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Dear Ms Annandale

**Mount Pleasant Operation (DA 92/97)  
Air Quality Management Plan**

I refer to your email dated 10 May 2019, submitting a revised Air Quality and Greenhouse Gas Management Plan for approval. The Department notes that the plan has primarily been updated to address the changes approved under modifications 3 and 4.

The Department has reviewed this plan and considers that it satisfies condition 23 of Schedule 3 of DA 92/97. Consequently, the Secretary has approved this plan.

Please ensure a finalised copy of this plan is made available on the company's website.

Should you have any enquiries in relation to this matter, please contact Megan Dawson at the details above.

Yours sincerely

Howard Reed *24.5.19*  
**Director Resource Assessments**  
as nominee of the Secretary



**MOUNT PLEASANT OPERATION**

**AIR QUALITY AND GREENHOUSE GAS  
MANAGEMENT PLAN**

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## 1 INTRODUCTION

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales (NSW), approximately 3 kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton (Figure 1). The village of Aberdeen and locality of Kayuga are also located approximately 5 km north-northeast and 1 km north of the MPO boundary, respectively (Figure 1). The proponent of the MPO is MACH Energy Australia Pty Ltd (MACH Energy), which purchased the MPO from Coal & Allied Operations Pty Ltd (Coal & Allied) in 2016.

The initial development application for the MPO was made in 1997. This was supported by an Environmental Impact Statement (EIS) prepared by Environmental Resources Management (ERM) Mitchell McCotter (ERM Mitchell McCotter, 1997). On 22 December 1999, the then Minister for Urban Affairs and Planning granted Development Consent DA 92/97 to Coal & Allied. This allowed for the “Construction and operation of an open cut coal mine, coal preparation plant, transport and rail load-out facility and associated facilities” at the MPO. The consent allowed for operations 24 hours per day seven days per week and the extraction of 197 million tonnes (Mt) of run-of-mine (ROM) coal over a 21 year period, at a rate of up to 10.5 Mt of ROM coal per year.

The Mount Pleasant Operation Modification (MOD 1) was submitted on 19 May 2010 with a supporting Environmental Assessment (EA) prepared by EMGA Mitchell McLennan (EMGA Mitchell McLennan, 2010). MOD 1 included the provision of an infrastructure envelope for siting the mine infrastructure, the provision of an optional conveyor/service corridor linking the MPO facilities with the Muswellbrook-Ulan Rail Line and modification of the existing Development Consent DA 92/97 boundaries to accommodate the optional conveyor/service corridor and minor administrative changes. MOD 1 was approved on 19 September 2011.

The MPO South Pit Haul Road Modification (MOD 2) was submitted on 30 January 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017a). MOD 2 proposed to realign an internal haul road to enable more efficient access to the South Pit open cut, with no other material changes to the approved MPO. MOD 2 was approved on 29 March 2017.

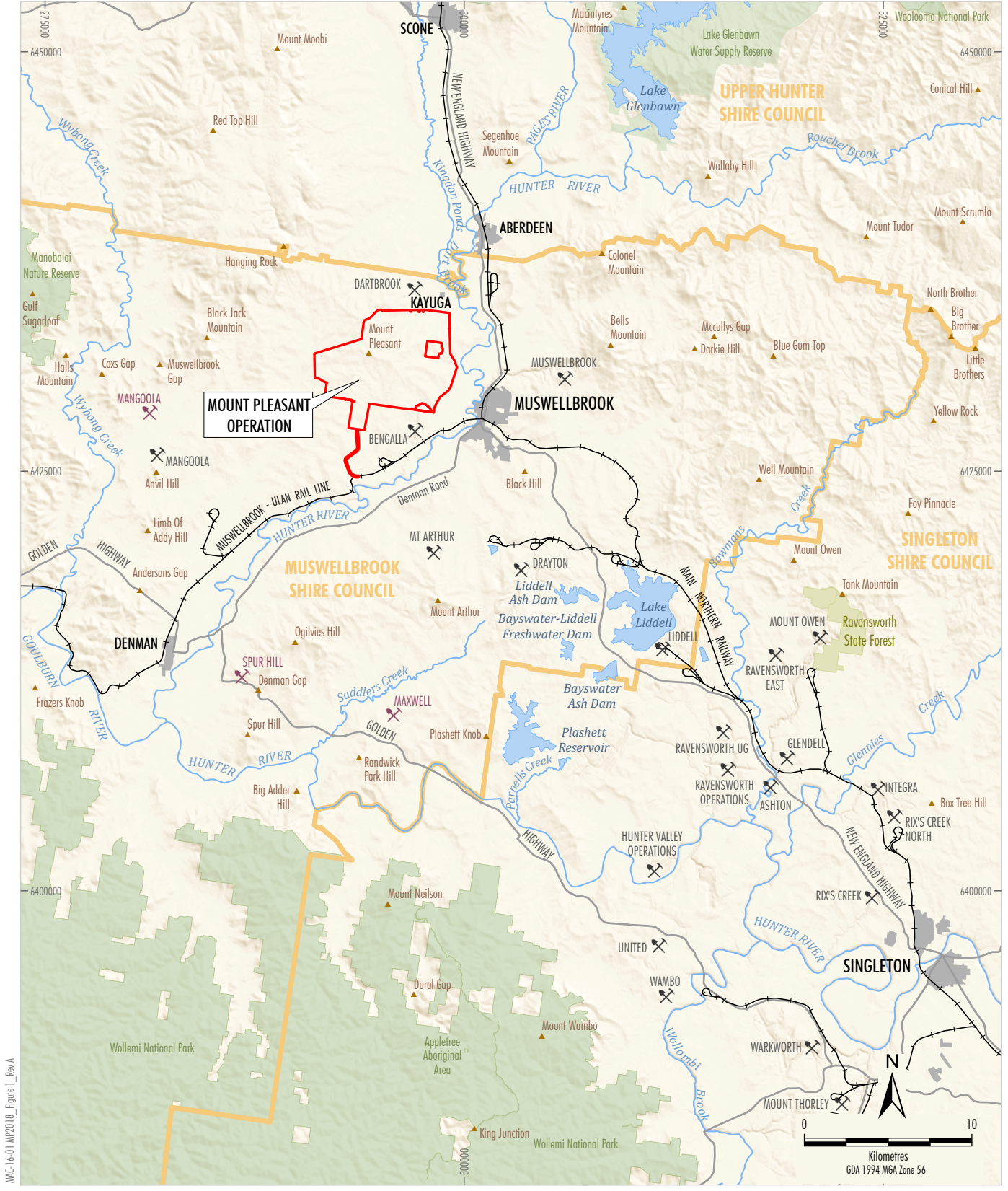
The MPO Mine Optimisation Modification (MOD 3) was submitted on 31 May 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017b). MOD 3 comprised an extension to the time limit on mining operations (to 22 December 2026) and extensions to the South Pit Eastern Out of Pit Emplacement to facilitate development of an improved final landform. MOD 3 was approved on 24 August 2018.

The MPO Rail Modification (MOD 4) was submitted on 18 December 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017c). MOD 4 proposed the following changes:

- duplication of the approved rail spur, rail loop, conveyor and rail load-out facility and associated services;
- duplication of the Hunter River water supply pump station, water pipeline and associated electricity supply that followed the original rail spur alignment; and
- demolition and removal of the redundant approved infrastructure within the extent of the Bengalla Mine, once the new rail, product loading and water supply infrastructure has been commissioned and is fully operational.

MOD 4 was approved on 16 November 2018 by the Secretary of the Department of Planning and Environment (DPE) (under Delegation). Appendix 2 of the modified Development Consent DA 92/97 illustrates the Conceptual Project Layout Plan of the approved MPO at 2021 and 2025, Approved Surface Disturbance Plan and Conceptual Final Landform (Attachment 1) incorporating the MOD 4 infrastructure relocations.





AMC-16-01-IMP2018\_Figure 1\_Rev A



- LEGEND**
- Mining Operation
  - Proposed Mining Operations (Application Lodged)
  - Mining Lease Boundary (Mount Pleasant)
  - Railway
  - Local Government Boundary
  - State Forest
  - National Parks and Wildlife Estate

Source: Geoscience Australia (2006); NSW Division of Resources & Geoscience (2017); Office of Environment and Heritage NSW (2017); Land and Property Information (2017)

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**MOUNT PLEASANT OPERATION**  
 Project Location

Figure 1

## 2 PURPOSE AND SCOPE

This Air Quality and Greenhouse Gas Management Plan (AQMP) has been prepared by MACH Energy to satisfy the requirements of Condition 23, Schedule 3 of Development Consent DA 92/97 (Table 1).

**Table 1  
Specific Development Consent Conditions**

MPO Development Consent DA 92/97 Schedule 3	Section Where Addressed in this AQMP
<p>23. <i>The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Secretary. This plan must:</i></p> <p>(a) <i>be submitted to the Secretary for approval prior to carrying out any development on site;</i></p> <p>(b) <i>describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, including a real-time air quality management system that employs reactive and proactive mitigation measures;</i></p> <p>(c) <i>include an air quality monitoring program that:</i></p> <ul style="list-style-type: none"> <li>• <i>uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development;</i></li> <li>• <i>includes PM<sub>2.5</sub> monitoring (although this obligation could be satisfied by the regional air quality monitoring network if sufficient justification is provided);</i></li> <li>• <i>includes a protocol for determining exceedances of the relevant conditions of this consent; and</i></li> </ul> <p>(d) <i>include a protocol that has been prepared in consultation with the owners of nearby mines to minimise the cumulative air quality impacts of the mines.</i></p> <p><i>The Applicant must implement the management plan as approved by the Secretary.</i></p>	<p>This document</p> <p>This document is to be approved by the DPE Sections 7, 9, 10 and 11</p> <p>Section 10 Section 10.1</p> <p>Section 10.1.3</p> <p>Section 10.3</p> <p>Section 9.8</p>

This AQMP describes the management of air quality and greenhouse gases associated with construction and operation of the MPO, in accordance with Development Consent DA 92/97.

The AQMP applies to all employees and contractors at the MPO and covers all areas within the MPO boundary. The AQMP applies to the life of the MPO, including (but not limited to) the period of mining operations specified in Development Consent DA 92/97, which currently permits mining until 22 December 2026. As required by Condition 5, Schedule 2 of Development Consent DA 92/97, the AQMP will continue to apply (excluding mining operations) beyond 22 December 2026, as required, until the rehabilitation and any additional undertakings (required by the Secretary of the DPE, or the Division of Resources and Geoscience [DRG] within the DPE) have been carried out satisfactorily.



## **2.1 PREVIOUS VERSIONS**

A previous version of the AQMP was submitted by Coal & Allied as a Construction Air Quality Management Plan (CAQMP) and was approved in 2012. The CAQMP was submitted as a staged plan limited to potential air quality impacts from construction activities.

A revised version of the CAQMP was submitted by Coal & Allied in 2015 and approved on 2 October 2015. As per the previous version of the CAQMP, this plan was limited to construction activities at the MPO, excluding the development of the box-cut and any activities related to the extraction of coal.

A new version of the AQMP was prepared by MACH Energy to replace the CAQMP described above. Consistent with Condition 23, Schedule 3 of Development Consent DA 92/97, this version of the AQMP was prepared to allow for both construction and operation of the MPO and was approved on 15 June 2017.

A new version of the AQMP was required to relocate site monitoring locations to more accurately reflect air quality near sensitive receivers. In particular, monitors A-HV2 and A-PF2, and weather mast M-WM2, were relocated approximately 800 metres to the south-east. The revised AQMP was approved on 31 January 2018.

## **2.2 CURRENT VERSION**

The current version of the AQMP was required to:

- Reflect the approval of MOD 3 and 4 (24 August 2018 and 16 November 2018, respectively).
- Update site monitoring locations to more accurately reflect air quality near sensitive receivers, consistent with variations to Environment Protection Licence [EPL] 20850.
- Update the real-time response triggers based on the revised EPL 20850 approved on 1 May 2019.

### **3 FORMAT OF THE PLAN**

This AQMP consists of the following sections:

- Section 1: Introduction.
- Section 2: Purpose and Scope – describes particular components of this AQMP as specified in the development consent conditions.
- Section 3: Format of the Plan.
- Section 4: Statutory Obligations – MACH Energy’s statutory requirements and other obligations applicable to this AQMP.
- Section 5: Existing Environment – outlines the existing environment including baseline data and sensitive receptors in the vicinity of the MPO.
- Section 6: Air Quality Criteria – outlines the relevant criteria applicable to the MPO.
- Section 7: Performance Indicators – outlines the specific performance indicators that MACH Energy proposes to use to guide the implementation of the air quality management measures and judge their performance.
- Section 8: Dust Generating Sources – describes potential dust generating activities at the MPO including mining activities.
- Section 9: Air Quality and Greenhouse Gas Management and Control Measures – describes the management and control measures to be implemented, where relevant, at the MPO.
- Section 10: Air Quality Monitoring Program – outlines the air quality monitoring program components including locations, frequency and parameters.
- Section 11: Contingency Plan – provides a contingency plan to manage unprecedented impacts and their consequences.
- Section 12: Review and Improvement of Environmental Performance – provides details of the review process (through the Annual Review and revisions of this AQMP) and improvement of the environmental performance of the MPO (through the Independent Environmental Audit and revisions of this AQMP).
- Section 13: Reporting Procedures – describes the management and reporting of incidents, complaints and non-compliances.
- Section 14: References – provides references cited in this AQMP.

## 4 STATUTORY OBLIGATIONS

Activities at the MPO will be managed in accordance with a number of licences, permits and leases which have been issued or are pending issue.

MACH Energy’s statutory obligations are contained in:

- the conditions of Development Consent DA 92/97;
- the conditions of the Commonwealth Approval EPBC 2011/5795;
- relevant licences (including EPL 20850), permits and mining leases (MLs) (ML 1645, ML 1708, ML 1709 and ML 1713); and
- other relevant legislation.

In addition, MACH Energy operates in accordance with the approved MPO Mining Operations Plan, as amended from time to time.

Obligations relevant to this AQMP are described below.

### 4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 DEVELOPMENT CONSENT

The conditions of Development Consent DA 92/97 relevant to the content and structure of this AQMP are described below. A comprehensive list of all conditions in Development Consent DA 92/97 relevant to air quality and greenhouse gas is provided in Appendix A.

#### 4.1.1 Air Quality and Greenhouse Gas Management Plan Requirements

Condition 23, Schedule 3 of Development Consent DA 92/97 requires the preparation of an AQMP (refer Table 1).

#### 4.1.2 Management Plan (General) Requirements

Condition 2, Schedule 5 of Development Consent DA 92/97 outlines the general management plan requirements that are applicable to the preparation of this AQMP. Table 2 presents these requirements and indicates where each is addressed within this AQMP.

**Table 2  
General Development Consent Conditions**

MPO Development Consent DA 92/97 Schedule 5	AQMP Section
2. <i>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</i> (a) <i>detailed baseline data;</i> (b) <i>a description of:</i> <ul style="list-style-type: none"> <li>• <i>the relevant statutory requirements (including any relevant consent, licence or lease conditions);</i></li> <li>• <i>any relevant limits or performance measures/criteria;</i></li> <li>• <i>the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</i></li> </ul>	Section 5  Section 4  Section 6  Section 7

**Table 2  
General Development Consent Conditions (Continued)**

MPO Development Consent DA 92/97 Schedule 5	AQMP Section
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Sections 7, 9, 10 and 11
(d) a program to monitor and report on the: <ul style="list-style-type: none"> <li>• impacts and environmental performance of the development;</li> <li>• effectiveness of any management measures (see c above);</li> </ul>	Section 12
(e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 11
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 12
(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>• incidents;</li> <li>• complaints;</li> <li>• non-compliances with statutory requirements; and</li> <li>• exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul>	Section 13
(h) a protocol for periodic review of the plan. <i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Section 12.2

#### 4.2 OTHER LEGISLATION

Other NSW Acts and Regulations that may be applicable to air quality at the MPO include, but are not limited to, the:

- *Protection of the Environment Operations Act, 1997 (POEO Act);*
- *Protection of the Environment Operations (General) Regulation, 2009;*
- *Protection of the Environment Operations (Clean Air) Regulation, 2010;*
- *Work Health and Safety Act, 2011;*
- *Work Health and Safety Regulation, 2011;*
- *Work Health and Safety (Mines) Act, 2013; and*
- *Work Health and Safety (Mines) Regulation, 2014.*

Other guidelines and standards that were considered during the preparation of this AQMP include, but are not limited to, the *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (NSW Department of Environment and Conservation [DEC], 2007) and the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (NSW Environment Protection Authority [EPA], 2017).

## 5 EXISTING ENVIRONMENT

The MPO is located in the Upper Hunter Valley of NSW, north-west of Muswellbrook and approximately 50 km north-west of Singleton (Figure 1). The villages of Aberdeen and Kayuga are located approximately 5 km north-northeast and 1 km north of the MPO boundary, respectively.

The substances considered in this AQMP are those identified in Development Consent DA 92/97 that have potential to affect the general health and amenity of the community and the surrounding environment. This includes particulate matter, which refers to particles of varying size and composition that are defined as follows:

- Total Suspended Particulate matter (TSP) – refers to the total dust particles that are suspended in the air and nominally defined with an upper size range of 30 micrometres ( $\mu\text{m}$ ).
- $\text{PM}_{10}$  – refers to particulate matter with an aerodynamic diameter less than or equal to 10  $\mu\text{m}$ .
- $\text{PM}_{2.5}$  – refers to particulate matter with an aerodynamic diameter less than or equal to 2.5  $\mu\text{m}$ .
- Deposited dust – refers to the largest dust particles in the air. These particles rarely travel far from the source as they rapidly settle under gravity.

Other relevant substances considered in this plan are odorous compounds (generally associated with spontaneous combustion events) and oxides of nitrogen (generally associated with blast fumes).

### 5.1 BASELINE DATA

Dust in the vicinity of the MPO has been monitored by a series of dust gauges that measure deposited dust on a monthly basis. Other dust monitoring parameters are measured by the neighbouring mines Bengalla Mine and Mt Arthur Coal Mine and by the Upper Hunter Air Quality Monitoring Network in Muswellbrook.

The Hunter Valley runs along a north-west/south-east axis through the Great Dividing Range and gives rise to the distinct channelling of winds along this axis that is prevalent in much of the area. Almost no winds originate from the north-east and south-west quadrants. The local topography plays an important role in steering and channelling the wind, generating turbulence and large scale eddies, which all influence the dispersion of pollutants. Other influences in the Hunter Valley include the night-time drainage flows (katabatic winds) that transport air from the mountains down across the valley as well as the daytime flows that transport the air back upslope.

There is also a strong seasonal variation in the prevailing wind direction in the Hunter Valley, with winds during summer originating predominantly from the south-eastern quadrant with fewer winds originating from the north-western quadrant. During winter, this pattern is reversed and winds from the north-west are dominant. Spring and autumn are a combination of these two trends. This is a common seasonal pattern found throughout the Hunter Valley and is shown in the wind roses presented in the 1997 EIS (ERM Mitchell McCotter, 1997).

#### 5.1.1 Mount Pleasant Mine Environmental Impact Statement 1997

The following describes the baseline data reported in the 1997 EIS (ERM Mitchell McCotter, 1997).



### Dust Deposition

Existing atmospheric dust levels at Muswellbrook are generated by a variety of sources including plant pollen, farming activities such as ploughing, wind erosion from bare surfaces, traffic on sealed and unsealed roads, coal mining and power generation. Domestic wood or coal fires also add to the particulate matter in the air. A monitoring program was established in 1992 to determine the existing, or background, dust levels for the 1997 EIS (ERM Mitchell McCotter, 1997).

A network of 14 dust deposition gauges was used to determine monthly rates of dustfall at various locations in the area. The mean deposition rates at each of the 14 sampling sites are summarised in Table 3 and the monitoring locations are shown on Figure 2.

**Table 3**  
**Mean Annual Dust Deposition**

Site	Deposition Rate (g/m <sup>2</sup> /month)				Total Number of Measurements
	1993	1994	1995	1996	
D1	0.6	0.6	0.7	0.5	45
D2	1.4	1.5	1.5	1.3	45
D3	2.0	2.1	2.0	1.2	45
D4	1.5	2.7	1.6	1.0	40
D5	1.4	1.3	1.1	1.6	42
D6	1.1	1.3	1.2	0.9	44
D7	1.4	1.0	1.1	1.1	43
D8	1.5	0.8	1.1	1.0	40
D9	0.8	0.8	0.7	0.4	43
D10	1.1	1.5	0.7	1.2	41
D11	1.5	1.0	1.0	1.2	41
D12	0.5	0.5	0.5	0.6	45
D13	0.8	1.4	1.2	0.9	43
D14	1.3	1.7	1.4	1.2	44
Average	1.2	1.3	1.1	1.0	

g/m<sup>2</sup>/month = grams per square metre per month.

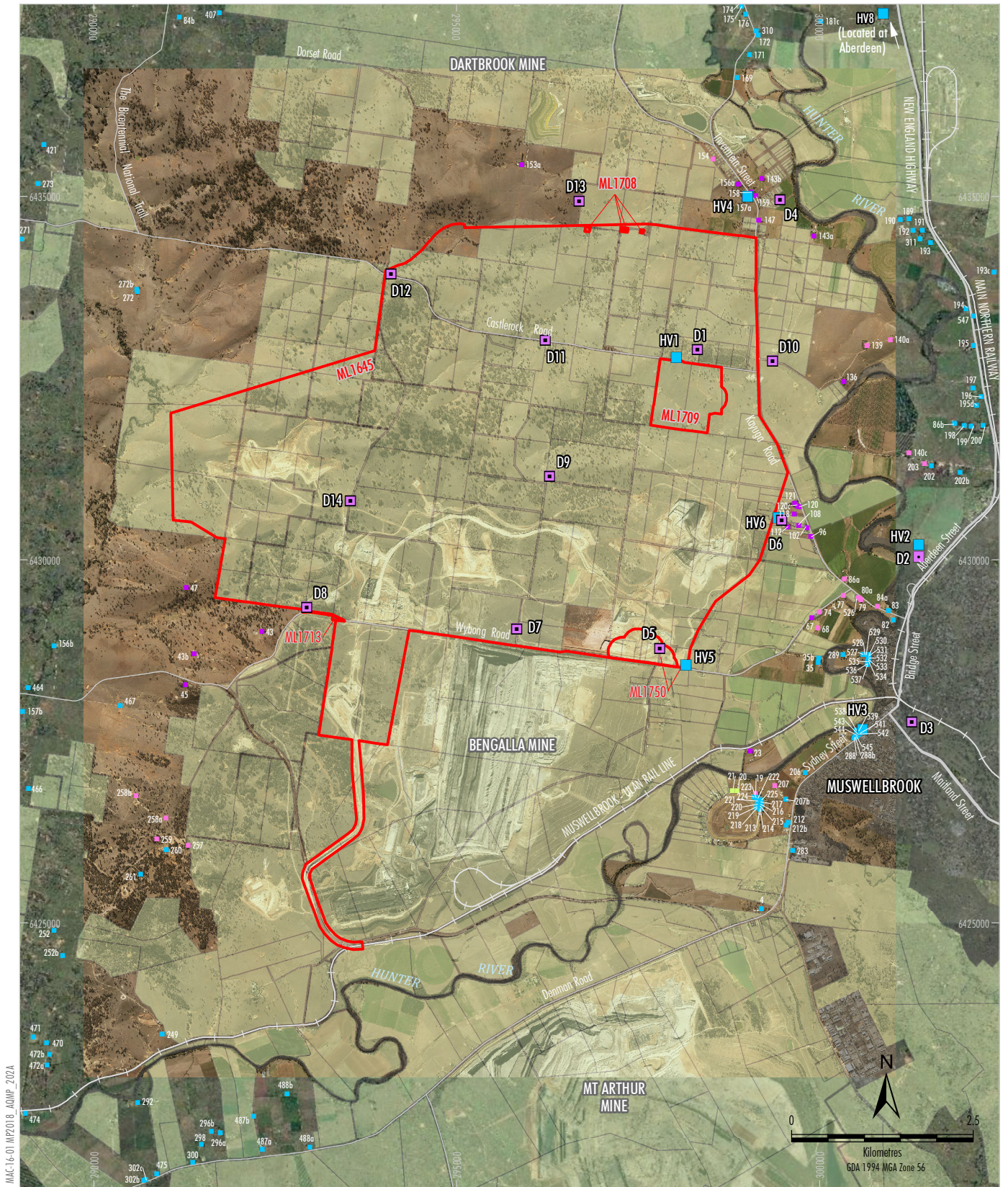
Source: ERM Mitchell McCotter, 1997.

Mean annual rates of dust deposition were consistently less than 2.0 g/m<sup>2</sup>/month. The exceptions were site D4, near Kayuga, with 2.7 g/m<sup>2</sup>/month in 1994 and site D3, near Muswellbrook, which recorded an annual mean of 2.1 g/m<sup>2</sup>/month in 1994. The average of all sites over each year was 1.2 g/m<sup>2</sup>/month in 1993, 1.3 g/m<sup>2</sup>/month in 1994, 1.1 g/m<sup>2</sup>/month in 1995 and 1.0 g/m<sup>2</sup>/month in 1996.

### Total Suspended Particulates and PM<sub>10</sub>

Monitoring of TSP and PM<sub>10</sub> was undertaken on a one-day-in-six cycle at seven monitoring sites in 1993 and 1994 (HV1 to HV6 and HV8, Figure 2). Mean values for TSP were calculated and are summarised in Table 4.





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- LEGEND**
- Mining Lease Boundary
  - Mine Owned
  - Privately-owned Residence - MPO Acquisition on Request
  - Privately-owned Residence - MPO Mitigation/Acquisition on Request \*
  - Privately-owned Residence - MPO Mitigation on Request
  - Other Privately-owned Residence
  - Monitoring Site
  - Dust Deposition Gauge
  - High Volume Air Sampler

\* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2019)  
 Orthophoto: MACH Energy (July 2018); NSW Department of Finance & Innovation (2018)

**MACH Energy**  
 MOUNT PLEASANT OPERATION  
 1997 EIS Air Quality  
 Monitoring Sites

**Figure 2**



**Table 4**  
**Mean Annual Total Suspended Particulate Concentrations**

Site	Concentration ( $\mu\text{g}/\text{m}^3$ )		Total Number of Measurements	
	1993	1994	1993	1994
HV1	20.4	28.0	10	16
HV2	37.4	48.7	7	13
HV3	33.7	40.8	11	22
HV4	21.7	38.5	15	19
HV5	30.0	43.5	15	12
HV6	38.2	40.2	13	14
HV8	42.4	51.7	30	11

Source: ERM Mitchell McCotter, 1997.

Note:  $\mu\text{g}/\text{m}^3$  = micrograms per cubic metre.

Dust concentration values, determined as geometric means measured over periods of 24 hours, ranged from 20 to 42  $\mu\text{g}/\text{m}^3$  in 1993 and 28 to 52  $\mu\text{g}/\text{m}^3$  in 1994 (Table 4). The consistently higher mean concentrations in 1994 were most likely due to dry weather conditions throughout much of the year.

A total of 21 samples of  $\text{PM}_{10}$  were collected during monitoring intervals in 1993 and 1994. Nineteen of the 21 samples collected had 24 hour concentrations of  $\text{PM}_{10}$  ranging from 8 to 33  $\mu\text{g}/\text{m}^3$ . Two samples collected in early October 1994, at the peak of the drought, recorded 24 hour concentrations of 70  $\mu\text{g}/\text{m}^3$  at HV1 (within the site) and 76  $\mu\text{g}/\text{m}^3$  at HV6 (near the eastern boundary of the site).

### 5.1.2 Annual Environmental Management Reports

Following the 1997 EIS, the objective of air quality management at the MPO was to monitor the background or baseline dust levels prior to the commencement of the MPO mining activities.

Monitoring of the background or baseline dust deposition levels at the MPO has been reported in the relevant Annual Environmental Management Reports. Figure 2 displays the dust deposition monitoring network that has been used at the MPO for background or baseline dust levels.

Monitoring reported in the Annual Environmental Management Reports has identified exceedances of the EPA annual impact assessment criteria (4  $\text{g}/\text{m}^2/\text{month}$ ) at the following locations (Appendix B) (Coal & Allied, 2011; 2012; 2013; 2014; 2015; 2016):

- Site D7 (15.0  $\text{g}/\text{m}^2/\text{month}$  in 2010, 12.1  $\text{g}/\text{m}^2/\text{month}$  in 2011, 13.0  $\text{g}/\text{m}^2/\text{month}$  in 2012, 11.5  $\text{g}/\text{m}^2/\text{month}$  in 2013, 11.0  $\text{g}/\text{m}^2/\text{month}$  in 2014 and 5.8  $\text{g}/\text{m}^2/\text{month}$  in 2015).
- Site D8 (4.1  $\text{g}/\text{m}^2/\text{month}$  in 2013).
- Site D10 (4.2  $\text{g}/\text{m}^2/\text{month}$  in 2013).

Site D7 is located in close proximity to the northern boundary of the Bengalla Mine main pit. Review of the dust deposition results recorded for the Bengalla Mine shows that depositional dust levels are generally greater in the proximity of the mining operation extending out to the north-west and south-southeast corresponding with the predominant wind directions.

Excluding site D7, the mean annual average dust deposition at all gauges for the period 2010 to 2015 was approximately 1.9  $\text{g}/\text{m}^2/\text{month}$ .

### 5.1.3 Muswellbrook NW Data

Ambient PM<sub>10</sub> levels measured by the Muswellbrook NW Upper Hunter Air Quality Monitoring Network Monitor for the period 2012 to 2015 are provided in Table 5.

**Table 5**  
**PM<sub>10</sub> Levels Measured at the Muswellbrook NW Monitor**

Year	Annual Average Concentration (µg/m <sup>3</sup> )	24 hour Average	
		Maximum Concentration (µg/m <sup>3</sup> )	Number of Days Exceeding 50 µg/m <sup>3</sup> (days)
2012	19.1	55.8	1
2013	18.9	52.4	3
2014	19.2	50.8	1
2015	16.7	72.9	2

Source: Upper Hunter Air Quality Monitoring Network.

## 5.2 METEOROLOGICAL CONDITIONS

A meteorological station was originally established on-site as part of the monitoring program. The station was located north of Castlerock Road and approximately 1 km west of Kayuga Road. A second meteorological station was established near the south-east corner of the site. The aim of the second station was to account for any differences in meteorological conditions between the flatter areas of the Hunter River floodplain and the more elevated terrain of the site represented by the permanent station.

Data from the stations confirm the north-west to south-east axis of the prevailing winds. Variations between the stations indicated that the land nearer the Hunter River experienced generally lower wind strengths. The site adjacent to the floodplain also tended to experience north to north-easterly air flow at night while the more elevated station recorded winds from the north-west and north-northwest.

These differences indicate that the area between the site and Muswellbrook experiences less frequent strong north-westerlies than the site.

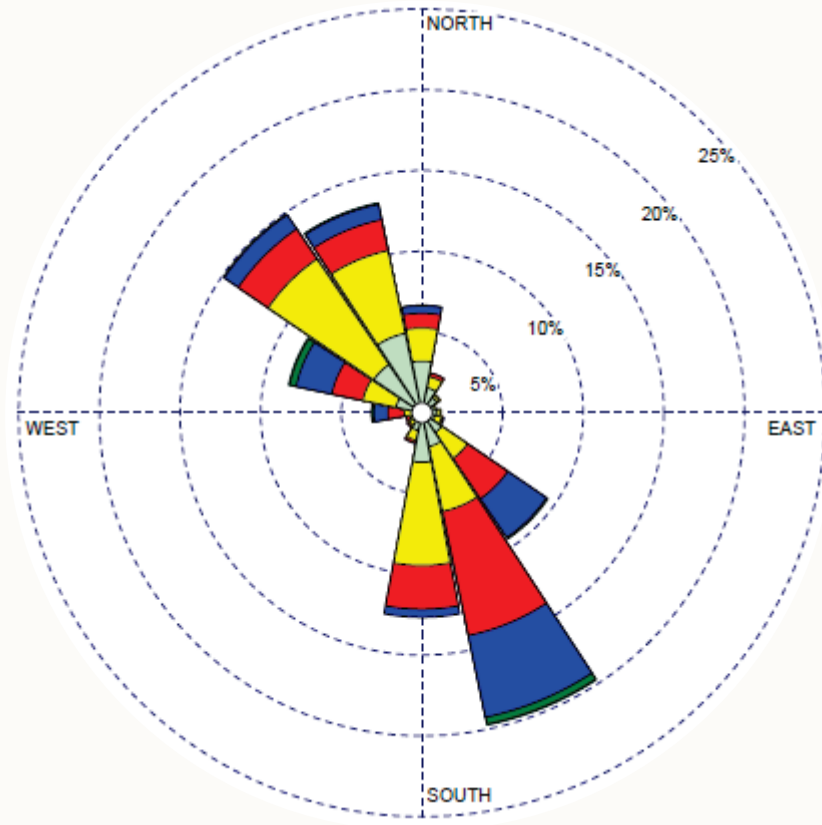
A typical wind rose is illustrated on Figure 3, and displays wind direction and speed as a percentage of time for 2015.

## 5.3 SENSITIVE RECEPTORS

Relevant receptors that may experience air quality impacts from activities associated with the MPO are shown on Figure 4. It should be noted that, subsequent to the issue of the Modified Development Consent DA 92/97 in September 2011, a number of formerly privately-owned residences have been acquired by the MPO or other mining operations.

An expanded list of sensitive residences is provided in Appendix C.

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LEGEND  
Wind Speed (m/s)

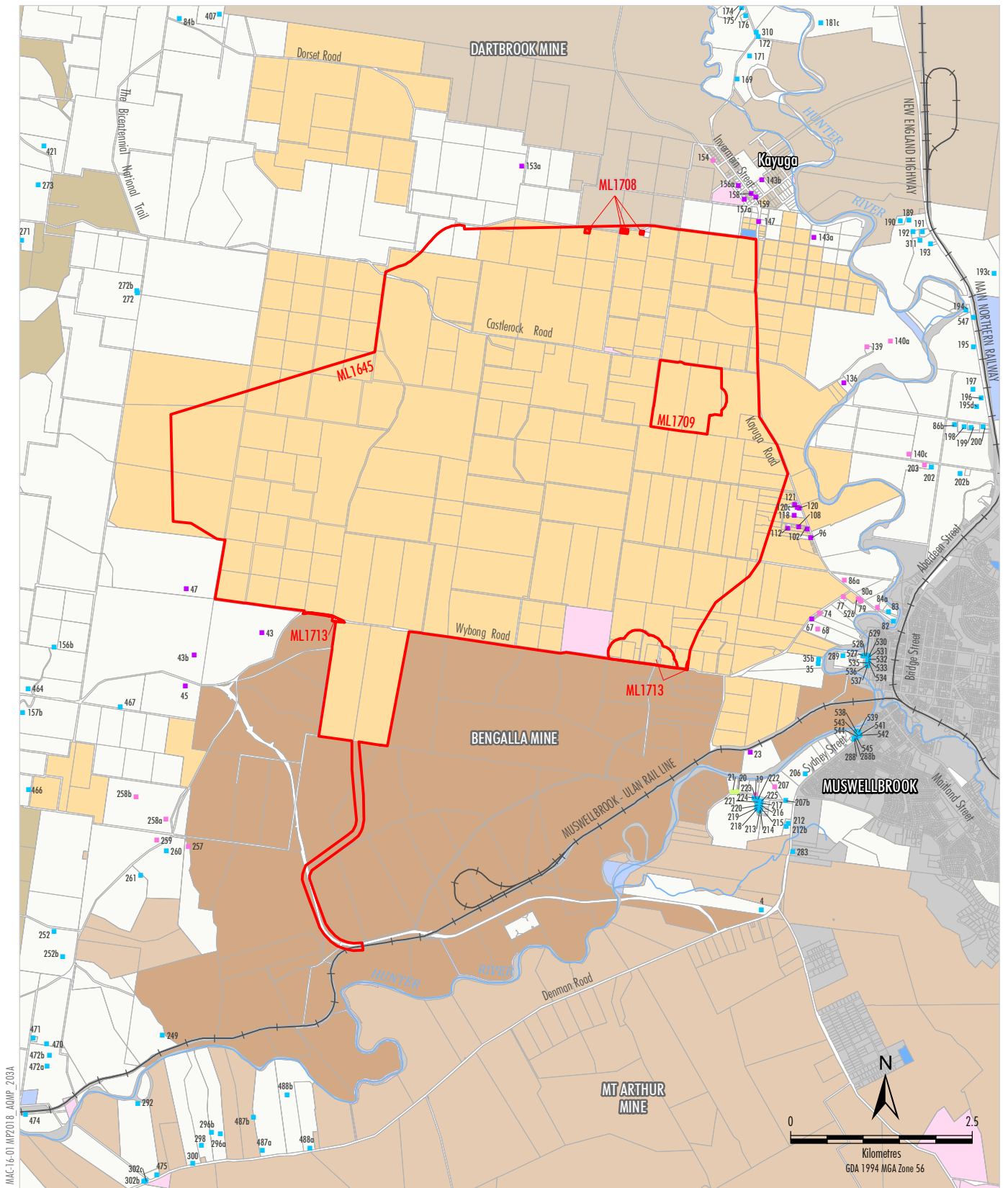
- > 11.1
- 8.8 - 11.1
- 5.7 - 8.8
- 3.6 - 5.7
- 2.1 - 3.6
- 0.5 - 2.1
- Calms : 0.47%

Source: AECOM (2016)

**MACH**Energy  
MOUNT PLEASANT OPERATION  
2015 Wind Rose

Figure 3





MAC-16-01 IMP2018\_ACOMP\_203A

**LEGEND**

- Mining Lease Boundary
- Privately-owned Residence - MPO Acquisition on Request
- Privately-owned Residence - MPO Mitigation/Acquisition on Request \*
- Privately-owned Residence - MPO Mitigation on Request
- Other Privately-owned Residence

\* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.

- Muswellbrook and Upper Hunter LEPs Zones B2, B5, IN1, SP2, R2, R5, RE1, RE2 and W1
- Crown
- Crown/State of NSW
- The State of NSW
- Muswellbrook Shire Council
- Upper Hunter Shire Council
- Mount Pleasant Controlled
- Bengalla Controlled
- Dartbrook Controlled
- Mt Arthur Controlled
- Other Mining/Resource Company Controlled
- Privately Owned Land

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2019)

**MACH Energy**  
 MOUNT PLEASANT OPERATION  
 Relevant Sensitive Receivers

**Figure 4**

## 6 AIR QUALITY CRITERIA

### 6.1 DEVELOPMENT CONSENT DA 92/97

#### 6.1.1 Air Quality Criteria

Condition 20, Schedule 3 of Development Consent DA 92/97 requires that, except for the air quality-affected land subject to acquisition upon request, MACH Energy shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not exceed the criteria listed in Tables 6, 7 or 8 at any residence on privately-owned land.

**Table 6**  
**Long Term Criteria for Particulate Matter**

Pollutant	Averaging Period	<sup>d</sup> Criterion
Total suspended particulate (TSP) matter	Annual	<sup>a</sup> 90 µg/m <sup>3</sup>
Particulate matter <10 µm (PM <sub>10</sub> )	Annual	<sup>a</sup> 25 µg/m <sup>3</sup>
Particulate matter <2.5 µm (PM <sub>2.5</sub> )	Annual	<sup>a</sup> 8 µg/m <sup>3</sup>

Source: Development Consent DA 92/97.

**Table 7**  
**Short Term Criterion for Particulate Matter**

Pollutant	Averaging Period	<sup>d</sup> Criterion
Particulate matter <10 µm (PM <sub>10</sub> )	24 hour	<sup>b</sup> 50 µg/m <sup>3</sup>
Particulate matter <2.5 µm (PM <sub>2.5</sub> )	24 hour	<sup>b</sup> 25 µg/m <sup>3</sup>

Source: Development Consent DA 92/97.

**Table 8**  
**Long Term Criteria for Deposited Dust**

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

Source: Development Consent DA 92/97.

Notes to Tables 6 to 8:

µg/m<sup>3</sup> = micrograms per cubic metre; g/m<sup>2</sup>/month = grams per square metre per month.

- <sup>a</sup> Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources);
- <sup>b</sup> Incremental impact (i.e. incremental increase in concentrations due to the development on its own);
- <sup>c</sup> 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
- <sup>d</sup> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

#### 6.1.2 Acquisition Criteria

Condition 1, Schedule 3 of Development Consent DA 92/97 requires that, upon receiving a written request for acquisition from the owner of the land listed in Table 9, MACH Energy shall acquire the land in accordance with the procedures in Condition 6 and Condition 7, Schedule 4 of Development Consent DA 92/97.

**Table 9**  
**Land Subject to Acquisition Upon Request**

Basis	Receiver
Noise	23, 45, 47, 67, 96, 102, 108, 112, 118, 120, 120c, 121, 136, 143a, 143b, 143c, 143d, 143e, 147, 153a, 153b, 156a, 157a, 158, 159, 447, 448, 449
Noise & Air	43, 43b
Air	20, 21

Source: Development Consent DA 92/97.

Notes:

- To identify the locations referred to in Table 9, see Figure 4.
- MACH Energy is only required to acquire and/or install mitigation measures at receivers 20 and 21 if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.
- Receivers 143c, 143d, 143e, 153b, 447, 448 and 449 are vacant lots of land with no dwellings.

### 6.1.3 Additional Mitigation Criteria

Condition 2, Schedule 3 of Development Consent DA 92/97 requires MACH Energy, upon receiving a written request from the owner of any residence on the land listed in Table 9 or Table 10, to implement additional noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) and/or air quality mitigation measures (such as air filters, first flush roof water drainage system and/or air conditioning), as relevant, at the residence in consultation with the landowner.

These measures must be reasonable and feasible and related to the noise and/or dust impacts on the residence. MACH Energy is responsible for the reasonable costs of ongoing maintenance of these additional measures until the cessation of mining operations.

**Table 10**  
**Land Where Additional Mitigation Measures are Available on Request**

Basis	Receiver
Noise	19, 20, 21, 68, 74, 77, 79, 80a, 84a, 86a, 139, 140a, 140c, 154, 203, 207, 257, 258, 259, 526

Source: Development Consent DA 92/97.

Notes:

- To identify the locations referred to in Table 10, see Figure 4.

If MACH Energy and the owner cannot agree on the measures to be implemented within three months of receiving this request from the owner, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary of the DP&E for resolution.

### 6.1.4 Operating Conditions

Condition 22, Schedule 3 of Development Consent DA 92/97 requires that MACH Energy:

- implement best practice air quality management, including all reasonable and feasible measures to minimise the odour, fume and dust emissions of the development;*
- minimise visible air pollution generated by the development;*
- minimise, where reasonable and feasible, the extent of potential dust generating surfaces exposed on the site at any given point in time;*

- (d) *minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note d above under Tables 8-10);*
- (e) *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*
- (f) *co-ordinate the air quality management on site with the air quality management at nearby mines (including the Bengalla Mine) to minimise cumulative air quality impacts from the mines,*

*to the satisfaction of the Secretary.*

### **6.1.5 Notifications**

Condition 2, Schedule 4 of Development Consent DA 92/97 requires that, as soon as practicable after obtaining monitoring results showing exceedance of the relevant criteria in Schedule 3, MACH Energy shall notify the affected landowner and tenants in writing of the exceedance, and provide regular monitoring results to each of these parties until the development is complying with the relevant criteria again.

## **6.2 OTHER LICENCE CONDITIONS**

Air quality criteria and other air quality related conditions stipulated in EPL 20850 are generally consistent with those prescribed in Development Consent DA 92/97, with the exception of Conditions O3.4 to O3.9, which state:

### **O3 Dust**

...

O3.4 *The licensee must cease all dust generating activities during adverse conditions being the occurrence of both the adverse wind conditions set out in Condition O3.5 (b) and the adverse PM<sub>10</sub> concentrations set out in Condition O3.5(c).*

O3.5 *For the purpose of Condition O3.4 the following definitions apply.*

*(a) 'dust generating activities' means drilling, blasting, earthworks, construction activities, all hauling activities on unsealed haul roads, all overburden and coal extraction operations including loading and dumping activities and grader, loader, dozer and dragline operations.*

*(b) 'adverse wind conditions' means a rolling 1-hour average wind direction between 250 degrees and 340 degrees (inclusive) measured at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitor.*

*Australian Standard AS3580.14-2014 is to be used to calculate the rolling 1 hour average wind direction*

*(c) 'adverse PM<sub>10</sub> concentrations' means a rolling 24-hour average PM<sub>10</sub> concentration of equal to or greater than 44 micrograms per cubic metre measured at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station.*

*(d) Operation of watercarts is permitted at all times.*

*(e) Activities within the Coal Handling and Preparation Plant and Materials Handling Area, including run-of-mine (ROM) coal, product coal handling (including dozer/loader operations) and train loading operations ... are not included as dust generating activities provided all automated dust suppression spray systems at the ROM hopper, conveyor transfer points and product stockpiles are in use, at least one water cart is in use on the ROM stockpile and an adjustable hood is lowered onto rail wagons loadings.*

O3.6 *Shutdown of dust generating activities required by Condition O3.4 must be completed within 1 hour of receiving data that triggers action required by Condition O3.4.*

- O3.7 *The licensee may resume dust generating activities at the premises when:*
- (a) adverse wind conditions as defined in Condition O3.5(b); or*
  - (b) adverse PM<sub>10</sub> concentrations as defined in Condition O3.5(c)*
- are not measured for a minimum time period of 1 hour from the time that cessation of dust generation activities is completed.*
- O3.8 *At any time when there is no access to the meteorological data or PM<sub>10</sub> data from the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station, definitions of 'adverse wind conditions' and 'adverse PM<sub>10</sub> concentrations' in condition O3.5 are replaced with:*
- 'adverse wind conditions' means a rolling 1-hour average wind direction between 245 and 345 degrees (inclusive) measured at Monitoring Point No. 11, identified in condition P1.3*
  - 'adverse PM<sub>10</sub> concentrations' means a 24-hour average PM<sub>10</sub> concentration of equal to or greater than 44 micrograms per cubic metre measured at the Monitoring Point No. 1, identified in condition P1.3*
- Note: If at any time, there is no access to the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station and to either 1-hour average wind direction data from monitoring point 11 or PM<sub>10</sub> data from monitoring point 1 the licensee must cease dust generating activities at the premises.*
- O3.9 *For the purpose of condition O3.5 (e), dust suppression systems must be operated in a manner to ensure that there is no visible dust emissions emitted from the premises.*



## **7 PERFORMANCE INDICATORS**

The following air quality related performance indicators will be used to judge the performance of the MPO:

- effective implementation of the Real-time Response Protocol for air quality (Section 9.4);
- results of monitoring are compliant with the air quality criteria in Section 6; and
- complaints are minimised and appropriate management actions are implemented following receipt of a complaint (Section 13.1).

Section 11 details the Contingency Plan to be implemented to manage any unpredicted impacts. Sections 12 and 13 detail the reporting that will be undertaken by MACH Energy.

## **8 DUST GENERATING SOURCES**

The sources of dust emissions at the MPO are associated with the activities described in Sections 8.1 and 8.2.

### **8.1 CONSTRUCTION**

Typically, dust generating activities during construction may arise from:

- traffic on unsealed roads, or across unsealed surfaces;
- loading and unloading of materials;
- wind erosion from exposed areas;
- clearing of vegetation, topsoil stripping;
- dozers operating on material;
- stockpiling of materials, topsoil and gravels;
- drilling and blasting of materials;
- grading roads; and
- re-handling of material.

Relative to mining operations, the scale of emissions generated during construction will be small and there is low risk for any actual impact to occur at receptors.

### **8.2 OPERATION**

Significant dust generating activities identified for the site comprise:

- hauling of materials along unsealed roads;
- loading and unloading of materials;
- dozers operating on material;
- wind erosion from exposed areas;
- topsoil and subsoil stripping;
- wind erosion from stockpiles;
- drilling and blasting of materials;
- grading roads; and
- processing and handling of coal.

Note: that sources of dust may be small on an annual average basis but still have high emission rates for short periods, for example dust from a blast event or topsoil stripping. Thus all sources of dust need to be carefully considered.

## **9 AIR QUALITY AND GREENHOUSE GAS MANAGEMENT AND CONTROL MEASURES**

MACH Energy will implement best management practice to minimise the MPO's generation of dust, odour, fume and greenhouse gas emissions, in accordance with Condition 22, Schedule 3 of Development Consent DA 92/97.

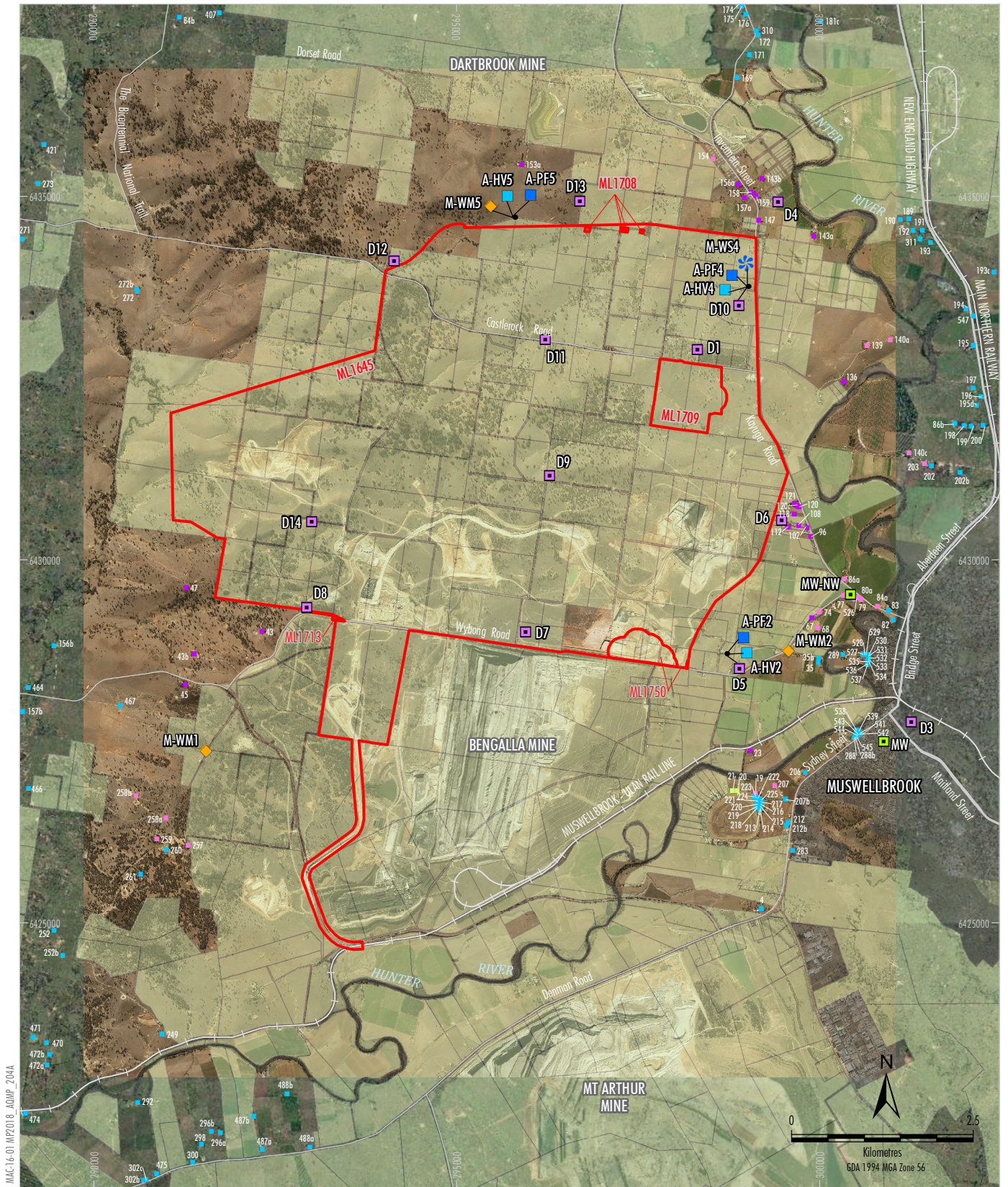
Management and control measures are outlined in Sections 9.2, 9.5 and 9.6, for dust, odour and fumes, and greenhouse gases, respectively. The proposed management measures are considered by MACH Energy to be consistent with best practice management.

The effectiveness of air quality and greenhouse gas management and control measures at the MPO will be assessed and continually improved through real-time and attended monitoring (Section 10).

### **9.1 ADVERSE WEATHER CONDITIONS**

Condition O3.5(b) in EPL 20850 defines “adverse wind conditions” for the MPO as a rolling 1 hour average wind direction between 250 degrees and 340 degrees (inclusive) measured at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitor (MW-NW on Figure 5). When data is not available from this monitor, Condition O3.8 in EPL 20850 defines “adverse wind conditions” as a rolling 1 hour average wind direction between 245 and 345 degrees (inclusive) measured at M-WM2 (Figure 5). The rolling 1 hour average will be calculated using Australian Standard AS3580.14-2014.





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- LEGEND**
- Mining Lease Boundary
  - Mine Owned
  - Privately-owned Residence - MPO Acquisition on Request
  - Privately-owned Residence - MPO Mitigation/Acquisition on Request \*
  - Privately-owned Residence - MPO Mitigation on Request
  - Other Privately-owned Residence
  - Monitoring Sites**
  - Air Quality - High Volume Sampler
  - Air Quality - Palas Fidas
  - Dust Deposition Gauge
  - Upper Hunter Air Quality Monitoring Network
  - ◆ Weather Mast
  - ✪ Weather Station

\* MPO Mitigation on Request - rail noise. MPO is only required to acquire and/or install air quality mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla Mine.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2019)  
 Orthophoto: MACH Energy (July 2018); NSW Department of Finance & Innovation (2018)

**MACHEnergy**  
 MOUNT PLEASANT OPERATION  
 Air Quality and Meteorological  
 Monitoring Sites

**Figure 5**



## 9.2 DUST MANAGEMENT AND CONTROL MEASURES

Air quality management measures at the MPO are generally consistent with best practice dust controls identified in the Office of Environment and Heritage document, *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (Katestone Environmental Pty Ltd, 2010). The primary measures that will be implemented to control/minimise dust emissions from the MPO are summarised in Table 11.

**Table 11**  
**Dust Management and Control Measures**

Target	Management and Control Measure
General	<ul style="list-style-type: none"> <li>• Mining operations will be reviewed following a real-time response trigger and dust generating activities will be modified, relocated and/or paused where required (Section 9.4).</li> <li>• Forecast meteorological conditions and air quality concentrations will be reviewed at least once per day (Section 9.3).</li> <li>• Site inductions will include air quality requirements to ensure employee and contractor awareness of potential dust impacts, especially with respect to the nearest receptors.</li> <li>• All machinery and plant used on-site will be maintained and operated in a proper and efficient manner in order to minimise dust generation.</li> </ul>
Disturbed Areas	<ul style="list-style-type: none"> <li>• Only the minimum area necessary for mining and associated infrastructure will be disturbed.</li> <li>• Overburden emplacement areas will be designed to minimise the disturbance area, and completed areas will be progressively reshaped and revegetated. Temporary cover crops will be used to stabilise rehabilitation areas if sowing of long term species is unlikely to occur within four weeks (waiting for more favourable sowing conditions in Autumn/Spring).</li> <li>• Temporary stabilisation of unused areas or dump slopes will be undertaken annually (e.g. cover crops would be established, preferentially in Autumn or Spring). Cover crops will be established on areas that are planned to be inactive for six months or more.</li> <li>• Cleared vegetation will be mulched and then used for stabilising rehabilitated landforms. This may include spreading of mulch and branches on completed overburden landforms.</li> <li>• Cleared areas will be watered during construction activities, as required.</li> </ul>
Material Stockpiling and Handling	<ul style="list-style-type: none"> <li>• Long-term stockpiles will be revegetated as soon as practicable following completion.</li> <li>• Water carts and/or sprays will be used on all coal handling and stockpile areas to minimise dust generation as necessary and practicable.</li> <li>• Material handling and stripping/ripping will be avoided or postponed if excessive dust lift off occurs. Material with low moisture content will be sprayed with water prior to and/or during handling if necessary and practicable to control visible dust.</li> <li>• The drop height will be minimised when loading or unloading material as far as practicable.</li> <li>• Spillage from loading/unloading will be minimised and cleaned up as soon as practicable.</li> </ul>
Roads	<ul style="list-style-type: none"> <li>• Consideration will be given to using the largest practical and cost-effective truck size for transporting coal and overburden.</li> <li>• Roads will be constructed in a proper manner and consideration will be given to constructing all major haul roads using material with low silt/fines content.</li> <li>• Speed limits will be imposed on all roads.</li> <li>• Watercarts will be utilised as necessary to minimise excessive visible dust.</li> <li>• Roads which are used infrequently will be watered or access suspended as appropriate and obsolete roads will be rehabilitated.</li> <li>• A system to track water application rates on major haul roads will be implemented.</li> <li>• Roads will be regularly maintained and/or cleaned to ensure a smooth surface and to prevent a build-up of loose material.</li> <li>• Road edges will be defined with marker posts or equivalent (where practicable).</li> <li>• Road vehicles will remain on formed roads and tracks, except as required for environmental management (e.g. survey/inspection work).</li> </ul>



**Table 11  
Dust Management and Control Measures (Continued)**

Target	Management and Control Measure
Drilling and Blasting	<ul style="list-style-type: none"> <li>• Blasting will be conducted in accordance with the Blast Management Plan.</li> <li>• Blasting will be conducted during daylight hours when dispersion conditions are favourable, unless otherwise required for safety reasons.</li> <li>• Production drill rigs will utilise water injection (or be fitted with dust mitigation, such as sprays) and dust aprons will be lowered during drilling. Production drill rigs will not be operated without adequate dust control.</li> <li>• Adequate stemming will be used in drill holes at all times.</li> </ul>
Coal Handling and Preparation Plant	<ul style="list-style-type: none"> <li>• Appropriate dust suppression methods (including enclosed ROM hoods, water sprays, fitting of conveyors with appropriate cleaning and collection devices and using 'hood and spoon' chutes) will be employed at the coal handling facilities, as required.</li> <li>• Where possible, conveyors, transfers and chutes will be enclosed or partially enclosed.</li> <li>• Areas where spilt material can build up will be regularly cleaned (e.g. under transfer chutes and conveyors, and paved areas).</li> <li>• Rail wagons will be loaded with a streamlined and consistent profile, where possible.</li> </ul>
Adverse Conditions and Contingency Actions	<ul style="list-style-type: none"> <li>• Mitigation will be implemented by the relevant contractors as required. Inspections of dust levels and weather conditions will continue regularly to assess the effectiveness of controls (Section 9.4).</li> <li>• Potential mitigating measures that will be implemented during adverse conditions include: <ul style="list-style-type: none"> <li>– scheduling of additional watercart(s) in advance;</li> <li>– scheduling of amended working hours or working locations during unfavourable dispersion conditions;</li> <li>– review of the elevation and wind exposure of activities and, where possible, relocating the activity to a sheltered area or undertaking an alternative, non-dusty activity until more suitable conditions return; and/or</li> <li>– temporary cessation of work within an area or a particular activity when it is identified to be a likely contributor to elevated dust measurements, until more favourable conditions return.</li> </ul> </li> <li>• Operations would be shutdown as required in accordance with Conditions O3.4 to O3.9 of EPL 20850 (Section 6.2).</li> </ul>

### 9.3 PREDICTIVE MODELLING

MACH Energy will operate two predictive models which will be used in conjunction with the real-time response protocols (Section 9.4) as part of the comprehensive air quality management system at the MPO:

- predictive meteorological forecasting – to predict the presence of favourable or unfavourable conditions based on meteorological data; and
- predictive air quality forecasting – to identify the potential for increased dust levels at nearby receivers based on meteorological conditions, operating locations and equipment information.

The system will assist operators to manage emissions and mitigate potential impacts from the MPO and aims to provide a framework for dealing with cumulative impacts in the local air-shed in cooperation with adjacent mines (in accordance with Condition 22, Schedule 3 of Development Consent DA 92/97).

The predictive air quality forecasting system will use predicted meteorological data and exposed operational areas to predict the risk of dust dispersion as a result of operations at the MPO.

The predictive air quality forecasting system will be primarily used to plan activities for the day and as an alert of possible elevated dust levels due to the operations, allowing MACH Energy to temporarily modify proposed operations, where relevant, to minimise the risk of elevated dust dispersion.

The predictive meteorological and air quality forecasting systems will be available at any time to environmental employees and shift supervisors. The latest available forecasts will be reviewed at the start of each shift and reported to the shift supervisor. The data will also be reviewed each morning (weekdays only) by the Environmental Superintendent (or delegate).

#### **9.4 REAL-TIME RESPONSE PROTOCOLS**

Whilst the predictive systems will be used to alert employees of the potential for elevated dust levels, allowing for preparation to reduce the magnitude of the predicted elevated levels, real-time air quality monitoring data will be used to identify when ambient levels of PM<sub>10</sub> are actually elevated. Real-time response triggers will be established and designed to provide a system to warn operational personnel (via email and/or SMS) of levels approaching a relevant criterion and to provide management/control actions. The dust alarm triggers and positions of real-time air quality monitoring locations will be reviewed annually (i.e. as mining progresses) or as part of a contingency response, if required.

EPL 20850 defines 'dust generating activities' as drilling, blasting, earthworks, construction activities, all hauling activities on unsealed haul roads, all overburden and coal extraction operations including loading and dumping activities and grader, loader, dozer and dragline operations. Operation of watercarts is permitted at all times. Activities within the Coal Handling and Preparation Plant (CHPP) and Materials Handling Area are not included as dust generating activities, provided all automated dust suppression spray systems at the ROM hopper, conveyor transfer points and product stockpiles are in use, at least one water cart is in use on the ROM stockpile and an adjustable hood is lowered onto rail wagons loadings.

The preliminary real-time response trigger levels are shown in Table 12. In the event that the real-time response trigger level is exceeded, email and/or SMS alarms will be directed to key staff/operational personnel. The adequacy of these alarms will be reviewed on an annual basis with any changes reported in the Annual Review and subsequent revisions of this AQMP. It is anticipated that changes will be required over time to reflect the relative positions of the mining, monitoring and receptor location as the mine progresses.

In the event that a real-time response trigger is exceeded, MACH Energy will implement the real-time response management actions listed in Table 13 (dependent upon the trigger level determined). The real-time response protocol is detailed in Figure 6.

In accordance with EPL 20850, at any time when there is no access to the meteorological or PM<sub>10</sub> monitoring data from the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitor and MACH Energy's A-PF2 monitor, all dust generating activities at the MPO will be temporarily ceased.

**Table 12**  
**Preliminary Real-time Response Trigger Levels**

Monitor	Rolling 1 hour Average Wind Direction	Rolling 24 hour Average PM <sub>10</sub> concentration		
		Green	Amber	Red
MW-NW <sup>a</sup>	Between 250 degrees (°) and 340° (inclusive) measured at MW-NW	≥38 µg/m <sup>3</sup>	≥41 µg/m <sup>3</sup>	≥44 µg/m <sup>3</sup>
A-PF2 <sup>b</sup>	Between 245° and 345° (inclusive) measured at A-PF2	≥38 µg/m <sup>3</sup>	≥41 µg/m <sup>3</sup>	≥44 µg/m <sup>3</sup>
A-PF2	Between 245° and 345° (inclusive) measured at A-PF2	≥40 µg/m <sup>3</sup>	≥44 µg/m <sup>3</sup>	≥50 µg/m <sup>3 c</sup>
A-PF4	Between 180° and 270° (inclusive) measured at A-PF4	≥40 µg/m <sup>3</sup>	≥45 µg/m <sup>3</sup>	≥50 µg/m <sup>3 c</sup>
A-PF5	Between 135° and 225° (inclusive) measured at A-PF4	≥40 µg/m <sup>3</sup>	≥45 µg/m <sup>3</sup>	≥50 µg/m <sup>3 c</sup>

Note: The rolling 1 hour average wind direction will be calculated in accordance with AS3580.14-2014.

<sup>a</sup> The Muswellbrook NW (MW-NW) monitor is a component of the Upper Hunter Air Quality Monitoring Network.

<sup>b</sup> A-PF2 is to be used if there is no access to the meteorological or PM<sub>10</sub> data from MW-NW.

<sup>c</sup> To be assessed for project-specific contribution.

\* Note alarms are not available from MW-NW.

**Table 13**  
**Real-time Response Management Measures**

Colour	Management/Control Action	Responsible
Green	<ul style="list-style-type: none"> <li>Review both actual and predicted weather conditions<sup>1</sup> to identify if adverse conditions are forecast or likely to occur for the rest of the shift.</li> <li>Review predicted air quality impacts<sup>1</sup> for the shift against measured levels.</li> <li>Confirm relevant dust control measures (refer Table 11) are in place and performing effectively.</li> <li>Prepare to make temporary operational changes to dust generating activities (e.g. relocate overburden dumping to wind protected locations; increase haul road watering rate; ensure operators using best endeavours to minimise dust lift off during loading; or selectively shutting down mobile fleet or diggers).</li> <li>Monitor any changes in weather conditions and PM<sub>10</sub> concentrations until PM<sub>10</sub> concentrations have dropped below the alarm trigger.</li> <li>Record management strategies each shift. This includes details of investigation, type of response (if any required), monitoring results and actions taken.</li> </ul>	Control Room Operator (or delegate)
Amber	<ul style="list-style-type: none"> <li>Review both actual and predicted weather conditions<sup>1</sup> to identify if adverse conditions are forecast or likely to occur for the rest of the shift.</li> <li>Review predicted air quality impacts<sup>1</sup> for the shift against measured levels.</li> <li>Confirm relevant dust control measures (refer Table 11) are in place and performing effectively.</li> <li>Make temporary operational changes to 'high priority' dust generating activities.                             <ul style="list-style-type: none"> <li>If amber alarm is triggered at MW-NW (or A-PF2 if MW-NW is not operational), make additional operational changes to dust generating activities as required, to prevent triggering a red alarm.</li> </ul> </li> <li>Monitor any changes in weather conditions and PM<sub>10</sub> concentrations and progressively reinstate equipment once PM<sub>10</sub> concentrations have dropped below the alarm trigger.</li> <li>Record management strategies each shift. This includes details of investigation, type of response (if any required), monitoring results and actions taken.</li> </ul>	Control Room Operator (or delegate)

**Table 13  
Real-time Response Management Measures (Continued)**

Colour	Management/Control Action	Responsible
Red	<p><b>If red alarm is triggered at MW-NW, or A-PF2 (when MW-NW is not operational only):</b></p> <ul style="list-style-type: none"> <li>• Cease all dust generating activities within one hour of red alarm being triggered.</li> <li>• Review both actual and predicted weather conditions<sup>1</sup> to identify if adverse conditions are forecast or likely to occur for the rest of the shift.</li> <li>• Review predicted air quality impacts<sup>1</sup> for the shift against measured levels (including any trends in the measured levels).</li> <li>• Confirm relevant dust control measures (refer Table 11) are in place and performing effectively.</li> <li>• Monitor changes in weather conditions and PM<sub>10</sub> concentrations. When the red alarm has not been triggered for a minimum time period of one hour from the time that cessation of all dust generating activities was completed, progressively resume dust generating activities.</li> <li>• When progressively resuming dust generating activities, track the recorded levels to maintain dust levels below the trigger.</li> <li>• Record management strategies each shift. This includes details of investigation, type of response (if any required), monitoring results and actions taken.</li> </ul>	Control Room Operator (or delegate)
Red (cont.)	<p><b>If red alarm is triggered at A-PF4, A-PF5 or A-PF2 (when MW-NW is operational):</b></p> <ul style="list-style-type: none"> <li>• Review both actual and predicted weather conditions<sup>1</sup> to identify if adverse conditions are forecast or likely to occur for the rest of the shift.</li> <li>• Review predicted air quality impacts<sup>1</sup> for the shift against measured levels (including any trends in the measured levels).</li> <li>• Make further temporary operational changes to 'high priority' and then 'lower priority' dust generating activities.</li> <li>• Confirm relevant dust control measures (refer Table 11) are in place and performing effectively.</li> <li>• Monitor changes in weather conditions and PM<sub>10</sub> concentrations and progressively reinstate equipment once the alarm is no longer triggered.</li> <li>• When progressively reinstating equipment, track the recorded levels to maintain dust levels below the trigger.</li> <li>• Record management strategies each shift. This includes details of investigation, type of response (if any required), monitoring results and actions taken.</li> </ul>	Control Room Operator (or delegate)

Notes:

<sup>1</sup> Predictive meteorological/air quality level forecasting as described in Section 9.3.

## 9.5 ODOUR AND FUME MANAGEMENT AND CONTROL MEASURES

In accordance with Condition 18, Schedule 3 of Development Consent DA 92/97, MACH Energy will ensure no offensive odours will be emitted from the site, as defined under the *Protection of the Environment Operations Act, 1997*, unless otherwise authorised by an EPL. No offensive odours are authorised by EPL 20850, as per Condition L4.1.

The primary potential odour and fume sources at the MPO are from spontaneous combustion and from blasting. Secondary sources include potential odour emissions from hydrocarbons and effluent discharge areas.

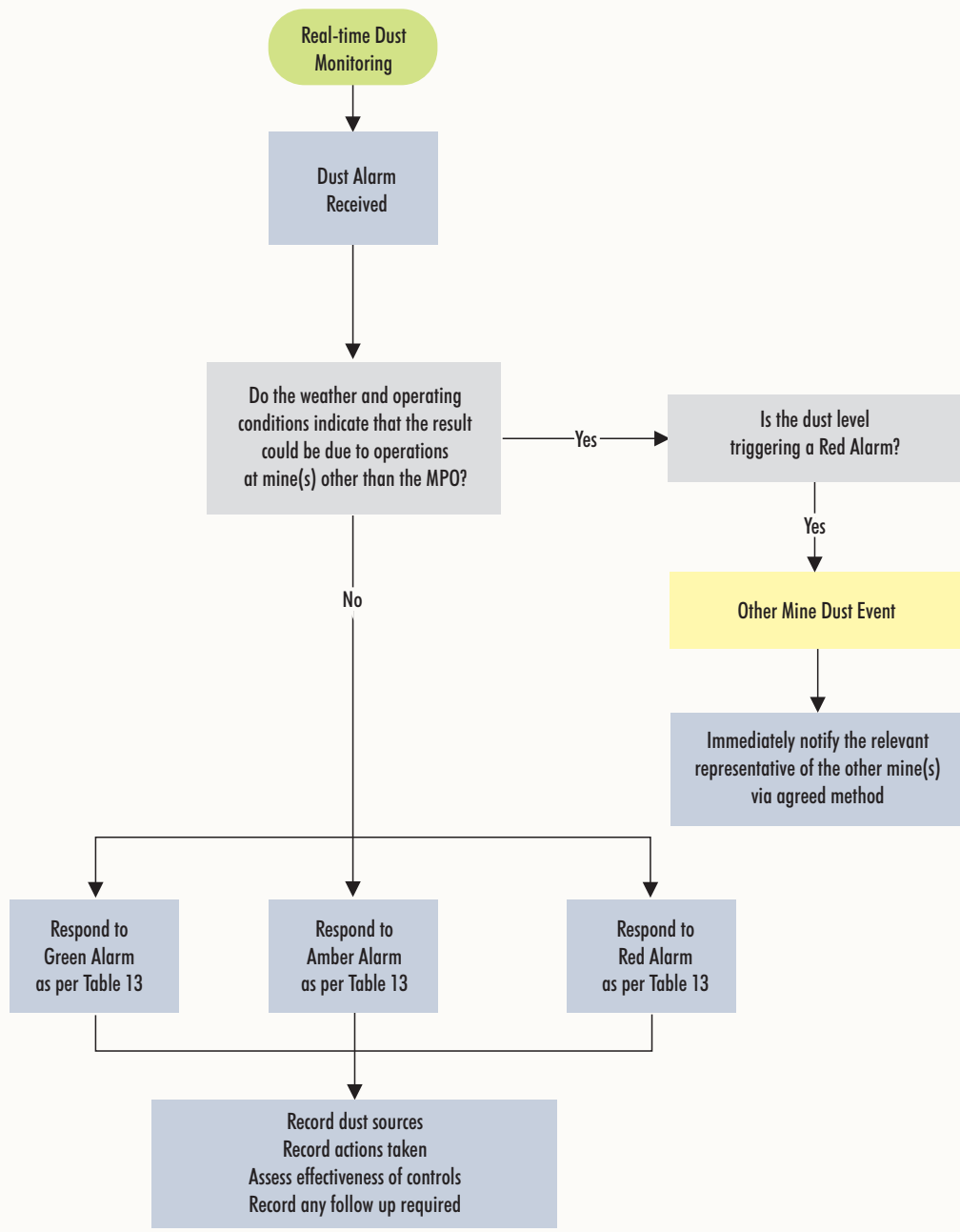


Figure 6



Preventative measures to manage the risk of spontaneous combustion in coal stockpiles and in the pit at the MPO, are focused on effective stockpile management. Regular surveys (using visual and other techniques such as infra-red screening) will be conducted to minimise the risk of spontaneous combustion events.

Once the CHPP has been commissioned, select ROM coal (e.g. ROM coal that has been identified as having a higher propensity for spontaneous combustion, or has been stockpiled for a designated period of time) would be preferentially processed to reduce the risk of spontaneous combustion.

Condition 15(a), Schedule 3 of Development Consent DA 92/97 requires MACH Energy to minimise the dust and fume emissions from blasting on-site. Details on blast management at the MPO will be described in the Blast Management Plan, including measures applied to minimise odour and blast fume.

MACH Energy will also manage its hydrocarbon stores and effluent discharge to minimise the potential for offsite emissions of offensive odour (as defined under the POEO Act). The primary controls for these secondary odour sources include separation from sensitive receptors and efficient operation and maintenance of potential odour generating facilities.

## **9.6 GREENHOUSE GAS EMISSIONS**

In accordance with Condition 19, Schedule 3 of Development Consent DA 92/97, MACH Energy will implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.

The primary source of greenhouse gas emissions at the MPO is the release of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) during the combustion of diesel fuel. Fugitive emissions of CO<sub>2</sub> and CH<sub>4</sub> from the coal seam and CO<sub>2</sub> released during the use of explosives will be minor in comparison to diesel combustion emissions.

Greenhouse gas emissions at the MPO will be minimised through the efficient use of diesel fuel by the mobile fleet. Efficient diesel use is promoted by:

- Optimising the design of haul roads to minimise the distance travelled between the pit and the CHPP.
- Minimising the re-handling of material (i.e. coal, overburden and topsoil).
- Maintaining the fleet in good operating order.

Greenhouse gas emissions from the MPO will be tracked and reported each year in the Annual Review, which will be prepared in accordance with Condition 3, Schedule 5 of Development Consent DA 92/97, and through the National Greenhouse and Energy Reporting Scheme.

## **9.7 AT-RECEIVER CONTROL**

In accordance with Condition 2, Schedule 3 of Development Consent DA 92/97, upon receiving a written request from the owner of any residence on the land listed in Table 9 and Table 10, MACH Energy will implement additional reasonable and feasible mitigation measures (such as insulation, air filters, first flush roof water drainage system and/or air conditioning) at the residence in consultation with the landowner.

## 9.8 CUMULATIVE AIR QUALITY MANAGEMENT

Condition 22(f), Schedule 3 of Development Consent DA 92/97 states:

22. *The Applicant must:*

...

(f) *co-ordinate the air quality management on site with the air quality management at nearby mines (including the Bengalla mine) to minimise cumulative air quality impacts from the mines, to the satisfaction of the Secretary.*

In regard to this AQMP, Condition 23(d), Schedule 3 of Development Consent DA 92/97 also states:

23. *The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Secretary. This plan must:*

...

(d) *include a protocol that has been prepared in consultation with the owners of the nearby mines to minimise the cumulative air quality impacts of the mines.*

The following mines have been identified nearby the MPO (Figure 1) and have been consulted with respect to cumulative air quality management:

- Bengalla Mine (immediately south);
- Mt Arthur Coal Mine (further south);
- Dartbrook Mine (immediately north);
- Mangoola Coal (south-west); and
- Muswellbrook Coal Mine (east).

An overall Master Cooperation Agreement has been developed between MACH Energy and the Bengalla Mine.

The cumulative air quality management protocol prepared in consultation with the above mines is described in Section 9.8.1.

### 9.8.1 Cumulative Air Quality Management Protocol

In the event that real-time monitoring identifies an ‘Other Mine Dust Event’, the Environmental Superintendent (or delegate) will (subject to agreement by the other mine) immediately notify the nominated representative of the relevant other mine(s). A representative of another mine will only be contacted once per shift (i.e. day shift, night shift).

An ‘Other Mine Dust Event’ is defined for real-time monitoring as presented on Figure 6, whereby:

- a real-time monitoring “Red Alarm” is triggered; and
- review of the observed weather conditions and operating conditions indicates that the source of excessive dust is likely to be another mine.

## 10 AIR QUALITY MONITORING PROGRAM

To assess compliance with the relevant criteria, and to meet the monitoring requirements of EPL 20850, real-time and supplementary air quality monitoring will be conducted at various locations that are considered representative of residential receivers in the areas that may potentially be influenced by mining operations.

The MPO air quality monitoring system is summarised in Table 14 and Figure 5 and is described further in Section 10.1. Note that in the event a monitoring site ceases to provide reliable data (e.g. due to excessive uncontrollable contamination from other local activity such as wildlife), a new location may be established. The air quality monitoring system will be reviewed each year as part of the Annual Review (Section 12.1) and will be revised as necessary to reflect the progression of the mine. For example, when the mine progresses to the west, a real-time monitor will be relocated (or added) to the north-west of the MPO.

Meteorological monitoring will also be conducted as described in Section 10.2.

**Table 14**  
**Mount Pleasant Operation Air Quality Monitoring System**

Site ID	Location			Frequency	Parameter
	General Description	Easting	Northing		
D1	Dust deposition gauge (DDG) located to the north-east.	0298318	6432891	Monthly	Dust
D3	DDG located to the south-east, in Muswellbrook.	0301266	6427765	Monthly	Dust
D4	DDG located to the north-east, in Kayuga.	0299429	6434929	Monthly	Dust
D5	DDG located to the south-east.	0278731	6428705	Monthly	Dust
D6	DDG located to the east on Collins Lane.	0299481	6430544	Monthly	Dust
D7 <sup>1</sup>	DDG located to the south, near Bengalla Mine.	0295952	6429011	Monthly	Dust
D8	DDG located to the south-west.	0292936	6429345	Monthly	Dust
D9	DDG located approximately in the centre of the MPO.	0296283	6431155	Monthly	Dust
D10	DDG located to the north-east.	0299026	6433757	Monthly	Dust
D11	DDG located to the north.	0296226	6433026	Monthly	Dust
D12	DDG located to the north-west.	0294143	6434113	Monthly	Dust
D13	DDG located to the north.	0296702	6434933	Monthly	Dust
D14	DDG located to the south-west.	0293006	6430521	Monthly	Dust
A-HV2 <sup>2</sup>	High Volume Air Sampler (HVAS) located to the south-east.	0298731	6428705	24 hours every 6 days	TSP
A-HV4	HVAS located to the north-east.	0299026	6433757	24 hours every 6 days	TSP
A-HV5	HVAS located to the north.	0295811	6434714	24 hours every 6 days	TSP
A-PF2 <sup>2</sup>	Palas Fidas real-time monitor located to the south-east.	0298731	6428705	Continuous	TSP, PM <sub>10</sub> and PM <sub>2.5</sub>
A-PF4	Palas Fidas real-time monitor located to the north-east.	0299026	6433757	Continuous	TSP, PM <sub>10</sub> and PM <sub>2.5</sub>
A-PF5	Palas Fidas real-time monitor located to the north.	0295811	6434714	Continuous	TSP, PM <sub>10</sub> and PM <sub>2.5</sub>

Notes:

- 1 Site D7 is located in close proximity to the northern boundary of the Bengalla Mine main pit and is heavily influenced by Bengalla Mine operations. Additionally, there are no privately-owned receivers in the vicinity of the site. As such, this site will continue to be monitored but will not be used to assess compliance or to represent residential receivers in the area.
- 2 The locations of sites A-HV2 and A-PF2 were revised in Q1 2018 to transition from construction to operation.

## **10.1 AIR QUALITY MONITORING METHODS**

### **10.1.1 Dust Deposition**

Dust deposition will be monitored monthly at thirteen DDGs around the MPO (Figure 5 and Table 14). Deposited dust will 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*.

### **10.1.2 PM<sub>10</sub> – Real-time Monitoring**

PM<sub>10</sub> will be measured using a Palas Fidas or similar fine dust monitoring and ambient air measuring system at three locations around the MPO (Figure 5 and Table 14).

PM<sub>10</sub> will be assessed for the purpose of real-time environmental management, as far as practicable, as defined by Standards Australia AS/NZS 3580.9.8.2008: *Methods for sampling and analysis of ambient air – PM<sub>10</sub> continuous direct mass method using a tapered element oscillating microbalance analyser*.

Real-time PM<sub>10</sub> levels are also available from the Muswellbrook NW monitor (part of the Upper Hunter Air Quality Monitoring Network).

### **10.1.3 PM<sub>2.5</sub> – Real-time Monitoring**

PM<sub>2.5</sub> will be measured using Palas Fidas or similar monitoring systems at three locations around the MPO (Figure 5 and Table 14).

Real-time PM<sub>2.5</sub> levels are also available from the Muswellbrook monitor (part of the Upper Hunter Air Quality Monitoring Network) located at Bowman Park, Lorne Street, Muswellbrook, NSW.

### **10.1.4 Total Suspended Particulate**

TSP will principally be measured with three HVAS monitors (Figure 5 and Table 14). TSP will be assessed as defined by Standards Australia AS/NZS 3580.9.3:2015: *Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) - High volume sampler gravimetric method*.

TSP will also be measured using Palas Fidas monitoring systems at three locations around the MPO (Figure 5 and Table 14).

## **10.2 METEOROLOGICAL MONITORING**

Meteorological data will be collected by the Automatic Weather Station (AWS) and Weather Masts at the MPO (locations described in Table 15 and shown on Figure 5). Meteorological forecasting (Section 9.3) will be undertaken as part of the air quality management system.

**Table 15**  
**Location of Meteorological Monitoring**

Location				Frequency
Site ID	General Description	Easting	Northing	
M-WM1	Weather mast, located to the south-west	0291465	6427182	Continuous
M-WM2	Weather mast, located to the south-east	0299575	6428744	Continuous
M-WS4	AWS, located to the north-east	0299026	6433757	Continuous
M-WM5	Weather mast, located to the south-east	0295811	6434714	Continuous

### 10.3 DATA VALIDATION AND COMPLIANCE ASSESSMENT

Where monitoring indicates elevated readings above the prescribed criteria (Tables 6, 7 and 8), MACH Energy will initiate an assessment of the data to determine the validity of the elevated reading and whether an exceedance has occurred.

Data validation will be assessed according to the following escalating review and assessment process and will include consideration of prevailing meteorological conditions at the time, where relevant (note Level 2 and 3 validation assessment will be applied as necessary).

- Level 1: First pass data review and evaluation. For example using a plot of the last month's data on a trend line spanning at least 12 months (where the data is available) or similar other simple and effective means to identify potentially erroneous or outlier data (e.g. wind roses for meteorological data), or tables showing variability and deviation from the average. At this stage, it is also necessary to establish if an elevated reading has been influenced by one of the following factors:
  - Extreme events, such as:
    - bushfires;
    - prescribed burning;
    - dust storms;
    - fire incidents;
    - illegal activities; or
    - other activities agreed by the Secretary of the DP&E.
  - Reasonableness of data (e.g. is the equipment operating properly, providing reliable data and calibrated correctly?).
- Level 2: Where data is assessed to be potentially invalid, an analysis of the available data (e.g. field records, laboratory notes, calibrations etc.) shall be made by the Environmental Superintendent. This may require a site inspection of the monitoring equipment to determine it is not damaged, dirty, corroded or compromised by insects, spider webs etc. and thus that the data is valid.
- Level 3: Where anomalous or potentially invalid data is found and the issue is significant (e.g. may indicate an exceedance or equipment fault) and a Level 1 or 2 evaluation cannot determine the cause, engage a professional air quality expert to examine the issue.



In addition to this event driven validation process, a review of monitoring data will be undertaken quarterly for dust deposition, HVAS and Palas Fidas monitoring locations. Monitoring data reviews may be undertaken more frequently in the first 12 months of mining operations.

In the event that an exceedance of an air quality criterion is considered to have occurred, MACH Energy will implement the Contingency Plan (Section 11).

## 11 CONTINGENCY PLAN

In the event that an exceedance of an air quality criterion is considered to have occurred, as per the compliance assessment protocol in Section 10.3, MACH Energy will implement the following Contingency Plan:

- The Environmental Superintendent will report the incident in accordance with Section 13.
- MACH Energy will identify the appropriate course of action with respect to the identified impact(s), in consultation with technical specialists, DP&E and any other relevant agencies, as necessary. For example, contingency measures, such as, but not limited to, those described in Section 11.1.
- MACH Energy will, in the event there is a dispute over the proposed remedial course of action or if the actions conflict with current approvals, submit the appropriate course of action to the DP&E for approval.
- MACH Energy will implement the appropriate course of action to the satisfaction of the DP&E.

### 11.1 POTENTIAL CONTINGENCY MEASURES

Potential contingency measures will be reviewed during revisions of this AQMP. Key potential contingency measures to be implemented (following completion of the compliance assessment protocol as described in Section 10.3) may include the following:

- MACH Energy will notify (in writing) the affected landowners and tenants of the exceedance as soon as practicable and provide them with regular air quality monitoring results, until the results show that the MPO is complying with the air quality criteria.
- MACH Energy will, on request, implement reasonable and feasible at-receiver air quality controls in accordance with Condition 2, Schedule 3 of Development Consent DA 92/97, where a breach of the relevant criteria has occurred.
- MACH Energy will investigate further air quality controls, if monitoring results indicate this is required.
- MACH Energy will, on request, acquire air quality-affected properties in accordance with Condition 1, Schedule 3 of Development Consent DA 92/97, where a breach of the relevant criteria has occurred and, for relevant properties, acquisition is not reasonably achievable under a separate approval for the Bengalla Mine.

## **12 REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE**

### **12.1 ANNUAL REVIEW**

In accordance with Condition 3, Schedule 5 of Development Consent DA 92/97 MACH Energy will review and evaluate the environmental performance of the MPO by the end of March each year (for the preceding calendar year) or other such timing as agreed by the Secretary of the DPE.

In relation to air quality, the Annual Review will:

- include a comprehensive review of the monitoring results and complaints records relating to the MPO over the past year, which includes a comparison of these results to evaluate compliance against the:
  - relevant statutory requirements, limits or performance measures/criteria (refer Sections 4 and 6);
  - monitoring results of the previous years; and
  - relevant predictions in the EIS;
- identify any air quality related incident over the past year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the air quality monitoring data over the life of the MPO;
- identify any discrepancies between the predicted and actual air quality impacts of the MPO, and analyse the potential cause of any significant discrepancies; and
- describe what air quality related measures will be implemented over the next year to improve the environmental performance of the MPO.

The Annual Review will be made publicly available on the MACH Energy website in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97.

### **12.2 AIR QUALITY AND GREENHOUSE GAS MANAGEMENT PLAN REVISION**

In accordance with Condition 4, Schedule 5 of Development Consent DA 92/97, this AQMP will be reviewed, and if necessary revised (to the satisfaction of the Secretary of the DP&E), within three months of the submission of:

- an Annual Review (Condition 3, Schedule 5);
- an incident report (Condition 7, Schedule 5);
- an Independent Environmental Audit (Condition 9, Schedule 5); and/or
- any modification to the conditions of Development Consent DA 92/97.

Within 4 weeks of conducting any such review, the Secretary of the DP&E will be advised of the outcomes of the review and any revised documents submitted to the Secretary for approval.

In accordance with Condition 4A, Schedule 5 of Development Consent DA 92/97, MACH Energy may submit a revised AQMP for the approval of the Secretary at any time, and may also submit any revision to this AQMP required under Development Consent DA 92/97 on a staged basis.

If agreed with the Secretary of the DP&E, a revision to this AQMP required under Development Consent DA 92/97 may be prepared without undertaking consultation with all parties nominated under the relevant Condition of Development Consent DA 92/97.

This AQMP will be made publicly available on the MACH Energy website, in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97.

### **12.3 INDEPENDENT ENVIRONMENTAL AUDIT**

In accordance with Condition 9, Schedule 5 of Development Consent DA 92/97, an independent environmental audit of the MPO will be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary of the DP&E.

The independent environmental audit will assess the environmental performance of the MPO and review the adequacy of this AQMP. If necessary, appropriate measures or actions to improve the environmental performance of the MPO or this AQMP will be recommended.

### **13 REPORTING PROCEDURES**

In accordance with Condition 2, Schedule 5 of Development Consent DA 92/97, MACH Energy has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

These protocols are described in detail in the [MPO Environmental Management Strategy](#) (MACH Energy, 2018).

In accordance with Condition 8, Schedule 5 of Development Consent DA 92/97, MACH Energy will provide regular reporting on the environmental performance of the MPO on the MACH Energy website.



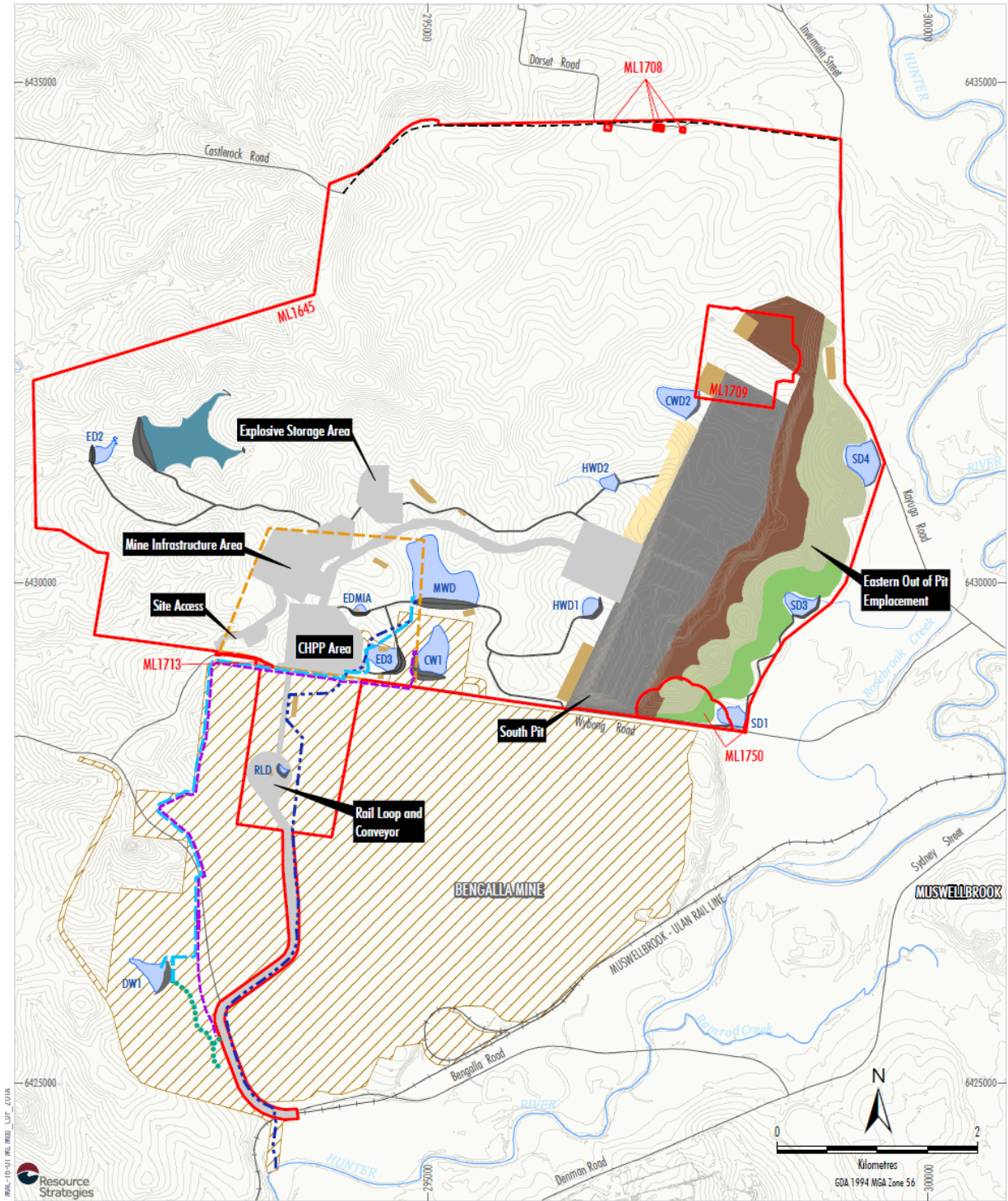
## 14 REFERENCES

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- New South Wales Minerals Council (2000) *Technical Paper – Particulate Matter and Mining Interim Report*.

**ATTACHMENT 1**

**APPENDIX 2 OF DEVELOPMENT CONSENT DA 92/97**

**APPENDIX 2**  
**FIGURE 1 - CONCEPTUAL PROJECT LAYOUT PLAN AT 2021**



- |  |  |
|--|--|
| Mining Lease Boundary                                  | Indicative Water Pipeline Alignment    |
| Bengalla Mine Approved Disturbance Boundary (SSD-5170) | MPO Hunter River Supply Pipeline       |
| Infrastructure Area Envelope                           | MPO DW1 Pipeline (Bi-directional)      |
| Active Stripping Area                                  | Bengalla Mine CW1 Pipeline             |
| Active Mining Area                                     | Approximate Extent of Scour Protection |
| Active Overburden Emplacement Area                     | Water Dam                              |
| Topsoil Stockpile                                      | Fines Emplacement Area                 |
| Initial Rehabilitation                                 |  |
| Established Rehabilitation                             |  |
| Infrastructure and Borrow/Stockpile Area               |  |
| Access Road  |  |
| Northern Link Road                                     |  |

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2017)

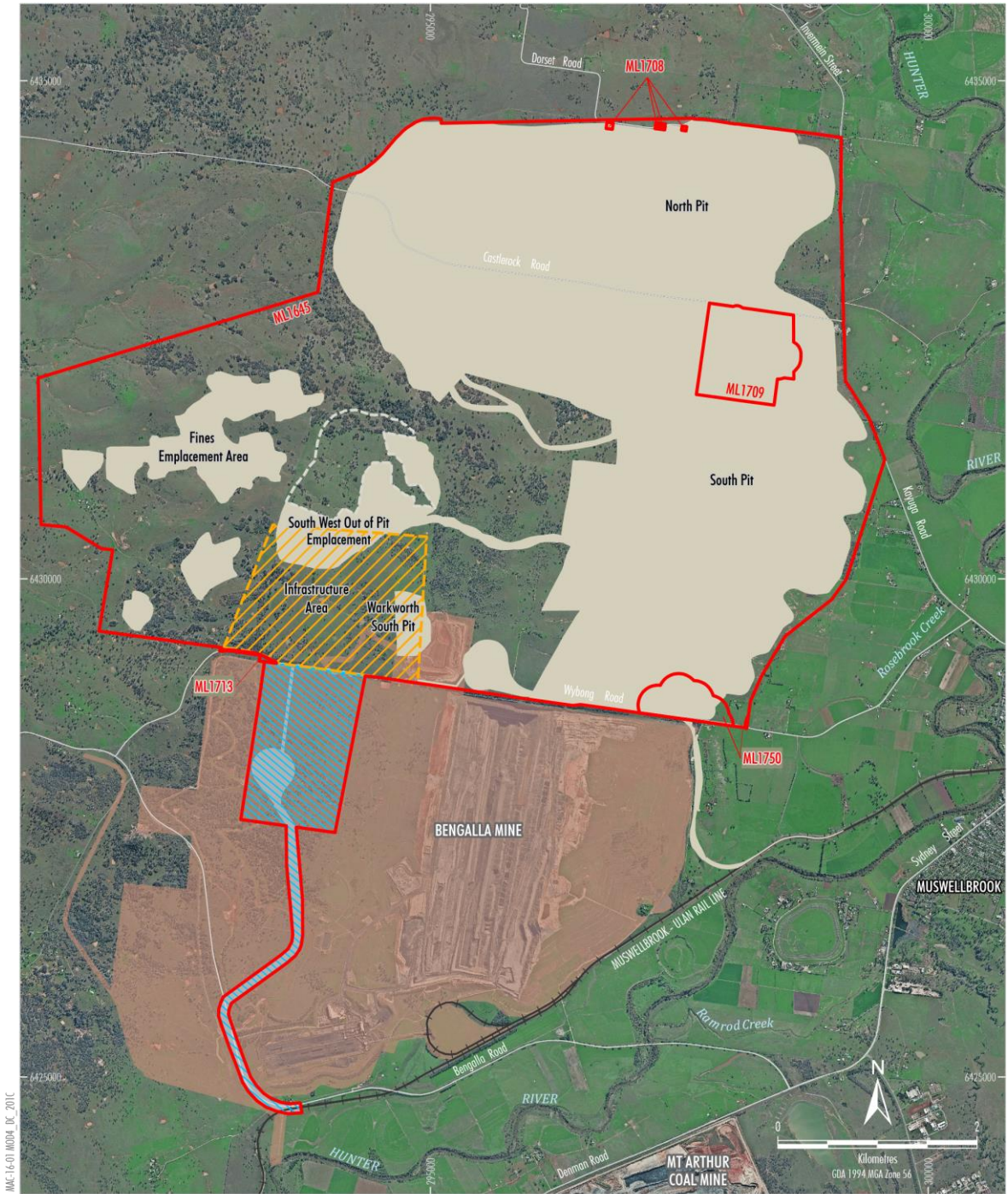
**MACHEnergy**  
MOUNT PLEASANT OPERATION







**FIGURE 3 - APPROVED SURFACE DISTURBANCE PLAN**



MAC-16-01 MOD4\_DC\_201C

- LEGEND**
- Mining Lease Boundary
  - Approximate Extent of Approved Surface Development <sup>1</sup>
  - Area Relinquished for Overburden Emplacement and Major Infrastructure
  - Infrastructure Area Envelope
  - Infrastructure to be removed under the Terms of Condition 37, Schedule 3
  - Indicative Existing Coal Transport Infrastructure
  - Bengalla Mine Approved Disturbance Boundary (SSD-5170)

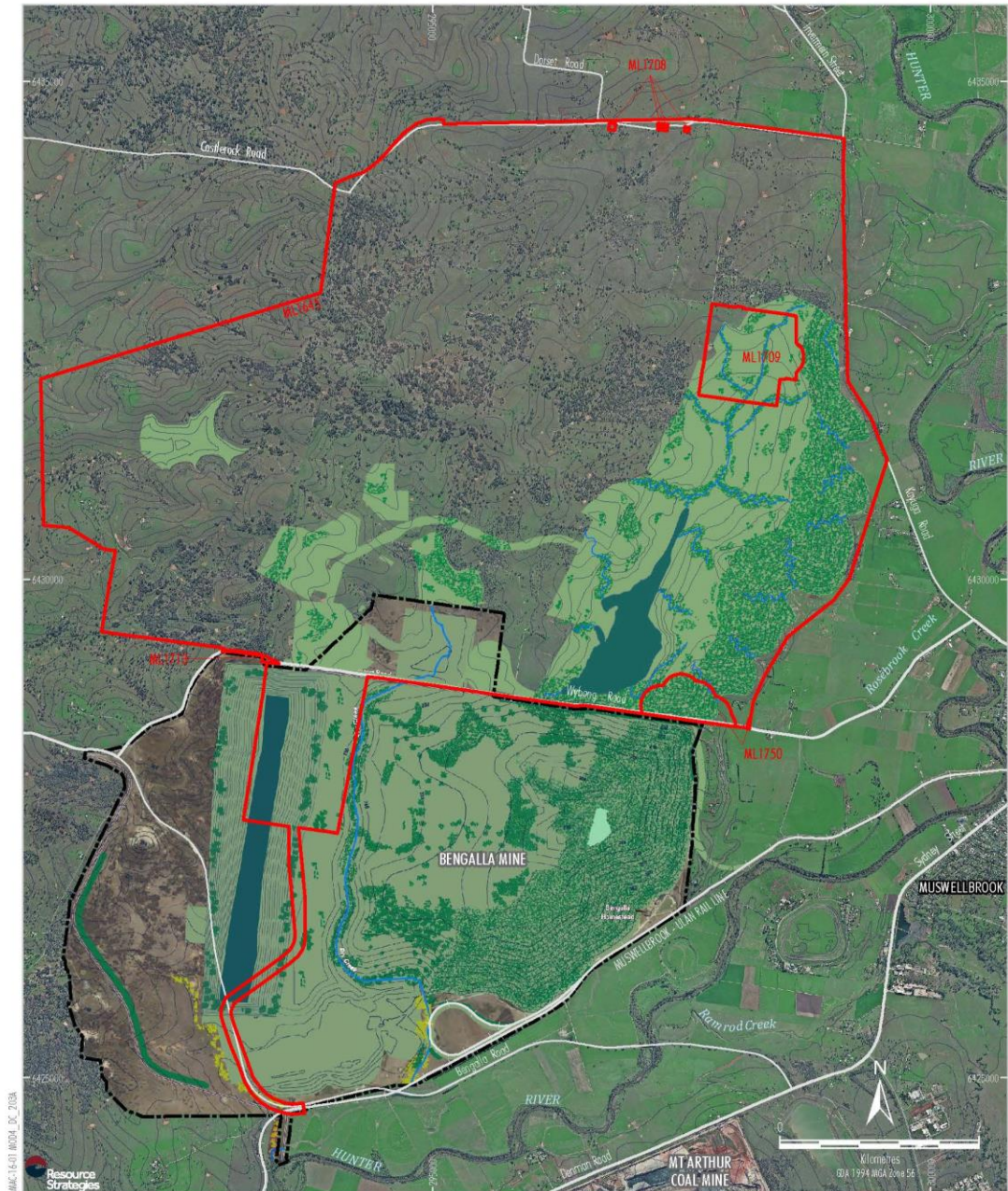
**NOTE**  
 1. Excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, signalling, other ancillary works and construction disturbance.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2018); Department of Planning and Environment (2016); MACH Energy (2017)  
 Orthophoto: MACH Energy (Aug 2016)

**MACHEnergy**  
 MOUNT PLEASANT OPERATION  
 Approved Surface Disturbance Plan



**FIGURE 4 - CONCEPTUAL FINAL LANDFORM**



- LEGEND**
- Mt Pleasant Mining Lease Boundary
  - Final Void
  - Final Rehabilitation
  - Bengalla Mine Conceptual Final Landform \*
  - Project Boundary (Appendix 2 of Development Consent SSD-5170) (Dated 23 December 2016)
  - Dry Creek
  - Final Void Lake
  - Rehabilitation
  - Rehabilitation Class III
  - Indicative Tree Screens (or equivalent)
  - Treed Rehabilitation
  - Indicative Restorative Area
- \* Digitised from Appendix 9 of Development Consent (SSD-5170) and amended in the Mount Pleasant Operation CHPP area.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); Department of Planning and Environment (2016); MACH Energy (2017)  
 Orthophoto: MACH Energy (Aug 2016)

**MACHEnergy**  
 MOUNT PLEASANT OPERATION  
 Conceptual Final Landform  
 (2026)

**APPENDIX A**

**AIR QUALITY AND GREENHOUSE GAS RELATED CONDITIONS  
DEVELOPMENT CONSENT DA 92/97**

**Table A1  
Air Quality and Greenhouse Gas Related Development Consent DA 92/97 Conditions**

Development Consent DA 92/97		AQMP Section								
<b>Schedule 3</b>										
<p><b>ACQUISITION UPON REQUEST</b></p> <p>1. If the Applicant receives a written request for acquisition from the owner of any land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 6-7 of Schedule 4.</p> <p><i>Table 1: Land subject to acquisition upon request</i></p> <table border="1"> <thead> <tr> <th><b>Basis</b></th> <th><b>Receiver</b></th> </tr> </thead> <tbody> <tr> <td>Noise</td> <td>23, 45, 47, 67, 96, 102, 108, 112, 118, 120, 120c, 121, 136, 143a, 143b, 143c, 143d, 143e, 147, 153a, 153b, 156a, 157a, 158, 159, 447, 448, 449</td> </tr> <tr> <td>Noise &amp; Air</td> <td>43, 43b</td> </tr> <tr> <td>Air</td> <td>20<sup>2</sup>, 21<sup>2</sup></td> </tr> </tbody> </table> <p><i>Notes:</i></p> <p>1 To identify the locations referred to in Table 1, see the figures in Appendix 5.</p> <p>2 The Applicant is only required to acquire and/or install mitigation measures at this property if acquisition and/or mitigation is not reasonably achievable under a separate approval for the Bengalla mine.</p>		<b>Basis</b>	<b>Receiver</b>	Noise	23, 45, 47, 67, 96, 102, 108, 112, 118, 120, 120c, 121, 136, 143a, 143b, 143c, 143d, 143e, 147, 153a, 153b, 156a, 157a, 158, 159, 447, 448, 449	Noise & Air	43, 43b	Air	20 <sup>2</sup> , 21 <sup>2</sup>	Section 6
<b>Basis</b>	<b>Receiver</b>									
Noise	23, 45, 47, 67, 96, 102, 108, 112, 118, 120, 120c, 121, 136, 143a, 143b, 143c, 143d, 143e, 147, 153a, 153b, 156a, 157a, 158, 159, 447, 448, 449									
Noise & Air	43, 43b									
Air	20 <sup>2</sup> , 21 <sup>2</sup>									
<p><b>ADDITIONAL MITIGATION UPON REQUEST</b></p> <p>2. Upon receiving a written request from the owner of any residence on any land listed in Table 1 (unless the owner of that land has requested acquisition) or Table 2, the Applicant must implement additional:</p> <p>(a) noise mitigation measures (such as double-glazing, insulation and/or air conditioning); and/or</p> <p>(b) air quality mitigation measures (such as air filters, a first flush roof water drainage system and/or air conditioning),</p> <p>as relevant at the residence(s) in consultation with the owner.</p> <p>These measures must be reasonable and feasible, and directed towards reducing the noise and/or air quality impacts of the development on the residence(s). The Applicant must also be responsible for the reasonable costs of ongoing maintenance of these additional mitigation measures until the cessation of mining operations.</p> <p>If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.</p> <p><i>Table 2: Land where additional mitigation measures are available on request</i></p> <table border="1"> <thead> <tr> <th><b>Basis</b></th> <th><b>Receiver</b></th> </tr> </thead> <tbody> <tr> <td>Noise</td> <td>19, 20, 21, 68, 74, 77, 79, 80a, 84a, 86a, 139, 140a, 140c, 154, 203, 207, 257, 258, 259, 526</td> </tr> </tbody> </table> <p><i>Note:</i></p> <p>1 To identify the locations referred to in Table 2, see the figures in Appendix 5.</p>		<b>Basis</b>	<b>Receiver</b>	Noise	19, 20, 21, 68, 74, 77, 79, 80a, 84a, 86a, 139, 140a, 140c, 154, 203, 207, 257, 258, 259, 526	Section 6				
<b>Basis</b>	<b>Receiver</b>									
Noise	19, 20, 21, 68, 74, 77, 79, 80a, 84a, 86a, 139, 140a, 140c, 154, 203, 207, 257, 258, 259, 526									
<p><b>AIR QUALITY &amp; GREENHOUSE GAS</b></p> <p><b>Odour</b></p> <p>18. The Applicant must ensure that no offensive odours are emitted from the site, as defined under the POEO Act, unless otherwise authorised by an EPL.</p>		Section 9.5								
<p><b>Greenhouse Gas Emissions</b></p> <p>19. The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.</p>		Section 9.6								
<p><b>Air Quality Criteria</b></p> <p>20. Except for the air quality-affected land referred to in Table 1, the Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not exceed the criteria listed in Tables 8, 9 or 10 at any residence on privately-owned land.</p>		Sections 6 and 9								

Development Consent DA 92/97				AQMP Section																																					
<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 colspan="2"><sup>d</sup> Criterion</th> </tr> </thead> <tbody> <tr> <td>Total suspended particulate (TSP) matter</td> <td>Annual</td> <td colspan="2"><sup>a</sup> 90 µg/m<sup>3</sup></td> </tr> <tr> <td>Particulate matter &lt; 10 µm (PM10)</td> <td>Annual</td> <td colspan="2"><sup>a</sup> 25 µg/m<sup>3</sup></td> </tr> <tr> <td>Particulate matter &lt; 2.5 µm (PM2.5)</td> <td>Annual</td> <td colspan="2"><sup>a</sup> 8 µg/m<sup>3</sup></td> </tr> </tbody> </table> <p><i>Table 9: Short term criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging Period</th> <th colspan="2"><sup>d</sup> Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter &lt; 10 µm (PM10)</td> <td>24 hour</td> <td colspan="2"><sup>b</sup> 50 µg/m<sup>3</sup></td> </tr> <tr> <td>Particulate matter &lt; 2.5 µm (PM2.5)</td> <td>24 hour</td> <td colspan="2"><sup>b</sup> 25 µg/m<sup>3</sup></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 total deposited dust level</th> </tr> </thead> <tbody> <tr> <td><sup>c</sup> Deposited dust</td> <td>Annual</td> <td><sup>b</sup> 2 g/m<sup>2</sup>/month</td> <td><sup>a</sup> 4 g/m<sup>2</sup>/month</td> </tr> </tbody> </table> <p>Notes to Tables 8-10:</p> <p><sup>a</sup> Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources);</p> <p><sup>b</sup> Incremental impact (i.e. incremental increase in concentrations due to the development on its own);</p> <p><sup>c</sup> 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</p> <p><sup>d</sup> Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.</p>					Pollutant	Averaging Period	<sup>d</sup> Criterion		Total suspended particulate (TSP) matter	Annual	<sup>a</sup> 90 µg/m <sup>3</sup>		Particulate matter < 10 µm (PM10)	Annual	<sup>a</sup> 25 µg/m <sup>3</sup>		Particulate matter < 2.5 µm (PM2.5)	Annual	<sup>a</sup> 8 µg/m <sup>3</sup>		Pollutant	Averaging Period	<sup>d</sup> Criterion		Particulate matter < 10 µm (PM10)	24 hour	<sup>b</sup> 50 µg/m <sup>3</sup>		Particulate matter < 2.5 µm (PM2.5)	24 hour	<sup>b</sup> 25 µg/m <sup>3</sup>		Pollutant	Averaging Period	Maximum increase in deposited dust level	Maximum total deposited dust level	<sup>c</sup> Deposited dust	Annual	<sup>b</sup> 2 g/m <sup>2</sup> /month	<sup>a</sup> 4 g/m <sup>2</sup> /month	
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21. Deleted				N/A																																					
<p><b>Operating Conditions</b></p> <p>22. The Applicant must:</p> <ul style="list-style-type: none"> <li>(a) implement best practice air quality management, including all reasonable and feasible measures to minimise the odour, fume and dust emissions of the development;</li> <li>(b) minimise visible air pollution generated by the development;</li> <li>(c) minimise, where reasonable and feasible, the extent of potential dust generating surfaces exposed on the site at any given point in time;</li> <li>(d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note d above under Tables 8-10);</li> <li>(e) 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</li> <li>(f) co-ordinate the air quality management on site with the air quality management at nearby mines (including the Bengalla Mine) to minimise cumulative air quality impacts from the mines,</li> </ul> <p>to the satisfaction of the Secretary.</p>				<p>Section 9</p> <p>Section 9.2</p> <p>Section 9.2</p> <p>Sections 9.3 and 9.4</p> <p>Sections 9.8 and 9.8.1</p>																																					
<p><b>Air Quality and Greenhouse Gas Management Plan</b></p> <p>23. The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> <li>(a) be submitted to the Secretary for approval prior to carrying out any development on site;</li> <li>(b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, including a real-time air quality management system that employs reactive and proactive mitigation measures;</li> <li>(c) include an air quality monitoring program that:</li> </ul>				<p>-</p> <p>Sections 7, 9, 10 and 11</p> <p>Section 10</p>																																					



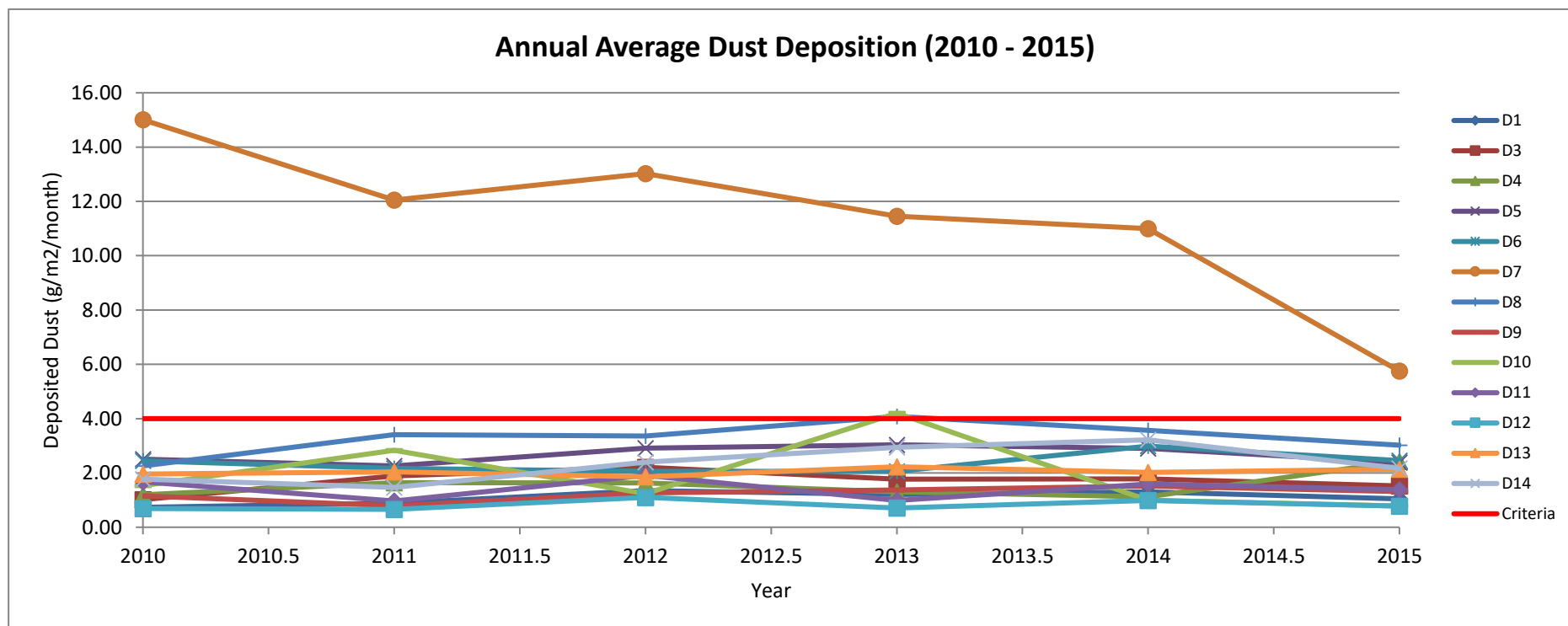
Development Consent DA 92/97	AQMP Section
<ul style="list-style-type: none"> <li>• uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development;</li> <li>• includes PM<sub>2.5</sub> monitoring (although this obligation could be satisfied by the regional air quality monitoring network if sufficient justification is provided);</li> <li>• includes a protocol for determining exceedances of the relevant conditions of this consent; and</li> </ul> <p>(d) include a protocol that has been prepared in consultation with the owners of nearby mines to minimise the cumulative air quality impacts of the mines.</p> <p>The Applicant must implement the management plan as approved by the Secretary.</p>	<p>Section 10.1</p> <p>Section 10.1.4</p> <p>Section 10.3</p> <p>Section 9.8</p>
<p><b>METEOROLOGICAL MONITORING</b></p> <p>24. For the life of the development, the Applicant must ensure that there is a meteorological station operating in the vicinity of the site that:</p> <p>(a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in NSW guideline; and</p> <p>(b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy, or as otherwise approved by the Secretary.</p>	<p>Section 10.2</p> <p>Section 10.2</p>
<p><b>Schedule 5</b></p>	
<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) detailed baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> <li>• the relevant statutory requirements (including any relevant consent, licence or lease conditions);</li> <li>• any relevant limits or performance measures/criteria;</li> <li>• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</li> </ul> <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"> <li>• impacts and environmental performance of the development;</li> <li>• effectiveness of any management measures (see c above);</li> </ul> <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 development over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> <li>• incidents;</li> <li>• complaints;</li> <li>• non-compliances with statutory requirements; and</li> <li>• exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul> <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 5</p> <p>Section 4</p> <p>Section 6</p> <p>Section 7</p> <p>Sections 7, 8, 9 and 10</p> <p>Section 11</p> <p>Section 10</p> <p>Section 11</p> <p>Section 12</p> <p>Section 12.1</p> <p>Section 12.2</p> <p>Section 12.3</p> <p>Section 12.3</p> <p>Section 11.2</p>

**APPENDIX B**  
**DUST DEPOSITION MONITORING RESULTS (2010– 2015)**



Annual Average Dust Deposition (g/m <sup>2</sup> /month)														
Year	Dust Deposition Gauge													Criteria
	D1	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	
2010	0.73	1.02	1.19	2.51	2.44	15.01	2.26	1.16	1.53	1.67	0.69	1.96	1.78	4.0
2011	0.88	1.89	1.64	2.26	2.17	12.05	3.41	0.79	2.83	0.97	0.66	2.04	1.47	4.0
2012	1.35	2.21	1.64	2.91	2.06	13.03	3.36	1.27	1.23	1.91	1.10	1.86	2.40	4.0
2013	1.21	1.78	1.31	3.04	2.06	11.46	4.08	1.38	4.20	0.99	0.71	2.23	2.95	4.0
2014	1.30	1.78	1.12	2.90	2.99	11.00	3.57	1.52	1.00	1.59	0.98	2.01	3.22	4.0
2015	1.05	1.53	2.43	2.38	2.46	5.75	3.02	1.32	0.78	1.38	0.78	2.13	2.17	4.0
<b>Average</b>	<b>1.1</b>	<b>1.7</b>	<b>1.6</b>	<b>2.7</b>	<b>2.4</b>	<b>11.4</b>	<b>3.3</b>	<b>1.2</b>	<b>1.9</b>	<b>1.4</b>	<b>0.8</b>	<b>2.0</b>	<b>2.3</b>	4.0

Note: Red cells indicate values greater than the long term dust deposition criteria (for all sources) of 4 grams per square metre per month.



**APPENDIX C**  
**RELEVANT SENSITIVE RECEPTOR LOCATIONS**

**Table C1**  
**Relevant Sensitive Receptor Locations**

ID	Landholders	Structure Type	Easting (m)	Northing (m)
4	JR SCRIVEN	Dwelling	299202	6425195
6	MUSWELLBROOK RACE CLUB LTD	Commercial	298605	6426135
19	DP ENGLEBRECHT	Dwelling	299120	6426779
20	KB & JA BARNETT	Dwelling	298866	6426826
21	MJ MCGOLDRICK	Dwelling	298804	6426823
23	JABETIN PTY LTD	Dwelling	299047	6427361
35	C HORNE	Dwelling	299980	6428580
35b	C HORNE	Dwelling	299986	6428649
43	JB MOORE	Dwelling	292318	6429012
43b	JB MOORE	Dwelling	291384	6428700
45	BA & TE STRACHAN	Dwelling	291263	6428277
47	BL & ML BATES	Dwelling	291276	6429615
67	JM SIMPSON	Dwelling	299896	6429202
68	RK & NV GOOGE	Dwelling	299976	6429057
74	N & M SORMAZ	Dwelling	300003	6429277
77	DM PURSER	Dwelling	300332	6429501
79	DW ADNUM	Dwelling	300572	6429448
80a	WJ ADNUM	Dwelling	300556	6429470
82	CK BIRCH	Dwelling	301020	6429170
83	LG & CM KELMAN	Dwelling	300956	6429298
83b	LG & CM KELMAN	Commercial	300909	6429329
84a	GE PITMAN	Dwelling	300800	6429358
84b	GE PITMAN	Dwelling	291180	6437472
86a	COWTIME INVESTMENTS PTY LTD	Dwelling	300342	6429734
86b	COWTIME INVESTMENTS PTY LTD	Dwelling	301865	6431879
96	RP GRAY	Dwelling	299879	6430321
102	AJPS MATHER	Dwelling	299829	6430440
108	JS GIBSON	Dwelling	299715	6430470
112	BD BARRY	Dwelling	299566	6430447
118	JM & CA HAYES	Dwelling	299655	6430627
120	DL & PA MOORE	Dwelling	299721	6430731
308	DL & PA MOORE	Commercial	299667	6430746
120c	DL & PA MOORE	Dwelling	299698	6430741
121	C & JM MOORE	Dwelling	299656	6430778
136	DG YORE	Dwelling	300336	6432453
139	RW & LP UPTON	Dwelling	300659	6432952
140a	DAPKOS PTY LTD	Dwelling	300978	6433030
205	DAPKOS PTY LTD	Commercial	301126	6431439
140c	DAPKOS PTY LTD	Dwelling	301236	6431474
143a	JS & NM LONERGAN	Dwelling	299928	6434457
143b	JS & NM LONERGAN	Dwelling	299209	6435244
147	MJ & RG ADNUM	Dwelling	299165.34	6434674
153a	GM CASEY	Dwelling	295898	6435444
154	PD & F STANDING	Dwelling	298537	6435520
156a	JE & JL LONERGAN	Dwelling	298882	6435173
156b	JE & JL LONERGAN	Dwelling	289455	6428815
157a	RB PARKINSON	Dwelling	298965	6434977

ID	Landholders	Structure Type	Easting (m)	Northing (m)
157b	RB PARKINSON	Dwelling	289024	6427910
158	JM HOATH	Dwelling	299063.22	6435063
159	JE & MS DUCEY	Dwelling	299127	6435011
169	L GREENSILL and J WATTUS	Dwelling	298868	6436638
171	L GREENSILL and J WATTUS	Dwelling	299038	6436955
172	RL & CE THOMPSON	Dwelling	299157	6437224
310	RL & CE THOMPSON	Dwelling	299130	6437280
173	TL KING and JA WARD	Dwelling	298878	6437773
174	TJ & ML POWER	Dwelling	298908	6437676
175	TJ & ML POWER	Dwelling	298928	6437622
176	JAF & LA ALLAN	Dwelling	298988	6437509
177	FW & HM & SA WHEATLEY	Dwelling	298731	6438046
178	PA NEELY	Dwelling	299347	6438053
179	FW WHEATLEY	Dwelling	299191	6438159
180	F.A. WHEATLEY & SON PTY LTD	Dwelling	299230	6438233
180b	F.A. WHEATLEY & SON PTY LTD	Dwelling	299562	6438055
180c	F.A. WHEATLEY & SON PTY LTD	Dwelling	299444	6438872
181	K.L. & H.R. DAY PTY LTD	Dwelling	300474	6437756
183	K.L. & H.R. DAY PTY LTD	Commercial	300857	6437446
181c	K.L. & H.R. DAY PTY LTD	Dwelling	300023	6437409
182	JG & AJ SADLER	Dwelling	300849	6437839
182b	JG & AJ SADLER	Dwelling	300843	6437724
189	OB O'BRIEN	Dwelling	301236	6434698
190	OB O'BRIEN	Dwelling	301113	6434682
191	JA & JE FIBBINS	Dwelling	301421	6434533
192	IG & CW INGLE	Dwelling	301290	6434531
193	GM & KL SMITH	Dwelling	301529	6434365
311	GM & KL SMITH	Dwelling	301388	6434419
193c	GM & KL SMITH	Dwelling	302406	6433964
194	TC & JBA HARRIS	Dwelling	302021	6433456
195	T & RK YOUNG	Dwelling	302121	6432949
196	T & RK YOUNG	Dwelling	302234	6432240
197	T & RK YOUNG	Dwelling	302117	6432365
195d	T & RK YOUNG	Dwelling	302170	6432128
195e	T & RK YOUNG	Commercial	302034	6432899
198	TJ & NP GOLDRICK	Dwelling	301994	6431847
199	NA BURLING	Dwelling	302094	6431842
200	R EASTON	Dwelling	302258	6431847
202	DN RAPHAEL	Dwelling	301546	6431292
202b	DN RAPHAEL	Dwelling	301940	6431205
203	RF & MA MILLARD	Dwelling	301451	6431324
206	WJ HARDES	Dwelling	299806	6427069
207	SW & KL BARKLEY	Dwelling	299389	6426888
207b	SW & KL BARKLEY	Dwelling	299537	6426696
208	FK & WDG ALMOND and PW HUME	Commercial	299174	6426781
315	FK & WDG ALMOND and PW HUME	Commercial	299208	6426836
212	DR & CJ TUBB	Dwelling	299568	6426381
212b	DR & CJ TUBB	Dwelling	299544	6426341
212c	DR & CJ TUBB	Commercial	299539	6426270

ID	Landholders	Structure Type	Easting (m)	Northing (m)
213	ENGBRECHT RACING STABLES PTY LTD	Dwelling	299175	6426554
214	AL THOMSON-WEIR and RC WEIR	Dwelling	299183	6426574
215	WJ & CB MCINTOSH	Dwelling	299184	6426607
216	NJ KEEVERS	Dwelling	299187	6426634
217	RRA FARNSWORTH	Dwelling	299192	6426663
218	SY JOHNSON	Dwelling	299137	6426583
219	GL & KL ANDREWS	Dwelling	299139	6426600
220	RA BYRNES and MA MOLLER	Dwelling	299144	6426635
221	TD BARRON	Dwelling	299150	6426680
222	ML & EA SWEENEY	Dwelling	299154	6426716
223	MC & LJ DOBIE	Dwelling	299125	6426722
224	DL ROBINSON	Dwelling	299097	6426732
225	MR CRANFIELD and JR GLEESON	Dwelling	299204	6426692
249	TW ROOTS	Dwelling	290948	6423468
252	RM & KF MERRICK	Dwelling	289457	6424899
252b	RM & KF MERRICK	Dwelling	289575	6424546
257	PG & CM LANE	Dwelling	291302	6426071
258a	NJ & RY ELLIS	Dwelling	291000	6426441
258b	NJ & RY ELLIS	Dwelling	290584	6426756
259	MR PEEL	Dwelling	290868	6426152
260	PSJ MURRAY	Dwelling	291002	6426002
261	PR ELLIS	Dwelling	290650	6425665
271	DE KILGANNON and DS MACDOUGALL	Dwelling	289009	6434418
272	GC SPARRE	Dwelling	290603	6433696
272b	GC SPARRE	Dwelling	290597	6433720
273	IJ & CM RICHARDS	Dwelling	289237	6435180
280	MONADELPHOUS PROPERTIES PTY LTD	Commercial	299773	6426105
281	JR & JA BUCKLEY	Commercial	299691	6426050
282	JE ANDERSON and KL & J CAMPBELL and MV & DJ & SE & TP HALLETT	Commercial	299620	6425915
283	SRP & RF RAY	Dwelling	299633	6425990
285	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	Commercial	300280	6427411
285b	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	Commercial	300172	6427476
285c	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	Commercial	300136	6427524
287	TELSTRA CORPORATION LTD	Commercial	300454	6427537
288	LA & JM WEBSTER	Dwelling	300479	6427545
288b	LA & JM WEBSTER	Dwelling	300493	6427559
289	RA & EA LAWMAN	Dwelling	300328	6428692
292	GR & MK WALSH	Dwelling	290611	6422527
298	MG & LJ LATHAM	Dwelling	291487	6421945
300	MG & LJ LATHAM	Dwelling	291365	6421702
296a	JM WILD	Dwelling	291746	6422103
296b	JM WILD	Dwelling	291623	6422133
302a	MJ & MJ DUNCAN	Dwelling	290914	6421267
302b	MJ & MJ DUNCAN	Dwelling	290695	6421456
302c	MJ & MJ DUNCAN	Dwelling	290718	6421463
305	RH ENGBRECHT	Commercial	299173	6426508
401	JL & DG DAY	Dwelling	289649	6437858

ID	Landholders	Structure Type	Easting (m)	Northing (m)
402	PC BRITTAN	Dwelling	290201	6438459
407	AD LONERGAN	Dwelling	291736	6437533
413a	MJH LUMBY	Dwelling	288634	6436895
413b	MJH LUMBY	Dwelling	288465	6437096
415	SJ FRANKLAND	Dwelling	288448	6436265
416	RV MITCHELL	Dwelling	287602	6434882
417	M & JA CASTELLANA	Dwelling	288300	6435593
418	PB WATTS	Dwelling	287814	6435336
419	KM BATES and TG WOODS	Dwelling	288703	6436630
421	GW RICHARDS	Dwelling	289314	6435713
422a	ME DANIELS	Dwelling	297505	6438903
422b	ME DANIELS	Dwelling	297482	6438920
434	GJ & RL JONES	Dwelling	299588	6438940
436	MEDEGATE PTY LTD	Dwelling	299863	6438778
437	BG & S CANVIN	Dwelling	299729	6438830
453a	SC & ME DEVER	Dwelling	288345	6434693
453b	SC & ME DEVER	Dwelling	288307	6434751
454	AP & PE MCMANUS	Dwelling	287912	6434470
456	GT KEAST	Dwelling	286641	6434111
458	HJ WRIGHT	Dwelling	288254	6433349
462a	SH JENNAR	Dwelling	286648	6429789
462b	SH JENNAR	Dwelling	286662	6429918
463	IV & CA INGOLD	Dwelling	286574	6429559
464	KL BALMER and JL SMITH	Dwelling	289097	6428232
465	FN & WL GOOGE	Dwelling	288366	6427931
466	GT MCNEILL	Dwelling	289103	6426847
467	MWJ & LC WALTON	Dwelling	290367	6427991
468a	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	Dwelling	288665	6422488
468b	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	Dwelling	288416	6422514
468c	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	Dwelling	288743	6422667
470	JI & PJ BROWN	Dwelling	289351	6423345
471	PJ BROWN	Dwelling	289165	6423423
472a	JDM MARKHAM	Dwelling	289360	6423043
472b	JDM MARKHAM	Dwelling	289390	6423191
474	AA & BT MEYER	Dwelling	289062	6422372
475	EJ & CA DENTON	Dwelling	290869	6421541
476	LA & CA MACPHERSON	Dwelling	289424	6420978
477a	MW TURNER	Dwelling	290064	6421064
477b	MW TURNER	Dwelling	290021	6421067
481	RL WILKS	Dwelling	288731	6420218
482	DJ PHILLIPS	Dwelling	288291	6420169
483	RW JONES	Dwelling	287961	6420256
484	TR & KM PAULSEN	Dwelling	288865	6419989
485a	PR & M BURGMANN	Dwelling	288070	6419004
485b	PR & M BURGMANN	Dwelling	288065	6419050
485c	PR & M BURGMANN	Dwelling	287991	6419081
485d	PR & M BURGMANN	Dwelling	287936	6419095
485e	PR & M BURGMANN	Dwelling	287940	6419101
487a	E RANKIN	Dwelling	292323	6421876



ID	Landholders	Structure Type	Easting (m)	Northing (m)
487b	E RANKIN	Dwelling	292203	6422343
488a	E & WJ RANKIN	Dwelling	292981	6421910
488b	E & WJ RANKIN	Dwelling	292667	6422644
526	DL Wicks	Dwelling	300537	6429477
527	DJ & GH CORK	Dwelling	300600	6428695
528	AS CHICK	Dwelling	300622	6428693
529	TH HAMILTON and AM SMITH	Dwelling	300641	6428693
530	SC & NJ BULLARD and JM HARRISON	Dwelling	300678	6428689
531	GJ & EA MUNZENBERGER	Dwelling	300678	6428670
532	VL ROSE	Dwelling	300677	6428649
533	MJ BROWN	Dwelling	300673	6428627
534	EE MARKS	Dwelling	300673	6428611
535	GL & DN HORTON	Dwelling	300665	6428593
536	LJ CUMMINS	Dwelling	300665	6428573
537	TJ D'HERVILLE	Dwelling	300664	6428556
538	KD POWER and T VERO	Dwelling	300511	6427651
539	PH CURTAIN and CA SINGLETON	Dwelling	300540	6427645
540	GRENTLL PTY LTD	Commercial	300569	6427621
541	JG HINDER and VG MATHEWS	Dwelling	300560	6427606
542	PE & GJ CHAPMAN	Dwelling	300550	6427597
543	KD CLOSE	Dwelling	300534	6427590
544	DS & RM NEWTON	Dwelling	300523	6427578
545	JA GREEN	Dwelling	300509	6427568
546	SJ SCOTT	Commercial	300302	6427587
547	LA & FK & G BRYANT	Dwelling	302122	6433354