOSPHERIC GAS

In the event that a landowner or occupier considers that air quality from MCC at their dwelling is in excess of the criteria detailed in **Table 4** and MSC is satisfied that an independent investigation is required, MCC shall upon the receipt of a written request from MSC:

- consult with the landowner or occupant affected to determine their concerns;
- commission a relevant expert, approved by Council, to conduct an independent atmospheric gas assessment at the residence;
- determine whether any modification to the mining activity needs to be acted on, or take other steps in accordance with the AQMP, if exceedances are demonstrated by the independent investigations to result in part from MCC's activities; and
- conduct follow up investigation(s) to the satisfaction of the MSC, where necessary.

9.0 EXTERNAL REPORTING

Within 2 weeks of approval of this AQMP, a copy will be made available for public viewing via the MCC website.

The performance of MCC's AQMP will be reported through a number of external reporting requirements, which include;

- Notification to MSC of any result above the atmospheric gas criteria;
- Notification to MSC of air quality related complaints received between 1 May and 31 October annually;
- Annual Environmental Management Report (AEMR);
- EPL Annual Licence Return;
- Regular updates of monitoring results on the MCC website; and
- CCC Meetings.

MCC will provide odour and visual observation records to Council, EPA or community members on request.

9.1 NOTIFICATION OF ATMOSPHERIC GAS LEVELS TO MSC

The data from the atmospheric gas monitors will be reviewed and validated regularly. If this data review identifies any gas levels above the criteria in **Table 4** MCC will notify MSC immediately upon confirmation of the results. Weather conditions at the time when the atmospheric gas levels are above the criteria will be included in the notification.

9.2 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

The AEMR will include a summary of:

- Air quality monitoring results and comparison to the criteria, monitoring results from previous years and predictions in any Environmental Assessment (if applicable);
- Summary of air quality related complaints and management measures undertaken;
- Identification of any trends in the monitoring results;
- Measures undertaken during the period to monitor compliance;
- Identification of any non-compliance, and management measures undertaken; and
- Review of the performance of management measures and the monitoring program.

9.3 EPL ANNUAL RETURN

The EPL Annual Return will include a summary of:

- Air quality monitoring results;
- The number of air quality related complaints received; and
- Identification of any air quality related non-compliances, and response to these non-compliances.

10.0 REVIEW OF MANAGEMENT PLAN

The AQMP will be reviewed;

- Within 3 months of changes to Development Consent or licence conditions relating to air quality management;
- Following reportable incidents at MCC relating to air quality management;
- Following an independent environmental audit which recommends changes to the

AQMP;

- If there is a relevant change in technology or legislation;
- At the completion of mining activities; and
- Every three years or as directed by MSC, in accordance with Condition 14(e) of the Development Consent Conditions.

11.0 RESPONSIBILITIES

Table 10 outlines the responsibilities relating to the AQMP.

Table 10: Management Plan Responsibilities

Position	Task	Timing
General Manager	Provide adequate resources to implement the requirements of the AQMP	Annual review
Maintenance Manager	Maintain mining and dust suppression equipment	As per maintenance schedule
OCE	Implement air quality control mitigation measures as outlined in AQMP	As outlined in AQMP
Environmental Superintendent	Notify regulatory authorities of any air quality management related incidents	Following any air quality management related incident
	Coordinate response to all air quality management related complaints	Following air quality management related complaint
	Coordinate reviews of the AQMP	As outlined in AQMP
	Coordinate monitoring as required in AQMP (includes maintenance and calibration of monitoring equipment)	As required (minimum monthly)
	Coordinate reporting as required in AQMP	As required (minimum monthly)

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Appendix 1: Correspondence Regarding Air Quality Management Plan

Air Quality Management Plan approved by MSC via email dated 1 December 2020.