

# RAVENSWORTH OPEN CUT

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GLENCORE



## Ravenstworth Complex Blast Management Plan

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# 1. Introduction

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## 1.1 Background

Ravensworth Operations Pty Limited (Ravensworth Complex) is a coal mining operation located between the townships of Muswellbrook and Singleton in the Upper Hunter Valley region of New South Wales (NSW). Ravensworth Complex is comprised of the Ravensworth Open Cut (ROC) and the Ravensworth Coal Handling and Preparation Plant (RCHPP) and is a wholly owned subsidiary of Glencore Coal Assets Australis Pty Ltd (GCAA) (refer to **Figure 1.1**).

Ravensworth Complex is managed in accordance with the Project Approval (PA09\_0176) (as modified) for the Ravensworth Operations Project (the Project), which was granted under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project consolidated a number of active and former open cut mines including Ravensworth West, Narama, Cumnock, Ravensworth South and Ravensworth No. 2. The Project also facilitated the expansion of open cut mining activities, including the new Ravensworth North mining area.

PA09\_0176 has provided for the integration of operational aspects of the mining operations in the area, allowing for a consistent and integrated approach to environmental management and mine planning (refer to **Section 1.2**). The Ravensworth Complex is committed to implementing continued mining operations in the context of updated and contemporary environmental management requirements.

The RCHPP incorporates a coal handling and preparation plant (CHPP) and coal terminal. The RCHPP is used to beneficiate and transport coal extracted from Ravensworth Open Cut (ROC) and Ravensworth Underground Mine (RUM).

ROC and RUM are collectively referred to as the Ravensworth Complex. RUM is managed under a separate development consent (DA 104/96) granted under the EP&A Act. RUM has been under care and maintenance since October 2014.

The Ravensworth Complex is shown in **Figure 1.2**. A number of company entities and joint venture partners are responsible for managing the operations, which are undertaken at the respective facilities that comprise the Ravensworth Complex. For the purpose of this management plan, these respective entities will collectively be referred to as the Ravensworth Complex, with all activities ultimately being undertaken by GCAA managed businesses.

Figure 1.1 – Locality Plan

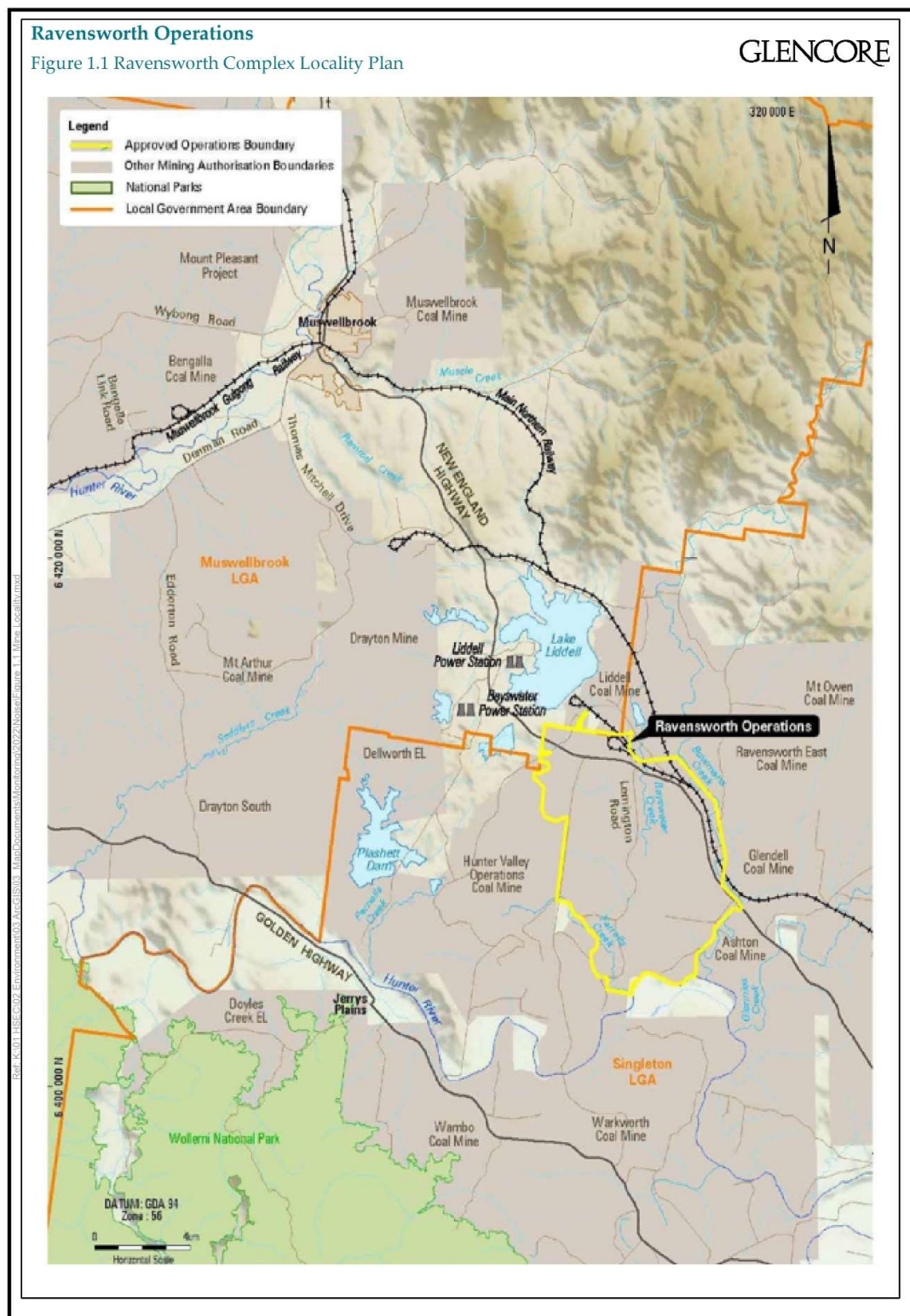
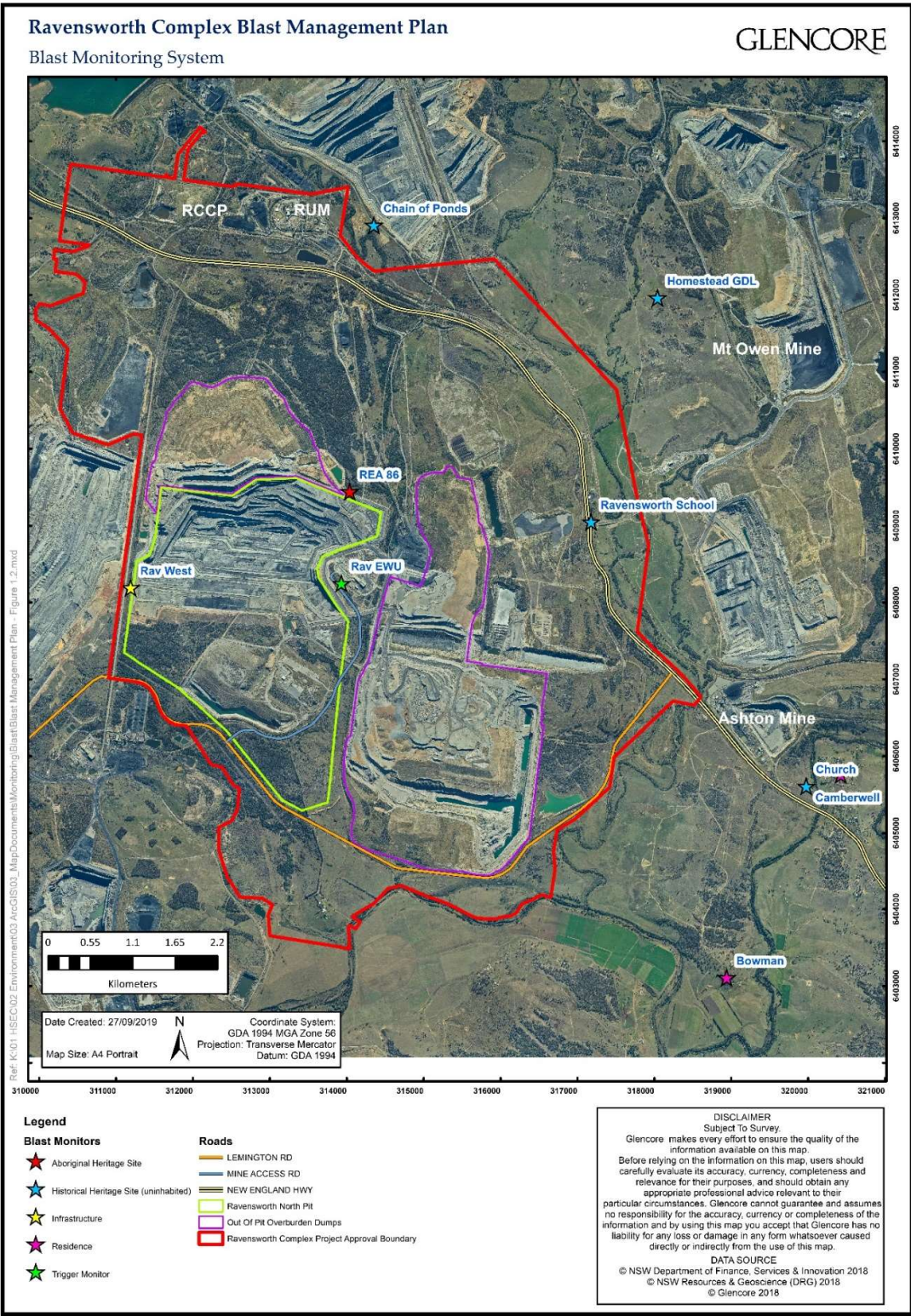




Figure 1.2 – Ravensworth Complex Blast Monitoring System



## 1.2 Purpose and Scope

The purpose of this Blast Management Plan (BMP) is to provide a description of the measures to be implemented by the Ravensworth Complex to manage blasting activities undertaken by Ravensworth Complex and to detail the blast requirements and obligations in PA09\_0176 and EPL2652. This BMP also provides a mechanism for monitoring and assessing blast monitoring results against the relevant blast impact assessment criteria from PA09\_0176.

The BMP has been prepared for the Ravensworth Complex, which includes the following mining operations and infrastructure:

- Development of a multi-seam open cut mining operation within an area west of Bayswater Creek, known as the Ravensworth North Pit which will encompass the existing Ravensworth West open cut mine;
- The current Narama Mine, Ravensworth North Mine, Ravensworth West Mine, Cumnock No. 1 open cut and the surface operations of RUM;
- Mine voids associated with the former Ravensworth South and Ravensworth No. 2 mines; and
- The RCHPP facility which is located adjacent to the RUM pit-top facility.

Blasting operations at Ravensworth Complex will be undertaken within the Ravensworth North Pit.

This BMP has also been prepared in consideration of GCAA's *11.12 Blast Management* protocol.

## 1.3 Objectives

The objectives of this BMP are to:

- Establish a blast monitoring system to assess the blast and vibration impact on surrounding receivers;
- Detail the blast management controls to be implemented to minimise blasting impacts from the site;
- Provide a blast management protocol to assess monitoring results against blast impact assessment criteria from PA09\_0176, to evaluate compliance;
- Manage blast related community complaints in a timely and effective manner; and
- Detail the procedure for reporting blast criteria exceedances and/or blast related incidents to relevant stakeholders.

## 1.4 Roles and Responsibilities

Relevant roles and responsibilities associated with this BMP are presented in **Table 1.1** below.

Table 1.1 - Roles and Responsibilities

| Role   | Responsibilities   |
|--|--|
| <b>Operations Manager</b>  | <ul style="list-style-type: none"> <li>• Provide adequate resources for the implementation of this BMP (this plan);</li> <li>• Authorise the implementation of specific management measures to minimise blast impacts in accordance with this plan;</li> <li>• Ensure the outcomes of monitoring are systematically evaluated as part of ongoing mine planning; and</li> <li>• Authorise internal and external reporting requirements as well as subsequent revisions of this BMP.</li> </ul>  |
| <b>Environment &amp; Community Manager (ECM)</b>                                       | <ul style="list-style-type: none"> <li>• Oversee the implementation of the BMP;</li> <li>• Coordinate blast monitoring in accordance with this BMP;</li> <li>• Confirm the results of monitoring are systematically evaluated and reported to relevant personnel for consideration as part of ongoing mine planning;</li> <li>• Notify regulatory authorities and affected landholders of any blasting related exceedance and undertake associated reporting;</li> <li>• Ensure all internal and external reporting requirements are met;</li> <li>• Ensure copies of the BMP are available on the Ravensworth Complex website;</li> <li>• Develop and maintain a protocol to minimise the potential for simultaneous blasting with other nearby mines; and</li> <li>• Coordinate periodic reviews of this BMP.</li> </ul> |
| <b>Environment and Community Coordinator (ECC) / Environment and Community Officer</b> | <ul style="list-style-type: none"> <li>• Assist the Drill and Blast Engineer with investigations of blasting exceedances, incidents or complaints;</li> <li>• Liaise with the Drill and Blast Engineer to coordinate the implementation and maintenance of the community hotline;</li> <li>• Coordinate the implementation of the BMP, including liaison with the Drill and Blast Technician to assess meteorological conditions prior to blasts;</li> <li>• Coordinate the management of records and reporting of blast monitoring results; and</li> <li>• Manage blasting related complaints in accordance with the complaints management procedure.</li> </ul>  |
| <b>Drill and Blast Engineer/Snr Drill and Blast Engineer</b>                           | <ul style="list-style-type: none"> <li>• Regularly review blast design parameters on the basis of blast monitoring records;</li> <li>• Design and undertake blasts to comply with the requirements of this BMP, including the identification of meteorological blasting exclusion windows;</li> <li>• Assess meteorological conditions prior to blasting to determine whether conditions are appropriate for blasting, in consultation with the ECC;</li> <li>• Confirm that the blast monitoring network is active prior to blasting;</li> <li>• Advise the ECC of the current blasting schedule, including changes to the schedule;</li> <li>• Maintain records for all blasts; and</li> <li>• Assist the ECC with investigations into blasting exceedances, incidents or complaints.</li> </ul>                         |
| <b>Drill and Blast Superintendent/ Supervisor</b>                                      | <ul style="list-style-type: none"> <li>• Ensure the drill pattern is drilled in accordance with the blast design; and</li> <li>• Ensure the blast is loaded with the correct quantity and quality of explosive and stemmed in accordance with the blast design.</li> </ul>   |
| <b>Shotfirers</b>  | <ul style="list-style-type: none"> <li>• Notify the Drill and Blast Engineer and Supervisor of any factors that may lead to non-compliance with this BMP; and</li> <li>• Load and fire blasts in accordance with the design supplied by the Drill and Blast Engineer.</li> </ul>   |
| <b>Drillers</b>  | <ul style="list-style-type: none"> <li>• Record drill status, including hole depths, pattern and relevant information.</li> </ul>  |



## 1.5 Definitions

The key terminology utilised within this BMP is defined in **Table 1.2** below.

*Table 1.2 – Terminology Utilised Within the BMP*

| Term                          | Definition  |
|-------------------------------|---|
| <b>Air blast/Overpressure</b> | An airborne shock wave resulting from detonation of explosives. An air blast may be caused by blasted material movement or the release of expanding gas into the air. |
| <b>Blasting</b>               | Any activity involving the use of explosives for the purpose of producing an explosion to fragment rock for mining.   |
| <b>Flyrock</b>                | Rock that is propelled outside of the blasting area through the air or along the ground as a result of the detonation of explosives.                                  |
| <b>Ground vibration</b>       | The movement of the ground caused by the blast wave emanating from the blast.   |
| <b>Particle Velocity</b>      | A measure of ground vibration. Particle velocity describes the velocity at which a particle of ground vibrates when excited by a seismic wave.                        |
| <b>PPV</b>                    | Peak particle velocity measured in mm/s.  |
| <b>dB (Lin Peak)</b>          | The peak sound pressure level expressed as decibels with no frequency weighting.  |

## 1.6 Regulatory Requirements

PA09\_0176 for the Ravensworth Complex was assessed under the EP&A Act. Project Approval for the Ravensworth Complex was gained from the Minister for Planning on 11 February 2011; with subsequent modifications approved in August 2013 (MOD 1), December 2014 (MOD 2) and February 2016 (MOD 3). The requirement for this BMP arises from Condition 17 of Schedule 3 of PA09\_0176.

A detailed list of PA09\_0176 blast conditions and the relevant Statement of Commitments and where they are addressed in this document, are included in **Section 2** and **Appendix A.1**.

An Environmental Management Strategy (EMS) has been prepared for Ravensworth Complex (in accordance with Schedule 5, Condition 1 of PA 09\_0176), which provides the strategic context for the environmental management of the operation.

## 2. Commitments

All blasting related commitments and conditions included in the PA 09\_0176 are provided in **Table 2.1** and **Appendix A1** respectively. All additional commitments outlined within this BMP are detailed in **Table 2.2**. Management commitments requiring actioning will be entered into the Ravensworth Compliance Management system (CMO) and actioned. Records of documentation associated with the management commitments will be maintained as outlined in **Section 7.5**.

*Table 2.1- Statement of Commitments*

| Commitment No. | Statement of Commitments Condition   | Relevant Section   |
|----------------|--|--|
| 6.6.10         | The Ravensworth Complex will establish relevant blast impact criteria for the protection of archaeological site REA 86, through an assessment by a suitably qualified geotechnical engineer, as part of the Aboriginal Cultural Heritage Management Plan for the Project, prepared in consultation with registered Aboriginal stakeholders and OEH and to the satisfaction of the Department.  | Table 4.4  |
| 6.6.11         | The Proponent will develop a blasting protocol in consultation with relevant service providers and infrastructure owners prior to the commencement of blasting within 500 m of the infrastructure specified in Table 6.2 and any relevant surface infrastructure at Macquarie Generation and ACOL. This may include revising blasting criteria from that indicated in the EA developed in consultation with the relevant service provider or infrastructure owner. | Section 5.2<br><i>Condition no longer triggered for Macquarie Generation</i> |
| 6.6.12         | The Proponent will continue its research into the effects of vibration on the 1000 ML dam wall in consultation with the DSC. This research may revise the appropriate vibration criteria for this structure, and will be documented as part of the Blast Management Plan for the Project.  | Section 4.2  |

*Table 2.2 Commitments within this Management Plan*

| Commitment No. | Management Plan Commitment  | Relevant Section |
|----------------|---|------------------|
| 1              | Ravensworth Complex will advise DPE in writing of any agreements reached with relevant service providers or surrounding mining operations regarding the revision of the criteria contained within <b>Tables 4.1 to 4.4</b> .                          | 4.2              |
| 2              | Blasting at the Ravensworth Complex will only occur on Monday to Saturday between 9.00 am and 5.00 pm. No blasting will be undertaken on Sundays, public holidays or at any other time, unless written approval is obtained from the Secretary of DPE | 5.1              |
| 3              | Blasting will be undertaken at a maximum of two blasts per day and no more than 10 blasts per week averaged over a 12 month period, for all blasts undertaken at the Ravensworth Complex  | 5.1              |
| 4              | Detailed design is undertaken for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration and air blast, the potential for flyrock and to ensure compliance with site specific blasting conditions               | 5.1              |

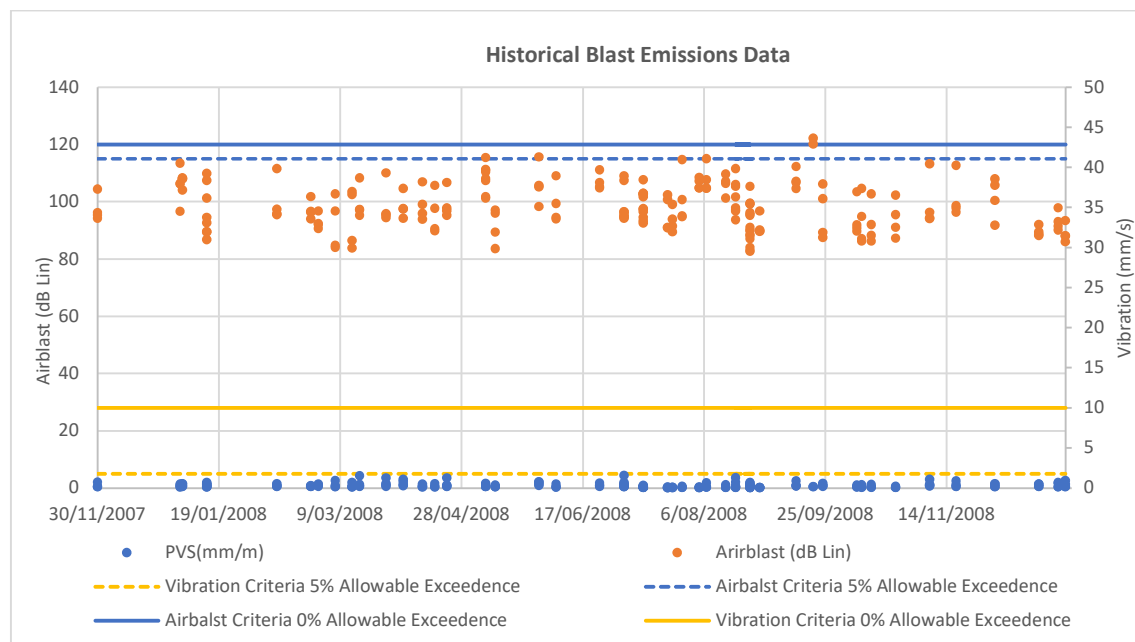
| Commitment No. | Management Plan Commitment  | Relevant Section    |
|----------------|---|---------------------|
| 5              | Blasting operations at the Ravensworth Complex will be undertaken in accordance with the blasting protocols that have been implemented between Ashton Coal Operations Limited (ACOL) and the Ravensworth Complex, as well as the protocol developed between Hunter Valley Operations (HVO) and the Ravensworth Complex          | 5.1                 |
| 6              | Blasts will be undertaken in accordance with the Ravensworth Complex's Pre-Blasting Assessment process  | 5.1 and 5.2         |
| 7              | Detailed monitoring of blasts over the life of the mine at relevant blast sensitive locations   | 5.1 and 6           |
| 8              | Training will be provided to all relevant personnel on environmental obligations in relation to blasting controls   | 5.1                 |
| 9              | Periodic review of blast management procedures to evaluate performance and identify corrective action, if required  | 5.1                 |
| 10             | The Ravensworth Complex will monitor blasts as mining progresses, in accordance with the existing blast monitoring system   | 6                   |
| 11             | Measurement of vibration resulting from mine blasts in the vicinity of REA 86, will be undertaken   | 5.1.2               |
| 12             | Data from these measurements will be analysed, and reviewed to confirm that blast vibration is in compliance with the blast criteria for REA 86   | 5.1.2 and Table 4.4 |
| 13             | A record of vibration levels will be maintained. Annual monitoring and photographic recording will be undertaken if required in a comparable manner to the baseline recording to assess vibration effects on the grooves.   | 5.1.1               |
| 14             | Where vibration exceedance is detected, appropriate steps will be taken in accordance with site procedure to amend blasting practice. The exceedance will be reported by letter to the appropriate stakeholders including DPE and Aboriginal groups.  | 5.1.1               |
| 15             | Monitoring of vibration levels experienced at REA 86 will be undertaken to ensure continuing compliance with the blast criteria, until blasting is one kilometre from the site  | 5.1.2               |
| 16             | To minimise the potential for blasting to occur simultaneously with neighbouring mines, communication is undertaken to notify of intended blast times.  | 5.2                 |
| 17             | Ravensworth Complex will report all exceedances to the relevant authorities   | 6.3                 |
| 18             | The Annual Review prepared each year for the Ravensworth Complex will include an assessment of the blast monitoring results against the blast impact assessment criteria and any trends over the period. In addition, any complaints relating to blasting undertaken at the Ravensworth Complex, and the response actions taken | 7.2.1               |
| 19             | A summary of blast monitoring results will also be presented to the Ravensworth Complex Community Consultative Committee (CCC) meetings   | 7.2                 |
| 20             | In accordance with the Environmental Management Strategy, the Ravensworth Complex ECM will maintain a centralised location to record communications details of relevant external stakeholders and procedures for stakeholder contact including a Complaints Procedure.  | 7.5                 |
| 21             | In the event that a complaint is received in relation to blast impacts from the operation, an investigation will be undertaken in accordance with the relevant GCAA reporting guideline.  | 7.3                 |

### 3. Baseline Data

As detailed within the Ravensworth Complex Environmental Assessment (EA) (Umwelt, 2010), a comprehensive blast impact assessment was undertaken for Ravensworth Complex. The EA completed an assessment of the potential vibration and airblast impacts from blasting associated with the Narama Extension Project.

Blast emissions monitoring data from November 2007 to January 2009 relevant to the Narama Mine operations was reviewed and analysed (**Figure 3.1**) by a blasting and vibration specialist for the EA. This data included measured vibration and airblast levels at a number of established blast monitoring locations as well as blast identification information, blast type, maximum instantaneous charge (MIC) and the distance from the blast to the respective monitoring locations. This data was, in turn, utilised to develop prediction site laws for ground vibration and airblast to form the basis of this assessment.

Figure 3.1 Historical Blast Emissions Data



Blast calculations in the EA were conducted in order to estimate the allowable MIC's for compliance with the vibration and airblast criteria (**Section 4.1**) at the nearest potentially affected vibration and airblast sensitive receivers including private residential locations, electricity transmission poles and the 1000ML Dam wall.

The approach of the blast impact assessment was to determine the limiting factors and the necessary operational controls (**Section 5.0**) for each blast design at Ravensworth Complex with the aim of achieving the relevant vibration and airblast criteria (**Section 4.1**) and to provide guidance for the future detailed design of blasting practices at Ravensworth Complex.

## 4. Blast Impact Assessment Criteria

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To promote uniform environmental standards, the Australian and New Zealand Environment and Conservation Council (ANZECC) developed the following guidelines *‘Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration’* (ANZECC 1990). The ANZECC guidelines are based on human comfort levels and are much more stringent than those based on the potential for damage to structures. The guidelines prescribe fundamental criteria that have been applied for private residences and other sensitive locations.

Blasting criteria applicable to mining operations at Ravensworth Complex are detailed in **Section 4.1** below (also refer to **Figure 1.2**). The PA09\_0176 nominates blasting criteria for:

- Privately owned residences and structures;
- Heritage structures (including Camberwell Church, Ravensworth Homestead);
- The Narama Dam and the proposed main storage dam;
- Electricity transmission lines;
- Conveyors;
- Railway line;
- Chain of Ponds Hotel;
- Ravensworth Public School; and
- Aboriginal Cultural Heritage Site REA86.

**Section 4.2** details the process to be undertaken by Ravensworth Complex if they seek to amend the impact assessment criteria detailed in **Section 4.1**.

### 4.1 Impact Assessment Criteria

PA09\_0176 specifies vibration criteria and overpressure criteria for a range of public and privately owned infrastructure (refer to **Tables 4.1 to 4.4**). These criteria were developed in accordance with relevant guidelines, in consultation with the relevant service providers and in consideration of precedents set by other sites and regulatory agencies.

In recognition of the potential impacts of blasting practices, Ravensworth Complex has committed to designing blasts so that predicted levels are within the vibration criteria outlined in the PA09\_0176 (refer to **Tables 4.1 to 4.4**).

#### 4.1.1 Non-Mine Owned Residences

PA09\_0176 requires compliance with Environment Protection Licence (EPL) 2652 (**Section 4.1.3**) at residences on privately owned land (refer to **Table 4.1**). The relevant limits for non-mine owned residences in relation to both vibration and air blast are included within **Table 4.1**. As noted within **Section 4**, the blasting impact assessment criteria have been developed in consideration of the EPA’s guidelines, which are based on the *ANZECC Guidelines for Blasting* (ANZECC 1990).



Table 4.1 Impact Assessment Criteria at Non-Mine Owned Residences

| Location                                 | Vibration Criteria | Air Blast Criterion (dB Linear Peak) | Allowable Exceedance Vibration (mm/s)                        | Allowable Exceedance Air Blast (dB/Lin)                      |
|--|--------------------|--------------------------------------|--|--|
| Non-mine owned residences <sup>1,2</sup> | 10                 | 120                                  | 0%   | 0%   |
|  | 5 mm/s             | 115                                  | 5 % of the total number of blasts over a period of 12 months | 5 % of the total number of blasts over a period of 12 months |

1. The air blast impact assessment criteria is to be measured at any point which is located at least 3.5 m from any building or structure at any nearby residential property that is non-mine owned or subject to a private agreement with the landowner.
2. Unless otherwise agreed with the relevant owner/s of the residence and Ravensworth Operations has advised the DPE in writing in terms of this agreement.

#### 4.1.2 Infrastructure

The impact assessment criteria for private and publicly owned structures in proximity to the Ravensworth Complex are included in **Table 4.2**.

Table 4.2 Impact Assessment Criteria for Structures

| Type of Structure   | Ground Vibration Criterion (mm/s) | Allowable Exceedance Vibration (mm/s) |
|---|-----------------------------------|---------------------------------------|
| Electricity transmission lines                              | 50 <sup>2</sup>                   | 0%                                    |
| Conveyors (including the Hunter Valley Operations conveyor) | 100 <sup>1</sup>                  | 0%                                    |
| Main Northern Railway line (culverts and bridges)           | 25 <sup>2</sup>                   | 0%                                    |
| Narama Dam wall and proposed dam wall                       | 25 <sup>2</sup>                   | 0%                                    |
| Ashton Underground Mine                                     | 6 <sup>1</sup>                    | 0%                                    |

1. Unless otherwise agreed with the relevant infrastructure provider, owner or regulator (in relation to the dams), and the Proponent has advised the Department in writing of the terms of this agreement.
2. A private agreement has been obtained in consultation with the infrastructure provider regarding this specific Ground Vibration Criterion for this infrastructure.

As noted within **Section 4.1**, impact assessment criteria for infrastructure items have been developed through consultation with regulatory authorities in consideration of research undertaken and in consultation with the relevant infrastructure owner.

Ravensworth Complex held discussions with and was granted approval by then New South Wales Dam Safety Committee to remove the blast monitors on the Narama Dam wall in February 2016, due to the decreasing proximity of blasting.

Ravensworth Complex also held discussions with TransGrid and Ashton Underground Coal Mine (AUCM) in March 2016 and was granted approval to remove blast monitoring instrumentation for monitoring the electricity transmission lines and AUCM due to the decreasing proximity of blasting.

Ravensworth Complex advised the Department of Planning Environment (DPE) in writing on the 4 April 2016 of the agreements reached with TransGrid, the NSW Dam Safety Committee and AUCM.

Blast limits for conveyors may be revised by negotiation with infrastructure owners where further research indicates increased blast limits will not significantly affect this infrastructure, unless agreed criteria have already been established with the relevant infrastructure owner (refer to **Section 4.2**).

### 4.1.3 EPL Conditions

Ravensworth Complex operate under Environment Protection Licence (EPL) 2652. EPL 2652 contains blasting conditions consistent with PA 09\_0176 with respect to blasting times (Condition L6.1), number of blasts per day and per week (Condition L6.2) and overpressure and ground vibration criteria (Conditions L6.4 to L6.6).

In addition to this, EPL 2652 contains specific requirements around monitoring locations and includes an additional obligation around blast fume emissions. Condition L6.6 of EPL 2652 requires that offensive blast fume must not be emitted from the premises, and defines an offensive blast fume as follows:

*Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character of quality, or the time at which they are emitted, or any other circumstances:*

- 1. are harmful to (or likely harmful to) a person that is outside the premises from which it is emitted, or*
- 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.*

### 4.1.4 Historical Heritage Structures

Impact assessment criteria for European heritage structures as identified in PA 09\_0176 are detailed in **Table 4.3** below.

*Table 4.3 Impact Assessment Criteria for Heritage Structures*

| Site                               | Air Blast Criterion<br>(dB Linear Peak) <sup>1</sup> | Ground Vibration<br>(mm/s) | Allowable Exceedance   |
|------------------------------------|--|----------------------------|--|
| Camberwell Church                  | 120  | 10                         | 0%   |
|                                    | 115  | 5                          | 5 % of the total number of blasts over a period of 12 months |
| Chain of Ponds Hotel               | 133  | 10                         | 0%   |
| Ravensworth Homestead <sup>2</sup> | 126  | 10                         | 0%   |
| Ravensworth Public School          | 133  | 10                         | 0%   |

- 1. The airblast impact assessment criteria is to be measured at any point which is located at least 3.5 metres from any building or structure at any nearby residential property that is non-mine owned or subject to a private agreement with the landowner.*
- 2. Established by Liddell Colliery for consent DA 305-11-01.*

As detailed within **Table 4.3**, impact assessment criteria for heritage structures have been established through existing consents. The vibration criteria detailed within the Liddell Colliery DA 305-11-01, which is applicable to the Chain of Ponds Hotel, has also been applied to the Ravensworth Homestead and the Ravensworth Public School. It is noted that in accordance with DA 305-11-01, this criteria is the subject of regular review in accordance with existing development consent requirements.

#### 4.1.5 Aboriginal Archaeological Features

Impact assessment criteria for the Aboriginal axe grinding groove site (REA 86) within the Ravensworth Complex is detailed in **Table 4.4**. The REA 86 grinding grooves are approximately 250 m to the north of the approved open cut pit (refer to **Figure 1.2**).

*Table 4.4 Ground Vibration Limits for Aboriginal Archaeological Features*

| Site   | Ground Vibration Criterion (mm/s) | Allowable Exceedance |
|--|-----------------------------------|----------------------|
| Aboriginal axe grinding groove site (REA 86) | 175 <sup>1</sup>                  | 0%                   |

<sup>1</sup> Subject to meeting incremental limits under condition 10A.

Condition 10A of Schedule 3 of PA09\_0176 states:

*The Proponent shall ensure that blasts on site do not cause exceedance of the following incremental ground vibration limits at the Aboriginal axe grinding groove site (REA 86):*

- a) 60mm/s;
- b) 120mm/s; and
- c) 175mm/s

*Without the prior approval of the Secretary.*

*In seeking the Secretary's approval for an incremental increase in the ground vibration limit from (a) to (b) to (c) above the Proponent shall provide a report prepared by a suitably qualified expert, in consultation with OEH and relevant Aboriginal groups, demonstrating that blasting at these limits is not having any discernible impact on the Aboriginal axe grinding groove site (REA86).*

The Ravensworth Complex consulted with Aboriginal groups and submitted as part of the modification a detailed report prepared by a specialist geotechnical consultant Terrock Pty Limited (Terrock).

Terrock found that peak vibration levels in the order of 280 mm/s are required to damage the weakest category of sandstone listed, based on available data for the strength characteristics of sandstone (from AusIMM Field Geologists' Manual). Terrock also found that for average strength sandstone, vibration levels in the order of 866 mm/s are required to cause potential damage.

Therefore, the recommended limit of 30 mm/s at REA 86 offered a considerable safety factor, the limit was increased to include incremental increases to 175 mm/s. Management measures for the conservation of REA 86, as detailed by Terrock, are detailed in **Section 5.1.2**.

## 4.2 Revision of Impact Assessment Criteria

The blasting impact assessment criteria presented in **Tables 4.1 to 4.4** have been developed in consideration of existing PA09\_0176 and EPL2652 requirements and also through the completion of research in relation to the impacts of vibration on particular structures.

Ravensworth Complex may therefore in the future, seek to alter the vibration criteria subject to the results of further detailed assessments and / or through further consultation with relevant government agencies and infrastructure owners as outlined in PA09\_0176.

As detailed in **Section 4.1.2**, Ravensworth Complex will advise DPE in writing of any agreements reached with relevant infrastructure owners or surrounding mining operations regarding the revision of the blasting impact assessment criteria contained within **Tables 4.1 to 4.4**.

## 5. Blast Management Controls

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In order to mitigate any potential impacts from blasting activities, a number of management controls will be implemented throughout the life of the operation. These controls are detailed in **Section 5.1**.

### 5.1 Operational Controls

The Ravensworth Complex will implement the following blast management practices over the life of the Project:

- Blasting at the Ravensworth Complex will only occur on Monday to Saturday between 9.00 am and 5.00 pm.
- No blasting will be undertaken on Sundays, public holidays or at any other time, unless written approval is obtained from the Secretary of DPE.
- Blasting will be undertaken at a maximum of two blasts per day and no more than 10 blasts per week averaged over a 12-month period, for all blasts undertaken at the Ravensworth Complex. However, this total number of blasts does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately owned land, or to blasts required to ensure the safety of the mine or its workers in accordance with Condition 12 of Schedule 3 of the Project Approval.
- Detailed design is undertaken for each blast in order to maximise the blast efficiency, minimise dust, fumes, ground vibration and air blast, the potential for flyrock and to ensure compliance with site specific blasting conditions.
- Fume will be managed in accordance with the *Post-Blast Fume Management Procedure* (RAVCX-307024981-4595) (Refer to **Section 5.1.1** for additional information).
- Blasts will be charged and fired in accordance with site-based procedures including the *Explosives Management Plan*, RAVOC-258458278-186.
- Blasting operations at the Ravensworth Complex will be undertaken in accordance with the blasting protocols that have been implemented to reduce potential cumulative blasting impacts (refer to **Section 5.2**).
- Blasts will be undertaken in accordance with the Ravensworth Complex's Pre-Blasting Assessment process which includes:
  - An inversion assessment on the morning of the blast to assess whether adverse weather conditions will exacerbate blast overpressure impact on surrounding receivers.
  - Undertaking meteorological assessments prior to blasting to ensure weather conditions are acceptable. Wind speed and wind direction will be assessed against site criteria that have been developed to identify unfavourable conditions for sensitive receivers. Ravensworth Complex will modify the defined unfavourable meteorological conditions in response to mine progression,– *Pre-Blasting Environmental Assessment* should be referred to for the current blasting criteria.



In the event that unfavourable meteorological conditions are observed prior to the blast (10m/s in over a 10 minute averaging period), the Drill and Blast Engineer will enact a red zone blast that requires liaison with the E&C Department and Operations Manager to determine whether to delay or postpone the blast. The pre-blast assessment is also to include a review of the blast monitors to ensure they are operating.

- Notifying neighbouring mines, relevant authorities, neighbouring properties and internal contacts prior to blasting.
  - The public will be provided with up to date information regarding the blasting schedule via the process outlined in **Section 7.2**.
  - Documentation of the date, location of blast holes and quantity of explosive used each day.
- Detailed monitoring of blasts over the life of the mine at relevant blast sensitive locations (refer to **Section 6**).
  - No blasting will take place outside of land owned by Ravensworth Complex, unless a written agreement with the landowner has been obtained and the DPE has been advised, in accordance with Condition 16(b) of Schedule 3 of PA09\_0176. If blasting is to take place within 500 m of any privately owned land or any occupied residence, Ravensworth Complex will detail suitable arrangements to minimise fly rock related issues to the satisfaction of the owner / occupier and the Secretary.
  - The Ravensworth Complex has an agreement with HVO to allow blasting within 500 m. The *HVO – ROC Blast Protocol* (RAVOC-258458278 – 960) describes the controls for the management of blasting within 500m of HVO.
  - Training will be provided to all relevant personnel on environmental obligations, operation of blast and weather monitoring systems in relation to blasting controls in accordance with the site based training needs analysis.
  - Periodic review of blast management procedures to evaluate performance and identify corrective action, if required.
  - The Ravensworth Complex will monitor blasts as mining progresses, in accordance with the existing blast monitoring system, so blast prediction site laws can be further refined and future blast designs be optimised based on more detailed site information.
  - Implementation of the Road Closure Management Plan (RCMP) (**Appendix A.4**) when blasting within 500m Lemington Road, as required by Condition 16(a) and 17(d), Schedule 3 of PA09\_0176. The RCMP has been prepared in consultation with Singleton Shire Council to safely manage temporary road closures when blasting activities from Ravensworth Complex are within 500m of Lemington Road.

### 5.1.1 Post-Blast Fume Management

The *Post Blast Fume Management Procedure* (RAVCX-307024981-4595) outlines mitigation and management measures for post blast fume generation at Ravensworth Open Cut. The procedure also

details the appropriate emergency response to be instigated where a person believes they have been exposed to post blast fume.

Current research in the field of blasting related fume events have determined that the blast fume events can occur for a variety of reasons and are sometimes unavoidable due to a number of potential causes (Australian Explosives Industry Safety Group 2011). These causes include:

- Explosive Formulation and Quality Assurance ;
- Explosives Product Selection;
- On Bench Practices (e.g. sleep time, hole water conditions, dewatering etc.);
- Weather and Climate;
- Geology of the Drill and Blast Zone;
- Inappropriate Blast Design;
- Contamination of Blast Zone (e.g. explosives mixing with drilling muds / sediment in the drill hole); and
- Incorrect priming of blast holes.

The *Post Blast Fume Management Procedure* contains a detailed list of potential causes of fume, with likely indicators to aid in identification of causes and specific management actions for each.

Fume considerations are also included in the pre-blasting environmental assessment and is described in the *Pre-Blasting Assessment, Notification and Clearance Planning Procedure* (RAVCX-255487460-58).







Ravensworth Complex utilises the AESIG (2011) Visual NO<sub>x</sub> Fume Rating Scale (see **Figure 5.1**) to assess fume for recording and reporting purposes, the methodology for assessment is included in RAVCX-307024981-4595.

Fume is measured on a simple scale from 0 to 5 and the extent of the fume is assessed on a simple scale from A to C where:

- A – localised (i.e. fume localised across only a few blast holes);
- B – medium (i.e. fume from up to 50% of blast holes in the shot); and
- C – extensive (i.e. extensive generation of fume across the whole blast).

In the event of blast fume having a rating of  $\geq 4$ , or an event that is rated 3 and leaves the site boundary, the ECM must be notified immediately. For further information refer to **Section 6.3.3** and the *Post Blast Fume Management Procedure*.

Figure 5.1 AESIG Post-Blast Fume Rating Guideline

| Level                                  | Typical Appearance   |
|--|--|
| <b>Level 0</b> No NOx gas              |    |
| <b>Level 1</b> Slight NOx gas          |    |
| 1A Localised                           |  |
| 1B Medium                              |  |
| 1C Extensive                           |  |
| <b>Level 2</b> Minor yellow/orange gas |    |
| 2A Localised                           |  |
| 2B Medium                              |  |
| 2C Extensive                           |  |
| <b>Level 3</b> Orange gas              |  |
| 3A Localised                           |  |
| 3B Medium                              |  |
| 3C Extensive                           |  |
| <b>Level 4</b> Orange/red gas          |  |
| 4A Localised                           |  |
| 4B Medium                              |  |
| 4C Extensive                           |  |
| <b>Level 5</b> Red/purple gas          |  |
| 5A Localised                           |  |
| 5B Medium                              |  |
| 5C Extensive                           |  |

## 5.1.2 Management Controls for the Conservation of REA86

In accordance with the *Ravensworth Complex Aboriginal Cultural Heritage Management Plan*, the following blasting related management measures have been developed for Aboriginal heritage site REA 86:

- Measurement of vibration resulting from mine blasts in the vicinity of REA 86, will be undertaken;
- Data from these measurements will be analysed, and reviewed to confirm that blast vibration is in compliance with the blast criteria for REA 86 (refer to **Table 4.4**);
- A record of vibration levels will be maintained. The process of incremental increase of vibration levels will be undertaken in accordance with PA09\_0176 Schedule 3, Condition 10A.
- Where vibration exceedance is detected, appropriate steps will be taken in accordance with site procedures to amend blasting practice. The exceedance will be reported by letter to the appropriate stakeholders including DPE and Ravensworth Complex registered Aboriginal parties (RAPs). The letter will also include the measures to be implemented to avoid a recurrence; and
- Monitoring of vibration levels experienced at REA 86 will be undertaken to ensure continuing compliance with the blast criteria, until blasting is one kilometre from the site, at which distance vibration levels are insignificant (with estimated 3.9 mm/s PPV levels).

## 5.2 Blast Management Consultation Protocol

To minimise the potential for blasting to occur simultaneously with neighbouring mines, communication is undertaken to notify of intended blast times. Where there is potential for blasts at the Ravensworth Complex to occur concurrently with blasting at other mines, blasting times will be varied where possible. The intent of this is to avoid the possibility of overpressure and vibration wave reinforcement due to simultaneous detonation.

Ravensworth Complex currently has blasting agreements with Hunter Valley Operations (HVO) for their conveyor to the west of Ravensworth North pit, with agreed vibration limits.

Ravensworth Complex also has an agreement with Australian Rail Track Corporation Ltd (ARTC) not to undertake blast monitoring at the Main Northern railway bridges and culverts due to the distance from their infrastructure and low potential for blasting related impacts.

Blasting is no longer required in the Narama Mining Area as blasting activities were completed in late 2015. Ravensworth Complex has since consulted with Ashton Coal Operations Limited (ACOL) and reached an agreement not to undertake any further blast monitoring at AUCM, as required by Table 8 of Project Approval 09\_0176 and **Table 4.2**.

The cessation of mining in Narama Mining Area has also allowed for the removal of blast monitoring requirements for the Narama Dam wall as required by Table 8 of PA 09\_0176 and **Table 4.2**.

Ravensworth Complex in consultation with TransGrid, sought approval in March 2016 to no longer monitor ground vibration at the electricity transmission line, as required by Table 8 of PA 09\_0176 and **Table 4.2**.

## 5.3 Continuous Improvement

### 5.3.1 Best Practice Noise Mitigation Measures

Where possible, the Ravensworth Complex will attempt to implement all reasonable and feasible best practice blast mitigation measures. The basis for continuous improvement of blast mitigation measures will be through the ongoing monitoring of blast impacts and the corrective / preventative action process (refer to **Section 7.4**). Any new mitigation measures that are implemented as a result of these investigations will be reported in the Annual Review (**Section 7.3.1**).

The Ravensworth Complex will also maintain awareness of new technologies for blast mitigation through participation in relevant industry groups.

Performance against the site BMP and associated procedures is to be assessed annually using a process such as Planned Task Observations (PTO).

### 5.3.2 Operational Risk Assessment

In accordance with GCAA's protocol *11.11 Noise Management* and *11.01 Environment and Community Risk Assessments* procedure, an annual environment and community risk assessment review will be undertaken. The annual environment and community risk assessment will include an assessment of activities at the Ravensworth Complex that influence blast impacts on the surrounding community and sensitive receivers, noise monitoring trends and implementation of controls. If required, this BMP will be updated accordingly in accordance with **Section 7.6**, if the annual environment and community risk assessment identifies further improvements to blast management and additional mitigation measures where appropriate.

### 5.3.3 Training

To ensure the effective implementation of this BMP, applicable Ravensworth Complex personnel and contractors will be advised of blast management requirements via the Ravensworth Complex training management system. Additional blast management awareness, including toolbox talks as necessary, will be provided to applicable personnel and contractors who require specific skills or knowledge relating to blast impacts and mitigation. Topics covered for blast awareness training, may include:

- Site specific objectives and targets for blast management;
- Relevant environmental legislation and approval conditions;
- Relevant blast procedures and controls to manage environment and community impacts;
- Blast monitoring systems;
- Associated environment and community reporting; and
- References to site drill and blast operational procedures.

In addition, job specific training will be undertaken for drill and blast operators (including contractors) and personnel tasked with the operation of blast vibration, blast fume, blast dust and meteorological monitoring equipment/systems.



## 6. Blast Monitoring

As detailed in **Section 5.1**, the Ravensworth Complex will continue to monitor blasts as mining progresses in accordance with the existing blast monitoring system so that prediction site laws can be further refined, and future blast designs can be optimised based on more detailed site information. The blast monitoring program to be implemented is detailed in **Section 6.1**.

### 6.1 Blast Monitoring Program

This BMP incorporates real time monitoring at locations shown in **Figure 1.2**, which is consistent with PA09\_0176 blasting criteria specified in **Tables 4.1 – 4.4** and EPL 2652. The location of the nearest private resident (**Figure 1.2**) is likely to change as mining progresses and therefore the blast monitoring locations may be required to be amended to reflect these changes.

To ensure compliance with Ravensworth Complex blast impact assessment criteria (**Section 4.1**), monitoring or modelling is undertaken for all proposed blasts.

Initial blasting impacts on locations including the Chain of Ponds Hotel, Ravensworth Homestead, and Ravensworth Public School will be determined through the use of detailed predictive modelling, which has been developed based on extensive blast monitoring and detailed blast design. As soon as predictive modelling at a location that doesn't have a permanent blast monitor indicates a potential predicted blast impact of 80 % of approved ground vibration and/or 90 % of approved air blast overpressure, the blast will be monitored to assess compliance with blasting impact assessment criteria.

The infrastructure blast monitoring locations may change depending on the risks and location of Ravensworth Complex current mining activities. Results obtained from the blast monitoring program are utilised to inform the detailed design of blasts and modification of blast designs as necessary. Ravensworth Complex utilises a trigger early warning unit (EWU) (see **Figure 1.2**) for the management of blasting, this monitor will be relocated from time to time as the open cut pit shell progresses.

#### 6.1.1 Blast Data

Management of blast monitoring records will be undertaken in accordance with the *Ravensworth Pre-Blasting Assessment, Notification and Clearance Planning Procedure* RAVCX-255487460-58, which ensures the nearest private residence is appropriately monitored. Blasting records will be maintained in accordance with statutory conditions, refer to **Section 7.5**.

The procedure (RAVCX-255487460-58) includes the following information (in accordance with **Section 5.1**):

- Notifying neighbouring mines and neighbouring properties prior to blasting;
- Undertaking meteorological assessments prior to blasting to ensure weather conditions are acceptable; and
- Reviewing that blast monitors are functioning.

Data collected from the monitoring of each blast will include:

- Measured vibration;

- Measured overpressure (where relevant);
- Maximum instantaneous charge;
- Distance from blast to monitoring location;
- Number of holes;
- Blast type; and
- Meteorological conditions.

## 6.1.2 Meteorological Monitoring

Meteorological based constraints are considered for all scheduled blasting events by Ravensworth Complex. A pre-blast protocol has been established so that the implications of adverse meteorological conditions are considered prior to blasting. Adverse meteorological conditions may have the potential to exacerbate dust, fume and overpressure impacts on nearby residents and neighbouring mining operations (refer to **Section 5.1**). The Ravensworth Complex weather station consists of logged meteorological parameters including:

- Wind speed and wind direction;
- Sigma-theta from sampled wind direction measurements;
- Temperature; and
- Rainfall.

## 6.2 Monitoring Standards

Meteorological monitoring is also to be undertaken in accordance with the latest version of *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (EPA, 2022). The Ravensworth Complex will undertake blast monitoring in accordance with the policies, principles, regulation and guidelines contained within:

- *Protection of the Environment Operations Act 1997* (PoEO Act) administered by the EPA;
- EP&A Act administered by the DPE; and
- ANZECC '*Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration*'.

Instrumentation used to measure and record the ground vibration and airblast overpressure levels will meet the requirements of *Australian Standard AS 2187.2-2006 (Explosives – Storage, Transport and Use - Use of Explosives)* and with manufacturer's specifications.

All associated records to conduct the calibration of the blast monitoring instrumentation are maintained in accordance with the National Association of Testing Authorities (NATA) and **Section 7.5**.

Regular monthly servicing is also undertaken in accordance with commercial agreements between the supplier of the blast monitoring instrumentation and Ravensworth Complex.

## 6.3 Compliance Assessment Protocol

### 6.3.1 Blast Monitoring Evaluation

The blast monitoring results, including vibration and overpressure will be reviewed after each blast to evaluate compliance. Any non-compliance or exceedance of the blast impact assessment criteria in **Section 4.1** will be managed in accordance with the Response Protocols outlined **Table 6.1 (Section 6.3.3)** and reported in accordance with **Section 6.4**.

### 6.3.2 Blast Fume Monitoring

The extent of fume generated from a blast are assessed against the AEISG (2011) Blast Fume Classification Table (**Section 5.1.1**). In addition to visual monitoring of fume, a video of each blast is also recorded. Response Protocols for fume events are outlined **Table 6.1 (Section 6.3.3)** and reported in accordance with **Section 6.4**.

### 6.3.3 Response Protocols

Ravensworth Complex have developed response protocols (**Table 6.1**) in the event a potential exceedance of the blast impact assessment criteria and/or a fume event has occurred.

*Table 6.1 Blasting Trigger Action Response Plan*

| Performance Criteria  | Trigger  | Action  | Response   |
|---|--|---|--|
| Vibration and Overpressure results within relevant blast impact assessment criteria as outlined in <b>Section 4.1</b> | Monitoring data of blast vibration or overpressure results exceeds the relevant impact assessment criteria as outlined in <b>Section 4.1</b> | <p>Check and validate data.</p> <p>Notify the ECM or delegate.</p> <p>Undertake investigation to confirm if investigation trigger exceedance is mining-related and if necessary, engage a suitably qualified person.</p> <p>If investigation confirms trigger exceedance is not mining-related, record data and cease investigation. If trigger exceedance is mining related:</p> <p>Notify DPE and EPA and other relevant agencies as soon as practicable as required by <b>Section 6.4</b></p> <p>Notify affected landowners, RAPs, infrastructure owners and other mining operations.</p> <p>Complete preliminary investigation report and provide to DPE and relevant agencies within 7 days of identifying the incident (<b>Section 6.4</b>).</p> <p>The Ravensworth Complex will enter any exceedances of</p> | <p>Where blasting activities result in a vibration or overpressure trigger exceedance, implement contingency and remedial measures based on investigation. Measures may include:</p> <p>Review, and if necessary, revise blast controls (<b>Section 5.1</b>).</p> <p>Review and revise if necessary this BMP and re-submit to DPE (<b>Section 7.6</b>).</p> <p>Complete agreed management and mitigation measures with affected landowners, RAPs, infrastructure owners and other mining operations as required.</p> <p>Training of applicable personnel (<b>Section 5.3.3</b>).</p> <p>Provide summary of the incident in Annual Review (<b>Section 7.2.1</b>).</p> |

|   |   | vibration and overpressure criteria into CMO.   |  |
|---|---|---|--|
| Performance Criteria  | Trigger   | Action  | Response   |
| No emission of offensive Blast fumes that are harmful to (or likely harmful to) a person that is outside the premises or interferes unreasonably with a person outside the premise. | Blast fume rated at Level $\geq 4$ and/or Level 3 or higher and leaves site boundary. | <p>The ECM (or delegate) will initiate the Pollution Incident Response Management Plan, including notification of the DPE, EPA and other relevant agencies (refer to PRIMP and <b>Section 6.4</b>).</p> <p>The ECM or delegates will notify affected landholders of a potential blast fume event advise personnel to avoid potential exposure to the blast fume.</p> <p>Complete preliminary investigation report and provide to DPE and relevant agencies within 7 days of identifying the incident (<b>Section 6.4</b>).</p> <p>The Ravensworth Complex will enter any exceedances of blast fume criteria into CMO.</p> | <p>Where blasting activities result in a fume event trigger exceedance, implement contingency and remedial measures based on investigation. Measures may include:</p> <p>Providing blast fume related information to stakeholders.</p> <p>Review and if necessary, revise blast management controls (<b>Section 5.1</b>).</p> <p>Review and revise if necessary this BMP and re-submit to DPE.</p> <p>Training of applicable personnel (<b>Section 5.3.3</b>).</p> <p>Provide summary of the incident in Annual Review (<b>Section 7.2.1</b>).</p> |

Ravensworth Complex will also implement mitigating measures for future blasts as necessary and monitor future blasts for effectiveness and improvement opportunities. For further responses and corrective actions refer to **Section 7.4**.

In accordance with Condition 2 of Schedule 4 of the Project Approval, within two weeks of obtaining monitoring results showing an exceedance of the criteria in **Section 4.1**, Ravensworth Complex will notify the affected landowner and/or tenants in writing of the exceedance and provide regular monitoring results to each party until the project is complying with the relevant criteria again.

## 6.4 Incident Reporting

In accordance with Condition 6 of Schedule 5 of PA09\_0176, as soon as practicable following identification of an exceedance of the blast assessment criteria provided in **Tables 4.1 to 4.4** or a blast fume event has occurred, Ravensworth Complex will report the exceedance to the relevant authorities including the DPE and EPA.

In addition, in accordance with Condition 6 of Schedule 5 of the PA09\_0176, within seven days of becoming aware of the incident, Ravensworth Complex will provide the Secretary and any relevant agencies with a detailed report on the incident. The report will include the following details:

- Date, time and nature of the exceedance/incident;
- Identify the likely cause of the exceedance/incident;
- Describe the response action that has been undertaken to date; and
- Describe the proposed measures to address the exceedance/incident.

In the event fume from a blast has been classified a pollution incident, a notification will also be conducted as per the processes outlined in the *Ravensworth Complex Pollution Incident Response*

*Management Plan* (PIRMP), as required by Part 5.7A of the POEO Act and the *Protection of the Environment Operations (General) Regulation 2009* (POEO (G) Regulation). Refer to the PIRMP for further details of notification of environmental incidents under the PRIMP.

## 6.5 Property Inspections and Investigations

### 6.5.1 Property Inspections

In accordance with Condition 13 of Schedule 3 of PA09\_0176, should Ravensworth Complex receive a written request from the owner of any privately owned land within three kilometres of any approved blasting operations, Ravensworth Complex will:

- a) within two months of receiving the request commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to
  - Establish the baseline condition of any buildings and other structures on the land;
  - Identify measures that should be implemented to minimise the potential blasting impacts of the project on these buildings or structures; and
- b) Give the landowner a copy of the property inspection report.

### 6.5.2 Property Investigations

If any landowner of privately-owned land within three kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the Ravensworth Complex, then within two months of receiving this request Ravensworth Operations will:

- a) Commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and
- b) Give the landowner a copy of the investigation report.

If the independent property investigation confirms the landowners claim, and both parties agree with the findings, then the Ravensworth Complex shall repair the damage to the satisfaction of the Secretary of the DPE.

If Ravensworth Complex or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary of DPE for resolution.

## 6.6 Independent Review

In accordance with the requirements of the PA09\_0176, all private landowners within three kilometres of the project are entitled to a structural property inspection, as per Condition 1(a) of Schedule 4 and Condition 13 of Schedule 3 of PA09\_0176.

In the event that a landowner considers Ravensworth Complex to be exceeding blast criteria at his or her property, the landowner may request an independent review of the blast impacts at the property. The independent review will be conducted in accordance with the procedure described in Conditions 3, 4 and 5 of Schedule 4 of PA09\_0176. A summary of the independent review process is provided.

If the independent review determines that the project is complying with the relevant criteria in Schedule 3, then the Ravensworth Complex may discontinue the independent review with the approval of the Secretary.

If the independent review determines that the project is not complying with the relevant criteria in Schedule 3, and that the project is primarily responsible for this non-compliance, then Ravensworth Complex shall:

- implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until the project complies with the relevant criteria; or
- secure a written agreement with the landowner to allow exceedances of the relevant criteria, to the satisfaction of the Secretary.

If the independent review determines that the relevant criteria in schedule 3 are being exceeded, but that more than one mine is responsible for this non-compliance, then together with the relevant mine/s, the Ravensworth Complex shall:

- implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until there is compliance with the relevant criteria; or
- secure a written agreement with the landowner and other relevant mines to allow exceedances of the relevant criteria, to the satisfaction of the Secretary.

If the independent review determines that the project is not complying with the relevant acquisition criteria in Schedule 3, but that more than one mine is responsible for this non-compliance, then upon receiving a written request from the landowner, Ravensworth Complex shall acquire all or part of the landowner's land on as equitable a basis as possible with the relevant mine/s, in accordance with the procedures in Conditions 6 and 7 of PA09\_0176. A summary of the land acquisition process is provided in **Section 6.7**.

## 6.7 Land Acquisition Process

Within 3 months of receiving a written request from a landowner with acquisition rights, Ravensworth Complex shall make a binding written offer to the landowner based on:

- (a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project, having regard to the:
  - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
  - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of any additional mitigation measures required under Condition 6, 7 or 22 of Schedule 3 of PA09\_0176;
- (b) the reasonable costs associated with:
  - relocating within the Singleton or Muswellbrook local government areas, or to any other local government area determined by the Secretary; and

- obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and
- (c) reasonable compensation for any disturbance caused by the land acquisition process.

Ravensworth Complex shall pay all reasonable costs associated with the land acquisition process described in Condition 6, Schedule 4 of PA09\_0176, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of the Registrar-General.

## 7. Reporting and Reviewing

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### 7.1 Internal Reporting

The ECM will report to the Operations Manager the results of investigations of any complaints, any exceedances of the blast overpressure or vibration assessment criteria and/or a blast fume event.

If a non-compliance with the blast impact assessment criteria and/or a blast fume event is identified during the compliance assessment protocol (**Section 6.3**), an internal report detailing the circumstances of the non-compliance and resulting actions will be developed and submitted to Glencore Coal Assets Australia (GCAA). External reporting of an incident and/or non-compliance will be undertaken in accordance with **Section 6.4** and **Section 7.2**.

### 7.2 External Reporting

A summary of all blast monitoring results will be made publicly available on the Ravensworth Complex website in accordance with Schedule 5, Conditions 7 and 10 of PA09\_0176.

In accordance with *Protection of the Environment Legislation Amendment Act 2011* (Amendment Act), the Ravensworth Complex will also provide monitoring data on its website within 14 days of obtaining the data.

The Ravensworth Complex will provide up to date information regarding the proposed blasting schedule via the process outlined below:

- Notify neighbouring mining operations;
- Contact the Community contact line on **1800 062 553**;
- Notify sensitive receivers using site-based processes individualised for each recipient as requested; and
- Advertise in The Singleton Argus when Lemington Road is to be closed due to blasting at the Ravensworth Complex, as well as identifying proposed blasting times on road signage established in the vicinity of the Ravensworth Complex in accordance with the internal *RAV MIN PRO 0011 Closing Public Roads for Blasting*.

A summary of blast monitoring results will also be presented to the Ravensworth Complex Community Consultative Committee (CCC) meetings.

#### 7.2.1 Annual Review

In accordance with Condition 34, Schedule 5 of PA09\_0176 Ravensworth Complex will conduct an Annual Review of its operations prior to 31 March for the preceding calendar year. This annual review will include, but not limited to:

A comprehensive review of the monitoring results and complaints records of Ravensworth Complex over the previous calendar year, which includes a comparison of these results against the:

- Relevant statutory requirements, limits or performance measures/criteria;
- Monitoring results of previous years; and



- Relevant predictions in the EA.
- Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance.
- Identify any trends in the monitoring data over the life of the project.
- Identify any discrepancies between the predicted and actual impacts and analyse the potential cause of any significant discrepancies; and
- Describe what measures will be implemented over the next year to improve the environmental performance of the project.

The Annual Review will be made publicly available on the Ravensworth Complex website in accordance with Condition 10, Schedule 5 of PA09\_0176.

## 7.3 Complaints Response

In accordance with the Environmental Management Strategy (EMS), the ECM will maintain a centralised location to record communications details of relevant external stakeholders and procedures for stakeholder contact including a Complaints Procedure.

The Complaints Procedure will utilise the Community Enquiries Line that will be regularly advertised in a local newspaper. The Enquiries Line will be in operation 24 hours per day, seven days a week.

Community complaints will be recorded and investigated by the ECC. All other complaints, via letter, in person, email or by fax, will also be recorded and investigated. An Initial response to the complainant will be made as soon as practicable.

Where applicable and agreed by the complainant, monitoring will be arranged at or near the complainant's residence. The complainant is to be advised of these arrangements once made.

In the event that a complaint is received in relation to blast impacts from the operation, an investigation will be undertaken in accordance with the relevant *GCAA 10.05 Community Complaint Management Protocol*, which provides guidance to GCAA operations in the management of incidents.

Follow up correspondence with the complainant will be made explaining the outcome of complaint investigations.

A register of all community complaints, updated monthly, will be made publicly available on the Ravensworth Complex website in accordance with Schedule 5, Condition 10 of PA09\_0176.

## 7.4 Corrective Action

**Table 7.1** summarises the potential blasting related issues that may arise and the appropriate corrective action to be taken.

*Table 7.1 Corrective Actions*

| Issues/Opportunity  | Corrective Action   |
|---|---|
| <b>Exceedance of blasting assessment criteria of PA09_0176 and EPL2652 conditions for air blast, ground vibration criteria.</b> | <p>Notify DPE and EPA and other relevant agencies as soon as practicable as required by <b>Section 6.4</b></p> <p>Notify affected landowners, RAPs, infrastructure owners and other mining operations.</p> <p>Report complaint to senior management as described in <b>Section 7.1</b>.</p> <p>Complete preliminary investigation report and provide to DPE and relevant agencies within 7 days of identifying the incident (<b>Section 6.4</b>).</p> <p>Undertake further responses and actions as provided in <b>Table 6.1</b>.</p> |
| <b>Blast fume event</b>   | <p>Implementation of the PIMRP</p> <p>Notify DPE and EPA and other relevant agencies as soon as practicable as required by <b>Section 6.4</b></p> <p>Report complaint to senior management as described in <b>Section 7.1</b>.</p> <p>Complete preliminary investigation report and provide to DPE and relevant agencies within 7 days of identifying the incident (<b>Section 6.4</b>).</p> <p>Undertake further responses and actions as provided in <b>Table 6.1</b>.</p>  |
| <b>Community complaints (Blasting)</b>  | <p>Investigation of complaint in accordance with <i>GCAA 10.05 Community Complaint Management Protocol</i>, undertaking mitigating measures where applicable and provide feedback to complainant.</p> <p>Report complaint to senior management as described in <b>Section 7.1</b>.</p> <p>Provide regular monitoring results to affected complainant until the project is complying with the relevant blast criteria again.</p>   |
| <b>Private property damage as a result of blasting operations.</b>  | <p>Notify DPE and EPA and other relevant agencies as soon as practicable as required by <b>Section 6.4</b></p> <p>Investigation of issue in accordance with Condition 14 of Schedule 3 of PA09_0176, and initiation of measures detailed in Conditions 6 and 7 of Schedule 4 of the PA09_0176 where appropriate.</p> <p>Report complaint to senior management as described in <b>Section 7.1</b>.</p> <p>Undertake further responses and actions as provided in <b>Table 6.1</b>.</p>   |

## 7.5 Monitoring Records

In accordance with EPL 2652 conditions, *GCAA 11.12 Blast Management Protocol* and Ravensworth Complex document control procedures, all blast monitoring records will be:

- Kept in a legible form, or in a form that can readily be reduced to a legible form;
- Maintained on site for at least five years; and
- Produced in a legible form to any authorised officer of the EPA who asks to see them.

As a minimum, the following data collected from the monitoring of each blast must be retained includes:

- measured ground vibration;
- measured overpressure;
- maximum instantaneous charge;
- distance from blast to monitoring location;
- number of holes;
- blast type;
- meteorological conditions;
- blast notifications to neighbouring mines and private residences;
- a video recording of each blast event;
- fume colour rating (if required); and
- records of k factors used for each blast.

Blast records will be kept in accordance with site based documents including *Drill and Blast Pattern Design* RAVOC-258458278-1773.

## 7.6 Review

The BMP is to be reviewed in accordance with PA 09\_0176 Schedule 5 Condition 4 within 3 months of:

- The submission of the Annual Review;
- The submission of an incident report;
- The submission of an independent environmental audit (IEA); and
- Any modification to the conditions of PA09\_0176.

Ravensworth Complex will review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

The review process will also consider changes in environmental legislation and guidelines, and technology or operational procedures.

## 7.7 Independent Environmental Audit

In accordance with the Condition 8, Schedule 5 of PA09\_0176, by June 2012 and every three years thereafter, the Ravensworth Complex will commission an Independent Environmental Audit (IEA) to the satisfaction of DPE.

The IEA will include an assessment of the adequacy of the BMP. Where necessary, following the IEA, the BMP will be updated and action taken to improve blasting performance and blasting management practices.

## 8. References

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### 8.1 Legislation

- *Dangerous Goods Act 1975*
- *Environment Legislation Amendment Act 2011*
- *Environmental Planning and Assessment Act 1979*
- *Explosives Act 2003*
- *Work Health Safety Act 2011*
- *Protection of the Environment Legislation Amendment Act 2011*
- *Protection of the Environment Operations Act 1997*

### 8.2 Australian Standards

- *Standards Australia. AS2187.2:2006 Explosives – Storage, Transport and Use*

### 8.3 External

- *AusIMM Field Geologists' Manual*
- *Australian and New Zealand Environment and Conservation Council ANZECC, 1990. Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.*
- *Hansen Bailey, 2013. Narama West Environmental Assessment*
- *Heggies Pty Limited, 2009. Ravensworth Operations Project – Blast Impact Assessment.*
- *Approved methods for the sampling and analysis of air pollutants in NSW (EPA 2022)*
- *Umwelt Australia Pty Ltd, 2010. Ravensworth Operations Project Environmental Assessment*
- *Ravensworth Mine Complex Aboriginal Cultural Heritage Management Plan.*
- *Ravensworth Mine Complex Environmental Management Strategy.*

### 8.4 Ravensworth Open Cut

- *RAVCX-307024981-4595 Post Blast Fume Management*
- *RAVCX-255487460-58 Pre-Blasting Assessment, Notification and Clearance Planning*
- *RAVOC-258458278 – 14917 HVO – ROC Blast Protocol*

## 9. Document Information

### 9.1 Change Information

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in **Table 9.1** below.

*Table 9.1 – Change information*

| Version | Date       | Reviewers                       | Change Summary  |
|---------|------------|---------------------------------|---|
| 1       | 23/04/13   | G Newton, A Kelly               | Review of original approved plan, Ravensworth format  |
| 1.1     | 26/02/14   | G Newton, A Kelly               | Include references to 09_0176 modification and updated procedures etc.<br>Updated based on DoPE comments and feedback               |
| 1.2     | 16/10/2014 | E and C Dept                    | Updated based on DoPE comments and feedback   |
| 1.3     | 30/10/2014 | E and C Dept                    | Final revision prior to submission for approval by DoPE   |
| 2.0     | 11/12/2014 | E and C Dept.                   | Revision and update based on internal review  |
| 3.0     | 16/06/2016 | E and C Dept.                   | Revision of plan after cessation of mining in Narama<br>Finalisation of plan following DPE approval                                 |
| 3.1     | 12/09/2017 | Laura Barben, Travis Zolnikov   | Update to Post Blast Fume Management Procedure attached to document   |
| 3.2     | 22/05/2018 | Laura Barben, Luke Bowden       | Administrative update to Management Plan.   |
| 3.3     | 4/10/2018  | Laura Barben, Sam Palmer        | Revision and update following external audit  |
| 4.0     | 14/01/2019 | M Pollock, S Palmer, K Marchant | Revision and update. Nil major changes  |
| 5.0     | 10/09/2019 | M Pollock, S Palmer             | Removal of Post-Blast Fume Management Procedure from appendix and inclusion of summary in Section 4.1.2. General review and update. |
| 6.0     | 15/04/20   | N/A                             | Document reformatted  |
| 7.0     | 31/08/2022 | Umwelt                          | Updated of the BMP included EPL Conditions, baseline data, compliance assessment protocols and inclusion of TARP                    |

## A.1 Regulatory Requirements

| Schedule | Project Approval Condition  | Section of Document |
|----------|---|---------------------|
| 3        | <b>Blasting Criteria</b><br>10. The Proponent shall ensure that blasts on site do not cause exceedances of the criteria listed in Table 8.  | Section 4.1         |
| 3        | <b>Blasting Criteria</b><br>10A. The Proponent shall ensure that blasts on site do not cause exceedance of the following incremental ground vibration limits at the Aboriginal axe grinding groove site (REA86). <ul style="list-style-type: none"> <li>a) 60 mm/s;</li> <li>b) 120 mm/s; and</li> <li>c) 175 mm/s;</li> </ul> Without the prior approval of the Secretary.<br>In seeking the Secretary's approval for an incremental increase in the ground vibration limit from (a) to (b) to (c) above, the Proponent shall provide a report prepared by a suitably qualified expert, in consultation with OEH and relevant Aboriginal groups, demonstrating that blasting at these limits is not having any discernible impact on the Aboriginal axe grinding groove site (REA86).  | Section 4.1         |
| 3        | <b>Blasting Hours</b><br>11. The Proponent shall only carry out blasting on site between 9.00 am and 5.00 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary of DoP.   | Section 5.1         |
| 3        | <b>Blasting Frequency</b><br>12. The Proponent may carry out a maximum of: <ul style="list-style-type: none"> <li>a) Two blasts a day; and</li> <li>b) 10 blasts a week,</li> </ul> Averaged over a 12 month period, for all open cut operations at the Ravensworth Complex. This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers.<br>Note: For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.   | Section 5.1         |
| 3        | <b>Property Inspections</b><br>13 If the Proponent receives a written request for a property inspection from the owner of any privately owned land within three kilometres of any approved blasting operations. <ul style="list-style-type: none"> <li>a) Within two months of receiving the request, Ravensworth Operations will commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:               <ul style="list-style-type: none"> <li>• Establish the baseline condition of any buildings and other structures on the land;</li> <li>• Identify measures that should be implemented to minimise the potential blasting impacts of the project on these buildings or structures; and</li> </ul> </li> <li>b) Give the landowner a copy of the property inspection report.</li> </ul>   | Section 6.5         |
| 3        | <b>Property Investigations</b><br>14. If the landowner of any privately owned land within three kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the project, then within two months of receiving this request the Proponent shall: <ul style="list-style-type: none"> <li>a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and</li> <li>b) give the landowner a copy of the property investigation report.</li> </ul> If this independent property investigation confirms the landowners claim, and both parties agree with these findings, then the Proponent shall repair the damage.<br>If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution. | Section 6.5         |

| Schedule | Project Approval Condition   | Section of Document |
|----------|--|---------------------|
| 3        | <b>Property Investigations</b><br>14. If the landowner of any privately owned land within three kilometres of blasting operations, or any other landowner nominated by the Secretary, claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the project, then within two months of receiving this request the Proponent shall: <ul style="list-style-type: none"> <li>c) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to investigate the claim; and</li> <li>d) give the landowner a copy of the property investigation report.</li> </ul> If this independent property investigation confirms the landowners claim, and both parties agree with these findings, then the Proponent shall repair the damage. If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution. | Section 6.5         |
| 3        | <b>Operating Conditions</b><br>15. The Proponent shall: <ul style="list-style-type: none"> <li>a) implement best blasting management practice to:               <ul style="list-style-type: none"> <li>• protect the safety of people and livestock in the surrounding area;</li> <li>• protect public or private infrastructure/property in the surrounding area; and</li> <li>• minimise the dust and fume emissions from blasting;</li> </ul> </li> <li>b) coordinate the blasting on site with the blasting at nearby mines to minimise the cumulative blasting impacts of the mines; and</li> <li>c) Operate a system to enable the public to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Secretary.</li> </ul>  | Section 5.1         |
| 3        | 16. The Proponent shall not undertake blasting within 500 m of: <ul style="list-style-type: none"> <li>a) the realigned Lemington Road without the approval of Singleton Council; or</li> <li>b) any land outside the site not owned by the Proponent, unless the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement.</li> </ul>   | Section 5.1         |
| 3        | 17. The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. This Plan must:  | Entire plan         |
|          | a) Be prepared in consultation with the DECCW and be submitted to the Secretary for approval by the end of June 2011;  | Appendix A.2        |
|          | b) Describe the blast mitigation measures that would be implemented to ensure compliance with the relevant conditions of this approval;  | Section 5           |
|          | c) Describe the measures that would be implemented to ensure the public get up-to-date information on the blasting schedule;   | Section 7.2         |
|          | d) Include a road closure management plan, prepared in consultation with Singleton Council;  | Section 7.2         |
|          | e) Include a blast monitoring program for evaluating blast-related impacts (including blast-induced seismic activity) on, and demonstrating compliance with the blasting criteria in this approval for: <ul style="list-style-type: none"> <li>○ Privately owned residences and structures;</li> <li>○ Items of Aboriginal (including REA86 axe grinding grooves) and non-indigenous cultural heritage significance;</li> <li>○ Private and publicly owned infrastructure;</li> <li>○ The RUM and the Ashton Coal underground mine;</li> </ul>   | Sections 6 & 6.3    |
|          | f) Include a protocol that has been prepared in consultation with the owners of nearby mines for minimising and managing cumulative blasting impacts of the mines.   | Section 5.2         |

| Schedule | Project Approval Condition  | Section of Document |
|----------|---|---------------------|
| 5        | <b>Management Plan Requirements</b>   |                     |
|          | 2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:              |                     |
|          | (a) detailed baseline data;   | 3.0                 |
|          | (b) a description of:   |                     |
|          | • the relevant statutory requirements (including any relevant approval, licence or lease conditions);   | 1.6                 |
|          | • any relevant limits or performance measures/criteria;   | 4.0                 |
|          | • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; | 6.3                 |
|          | (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;               | 5.0                 |
|          | (d) a program to monitor and report on the:   | 6.0                 |
|          | • impacts and environmental performance of the project;   |                     |
|          | • effectiveness of any management measures (see (c) above);   |                     |
|          | (e) a contingency plan to manage any unpredicted impacts and their consequences;  | 6.3.3 & 7.4         |
|          | (f) a program to investigate and implement ways to improve the environmental performance of the project over time;  | 5.3                 |
|          | (g) a protocol for managing and reporting any:  |                     |
|          | • incidents;  | 6.4                 |
|          | • complaints;   | 7.3                 |
|          | • non-compliances with the conditions of this approval and statutory requirements; and  | 7.4                 |
|          | • exceedances of the impact assessment criteria and/or performance criteria; and  | 6.3 & 7.4           |
|          | (h) a protocol for periodic review of the plan.   | 7.6                 |
|          | Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans   |                     |



## A.2 Correspondence & Consultation

| Date       | Stakeholder  | Summary of Consultation   | Ravensworth Contact                    |
|------------|--|---|--|
| 24/03/2014 | Environment Protection Authority (EPA) Mitch Bennett | Draft copy of the BMP sent via letter and file transfer site, requesting comment back by 21/04/2014                                     | Andrew Kelly (Ravensworth Complex)     |
| 1/04/2014  | Mitch Bennett (EPA)                                  | Reminder email sent requesting comment on BMP by 21/04/2014   | Greg Newton (Ravensworth Open Cut)     |
| 02/04/2014 | Bill George (EPA)                                    | Letter received from EPA stating that the EPA does not review these documents   | Greg Newton (Ravensworth Open Cut)     |
| 07/04/2014 | Bill George (EPA)                                    | Email sent to EPA confirming which Management plans were being referred to in the letter dated 02/04/2014                               | Greg Newton (Ravensworth Open Cut)     |
| 09/04/2014 | Bill George (EPA)                                    | Email received from EPA confirming that the letter dated 02/04/2014 referred to all the management plans submitted to EPA               | Greg Newton (Ravensworth Open Cut)     |
| 22/09/2014 | Mursaleen Shah (Singleton Council)                   | Approval received from Singleton Council to temporarily close Lemington Rd for the purpose of blasting from 1 June 2014 to 30 June 2014 | Travis Zolnikov (Ravensworth Open Cut) |
| 10/02/2016 | Bill Ziegler Dam Safety Committee (DSC)              | Approval from DSC following cessation of mining in Narama to undertake blast monitoring as required by Ravensworth-2 approval           | Andrew Kelly (Ravensworth Complex)     |
| 7/03/2016  | Ashton Coal Operations Pty Ltd                       | Agreement from Ashton that monitoring at Ashton LW8 does not need to be undertaken due to cessation of blasting in Narama               | Greg Newton (Ravensworth Open Cut)     |
| 30/03/2016 | Transgrid  | Approval from Transgrid regarding the removal of requirement to monitor vibration at transmission towers                                | Greg Newton (Ravensworth Open Cut)     |
| 05/04/2016 | EPA  | Draft copy of the BMP sent via email requesting feedback by 19 April 2016   | Greg Newton (Ravensworth Open Cut)     |
| 13/04/2016 | EPA  | Reminder email sent requesting feedback on draft plan by 19 April 2016  | Greg Newton (Ravensworth Open Cut)     |
| 19/04/2016 | DPE  | Draft copy of the BMP sent via email  | Greg Newton (Ravensworth Open Cut)     |
| 26/04/2016 | EPA  | Letter received from EPA stating don't comment on management plans  | Greg Newton (Ravensworth Open Cut)     |
| 12/05/2016 | DPE  | Reminder email sent requesting feedback on draft plan   | Greg Newton (Ravensworth Open Cut)     |
| 8/06/2016  | DPE  | Reminder email sent requesting feedback on draft plan   | Greg Newton (Ravensworth Open Cut)     |
| 16/06/2016 | DPE  | Final approval of management plan received  | Greg Newton (Ravensworth Open Cut)     |
| 21/09/2017 | DPE  | Final approval of management plan received  | Environment and Community Coordinator  |
| 10/09/2018 | DPE  | Final approval of management plan received  | Environment and Community Coordinator  |
| 05/02/2019 | DPE  | Final approval of management plan received  | Environment and Community Manager      |

## A.3 Management Plan Approval



**Planning,  
Industry &  
Environment**

Energy and Resource Assessments  
Planning and Assessment  
Contact: Caleb Ferry  
Tel: 9274 6170  
Email: [caleb.ferry@planning.nsw.gov.au](mailto:caleb.ferry@planning.nsw.gov.au)

Klay Marchant  
Environment and Community Manager  
Ravensworth Complex  
Glencore  
PO Box 294  
MUSWELLBROOK NSW 2333

Dear Mr Marchant,

**Ravensworth Operations Project (MP 09\_0176)  
Revised Blast Management Plan**

I refer to the revised Blast Management Plan which was submitted to the Department for approval in accordance with Condition 17 of Schedule 3 of the consent for the Ravensworth Operations Project (MP 09\_0176).

The Department has carefully reviewed the document and is satisfied that it adequately addresses the relevant consent conditions. Therefore, the Secretary has approved the plan.

Please ensure that the approved plan is placed on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Caleb Ferry on the details listed above.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M Sprott', followed by the date '05/02/2020' written below it.

Matthew Sprott  
**Director**  
**Resource Assessments**  
as nominee of the Secretary

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320 Pitt Street Sydney 2000 | GPO Box 39 Sydney 2001 | [dpie.nsw.gov.au](http://dpie.nsw.gov.au)

# A.4 Road Closure Management Plan