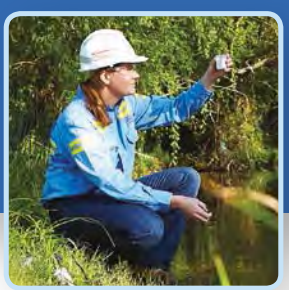
BENGALLA Mining Company

Bengalla Mine

August 2017

Blast Management Plan



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BENGALLA

Bengalla Mining Company Pty Limited

Blast Management Plan

Revision	Date Submitted	Date Approved	Description	Author	Reviewer	Approved
0	31/01/13	-	Draft Blast Management Plan for regulatory consultation	J Martin Hansen Bailey	D Munro Hansen Bailey	C White BMC
1	30/04/13	-	Approved Blast Management Plan	J Martin Hansen Bailey	D Munro Hansen Bailey	A Harburg BMC
2	01/09/15	-	Update for SSD-5170	D Munro Hansen Bailey	C Annandale Hansen Bailey	C White BMC
3	02/02/16	-	BMP Update with comments from DP&E and EPA	N Dobbins Hansen Bailey	D Munro Hansen Bailey	C White BMC
4	18/07/16	-	Update for SSD-5170 (as modified) MOD 1 & MOD 2	D Munro Hansen Bailey	D Munro Hansen Bailey	C White BMC
5	11/05/17	18/08/17	Update for SSD-5170 (as modified) MOD 3	N Dobbins Hansen Bailey	D Munro Hansen Bailey	C White BMC

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1.0 INTRODUCTION

This section provides an introduction to the Bengalla Mine and this Blast Management Plan.

1.1 Background

Bengalla Mining Company Pty Limited (BMC) operates the Bengalla Mine (Bengalla), which is located approximately 4 km west of Muswellbrook in the Upper Hunter Valley, New South Wales (NSW). Bengalla is generally bound by Wybong Road to the north, Overton Road to the east, the Muswellbrook-Ulan Rail Line to the south and Roxburgh Road to the west (see **Figure 1**).

BMC was granted Development Consent for State Significant Development (SSD) 5170 on 3 March 2015 by the Secretary of the Department of Planning and Environment (DP&E) for the Continuation of Bengalla. SSD-5170 (as modified) enables BMC to continue open cut coal mining up to 15 Million tonnes per annum (Mtpa) of run of mine (ROM) coal until 2039.

This Blast Management Plan (BMP) has been developed in accordance with the requirements of Schedule 3, Condition 15 of SSD-5170 (as modified) to provide a framework for the management of blasting at Bengalla.

1.2 History of Operations

1.2.1 Introduction

BMC was originally granted Development Consent Development Application (DA) 211/93 in 1996 to construct and operate an open cut coal mine and associated activities in accordance with the supporting document *Bengalla Mine Environmental Impact Statement* (HLA Envirosciences, 1993). Mining operations at Bengalla commenced in 1998.

1.2.2 State Significant Development 5170

In September 2013, BMC sought a new development consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to enable mining operations to continue at Bengalla. The application was supported by the '*Continuation of Bengalla Mine Environmental Impact Statement*' (Bengalla EIS) (Hansen Bailey, 2013) as modified by the *'Continuation of Bengalla Mine Response to Submissions'* (RTS) (Hansen Bailey, 2014).

On 3 March 2015, the Secretary of DP&E as delegate of the Minister for Planning granted SSD-5170 (as modified) which permits the following activities at Bengalla:

- Open cut mining towards the west at a rate of up to 15 Mtpa ROM coal until 2039;
- Continued use of the existing dragline, truck fleet and excavators;
- An out of pit Overburden Emplacement Area (OEA) to the west of Dry Creek which may be utilised for excess spoil material until it is intercepted by mining;

- Various upgrades, relocations or additional new infrastructure to support the Project;
- Processing, handling and transportation of coal via the (upgraded) Coal Handling and Preparation Plant (CHPP) and rail loop for export and domestic sale;
- Continued rejects and tailings co-disposal in the Main OEA and temporary in pit reject emplacement;
- Relocation of a 6 km section of Bengalla Link Road at approximately Year 15 near the existing mine access road to facilitate coal extraction;
- The diversion of Dry Creek via dams and pipe work with a later permanent alignment of Dry Creek through rehabilitation areas when emplacement areas are suitably advanced;
- Relocation of water storage infrastructure as mining progresses through existing dams (including the Staged Discharge Dam and Hunter River Raw Water Dam); and
- A workforce of approximately 900 full time equivalent personnel (plus contractors) at peak production.

The approved operations' layout is presented in **Figure 2**.

1.2.3 Bengalla Development Consent – Modification 1

SSD-5170 (as modified) was modified on 16 December 2015 by the Executive Director – Resource Assessments and Compliance for the DP&E (as delegate of the Minister for Planning) for the activities largely described in the '*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2015a) (MOD 1 SEE). The MOD 1 SEE provides approval for the following:

- Alterations to various water management infrastructure components including:
  - Utilisation of the Satellite Pit as a temporary mine water catchment dam;
  - Relocation of the Staged Discharge Dam and the Hunter River Salinity Trading Scheme (HRSTS) staged discharge release point;
  - Construction of clean water diversion levees in locations other than those already approved; and
  - Revised locations for the proposed relocation of the Hunter River Raw Water Dam and Washery Dam;
- Additional locations for the siting of the Explosives Storage Facility; and
- Placement of fill from the excavation of the Dry Creek Clean Water Dam (CW1) adjacent to it.

No additional conditions pertaining to blast management were included in SSD-5170 (as modified) as a result of the MOD 1 SEE.

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BENGALLA MINE

Regional Locality

FIGURE 1

1.2.4 Bengalla Development Consent – Modification 2

SSD-5170 (as modified) was modified on 1 July 2016 by the Director – Resource Assessments for the DP&E as delegate of the Minister for Planning for the activities largely described in the '*Bengalla Mine Development Consent Modification Statement of Environmental Effects*' (Hansen Bailey, 2016) (MOD 2 SEE). The MOD 2 SEE provides approval for the following:

- Alterations to the approved height of the Main OEA to improve visual amenity from primary viewing locations in and surrounding the township of Muswellbrook and Denman Road, in two selected locations (Visual Relief Areas):
    - The Northern Relief Area constructed to a maximum height of Reduced Level (RL) 300; and
    - The Southern Relief Area constructed to a maximum height of RL 290.
- Establishment of a new gravel access road from Wybong Road to the Dry Creek Diversion Project Construction Site Office being a former homestead (Homestead Access).

No additional conditions pertaining to blast management were included in SSD-5170 (as modified) as a result of the MOD 2 SEE.

1.2.5 Bengalla Development Consent – Modification 3

SSD-5170 was modified on 23 December 2016 (MOD 3) by the Director – Resource Assessments for the DP&E as delegate of the Minister for Planning for the activities largely described in the 'Bengalla Mine Development Consent Modification 3 Statement of Environmental Effects' (Hansen Bailey, 2016) (MOD 3 SEE). The MOD 3 SEE provides approval for the repositioning of the following approved activities:

- The construction and operation of an explosives facility and reload facility, which may be relocated to another location(s) within the Approved Disturbance Boundary at a later time;
- The alignment of the Hunter River pipeline; and
- The emplacement and use of temporary topsoil stockpiles during the mining process.

No additional mitigation and management measures to that within SSD-5170 (as modified) are required to manage any potential blasting impacts resulting from MOD 3. As such, no additional conditions pertaining to blast management were included in SSD-5170 (as modified) as a result of the MOD 3 SEE.

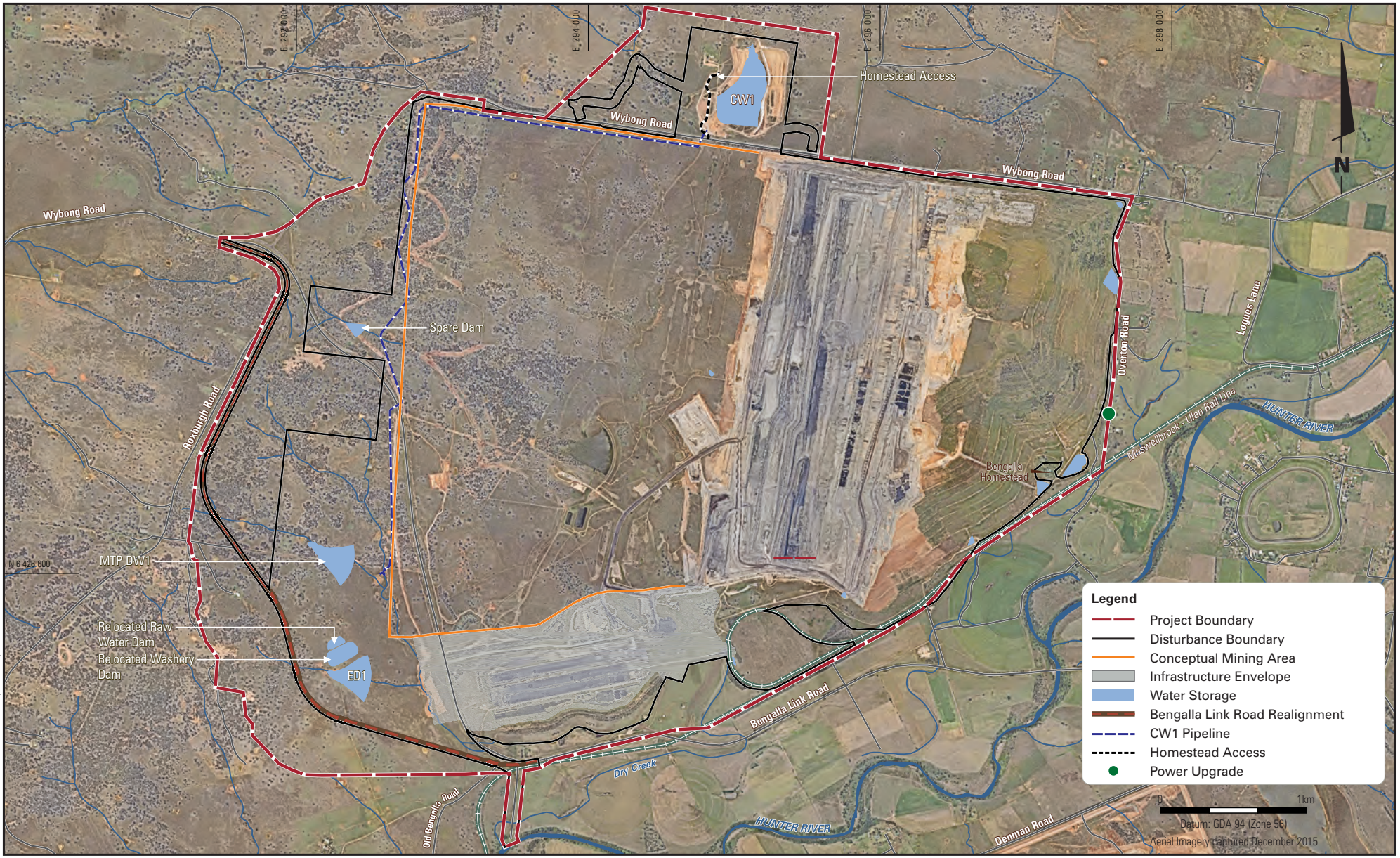
The development layout is presented in **Figure 2**.

1.2.6 Prescribed Dams

The following dams at Bengalla are prescribed under the *Dams Safety Act 2015*:

- Staged Discharge Dam (SDD); and
- Clean Water Dam 1 (CW1).

The Dam Safety Committee (DSC) approved mining activities within the Notification Areas of SSD and CW1 in correspondence dated 31 August 2015. In accordance with the recommendations of the Dam Safety Committee (DSC), BMC first prepared a DSC Management Plan (revised May, 2016) in consideration of '*Mining Near Prescribed Dams Management and Monitoring Matters*' (DSC, 2010). BMC will undertake proper operation and maintenance of the prescribed dams, including blast monitoring and management of blast impacts.



HB BENGALLA MOD 3 1639 F2 Development Layout 22 11 2016

BENGALLA MINE

Conceptual Development Layout

FIGURE 2

1.3 Plan Objectives

This BMP sets out the procedures for the management of blasting within the Project Disturbance Boundary (as illustrated on **Figure 2**). This BMP has been developed in accordance with the relevant conditions of SSD-5170 (as modified) and the Bengalla EIS in relation to blasting. Specifically, the objectives of this BMP are to:

- Describe the measures that would be implemented to ensure compliance with blast criteria and operating conditions;
- Describe the proposed blasting management system;
- Includes a blast monitoring program that:
    - Uses real-time monitors to evaluate the performance of the development against the blasting criteria;
    - Evaluates and reports on:
        - The effectiveness of the blasting management system;
        - Compliance with the blasting operating conditions;
    - Defines what constitutes a blasting incident and includes a protocol for identifying and notifying DP&E and relevant stakeholders of any blasting incidents; and
- Maintain an effective response mechanism for dealing with issues and complaints related to blasting.

1.4 Management Plan Statutory Requirements

1.4.1 SSD-5170 Performance Measures

Appendix A (Table A-1) outlines the blasting management performance measures in accordance with various conditions in SSD-5170 (as modified) and indicates where each is addressed in this BMP.

The specific requirements for this BMP are provided in Schedule 3, Condition 15 of SSD-5170 (as modified) and are listed in **Table 1**, and where each is addressed within this BMP.

1.4.2 EIS Commitments

Appendix A (Table A-2) lists the blasting commitments made in the Bengalla EIS and indicates where each is addressed in this BMP.

Table 1
Blast Management Plan Requirements

Ref	Requirement	BMP Section
Condition 15	The Applicant must prepare and implement a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:	This BMP
	(a) be prepared in consultation with the EPA and Council, and submitted to the Secretary for approval within 6 months of the date of this consent;	**2.0**
	(b) describe the measures that would be implemented to ensure compliance with the blasting criteria and operating conditions of this consent;	**4.0**
	(c) propose and justify any alternative ground vibration limits for any public infrastructure in the vicinity of the site (if relevant); and	N/A
	(d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions.	**3.0, 6.1 and 6.4.1**

1.5 Document Structure

This BMP is structured as follows:

- **Section 1** provides background information on Bengalla, describes Bengalla and its history, outlines the objectives of this BMP and describes the environmental management regime for Bengalla;
- **Section 2** discusses stakeholder engagement in relation to blasting and blast management at Bengalla;
- **Section 3** outlines the blast monitoring program at Bengalla;
- **Section 4** outlines the blast management measures and controls at Bengalla;
- **Section 5** provides detail on the Bengalla Road Closure Management Plan;
- **Section 6** provides information on blasting reporting and auditing;
- **Section 7** outlines a summary of responsibilities as stipulated in the BMP; and
- **Section 8** provides references used throughout the BMP.

2.0 STAKEHOLDER ENGAGEMENT

This section provides a summary of regulatory consultation undertaken as part of the development of this BMP.

2.1 2015 BMP

Schedule 3, Condition 15 of SSD-5170 (as modified) requires that this BMP must be developed in consultation with the Environment Protection Authority (EPA) and Muswellbrook Shire Council (MSC) to the satisfaction of the Secretary of DP&E. A discussion in relation to the consultation completed with each agency is provided below.

A copy of the draft BMP was provided to DP&E, EPA and MSC on 3 September 2015 for review and comment. All regulatory correspondence is included in **Appendix B**.

2.1.1 Environment Protection Authority

The EPA provided correspondence on 9 October 2015 in relation to the draft 2015 BMP. The EPA advised they did not have any changes.

2.1.2 Muswellbrook Shire Council

No comments were received from MSC as at 18 July 2016.

2.1.3 Department of Planning and Environment

Comments on the draft 2015 BMP were received from DP&E on 8 October 2015 and have been incorporated. The final 2015 BMP was approved by DP&E.

2.1.4 Bengalla Community Consultative Committee

The Bengalla Community Consultative Committee (CCC) will continue to be consulted in accordance with the requirements of the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007) (or the latest version).

2.2 2016 BMP

Relevant to this BMP, SSD-5170 (as modified) Schedule 5, Condition 5 states:

> *"5. Within 3 months of submission of:*
>
> *(d) Any modification to the conditions of this consent (unless conditions require otherwise), the applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Secretary.*

Where this review leads to revisions of any such document, then within 4 weeks of the review, unless the Secretary agrees otherwise, the revised document must be submitted to the Secretary for approval."

Correspondence was provided by DP&E on 24 May 2016 indicating that with consideration of BMC's recent modification application (i.e. MOD 2 SEE provided on 15 April 2016), the Water Management Plan and the Aboriginal Cultural Heritage Management Plan are required to be submitted prior to undertaking disturbance associated with the activities approved under MOD 1, where the activities are not shown in the approved plan. Remaining management plans associated with the update for the Bengalla MOD 1 SEE are required to be submitted "*…to the Department within one month of determination of the current Modification 2 application…".*

A copy of the 2016 BMP was provided to DP&E on 27 July 2016 for review and approval. As of 9 May 2017, no correspondence has been received from DP&E with regards to that document.

A copy of all relevant regulatory correspondence associated with the preparation of the 2016 BMP is provided in **Appendix B**.

2.3 2017 BMP

This review was undertaken to address MOD 3 and to consider blast monitoring requirements for prescribed dams as outlined in the DSC Management Plan. **Appendix B** includes DP&E correspondence including confirmation of a due date of 12 May 2017. A copy of the 2017 BMP was provided to DP&E on 11 May 2017 for review and approval.

A copy of all relevant regulatory correspondence associated with the preparation of this BMP is provided in **Appendix B**.

3.0 BLAST MONITORING

BMC is required to undertake a blast monitoring program to evaluate the performance of Bengalla blasting operations against relevant blast criteria. Blast monitoring is undertaken at 11 real time blast monitors as shown on **Figure 3** and **Table 2**.

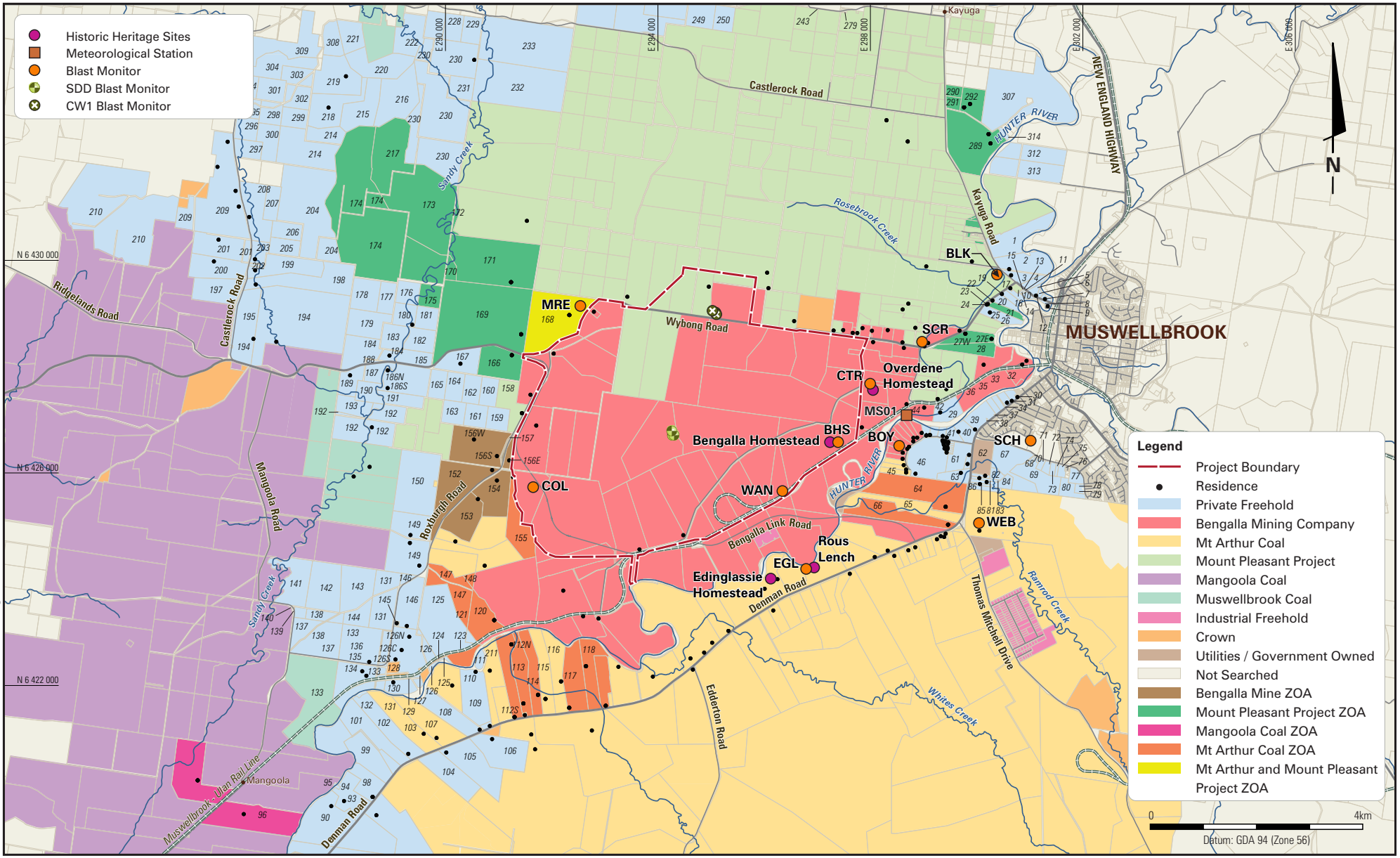
The blast monitors record the following characteristics for each blast and relay the information live to an external website (or other equivalent supplier) and via SMS to BMC Environmental staff:

- Time and date;
- Peak vector sum (mm/s);
- Air blast overpressure peak (dBLin Peak); and
- Waveform trace, where applicable.

Calibration and maintenance of monitoring equipment is carried out by a specialised blast monitoring service provider. Instrumentation used to measure and record the blast vibration and overpressure levels meets the requirements of Australian Standard 2187.2:206 *Explosives – Storage and use – Use of explosives.*

Table 2
Fixed Blast Monitoring Locations

Site Reference	Site Location	Coordinates (MGA 94, z56)	
		Easting	Northing
Non-Mine Owned Land			
COL	Collins Residence	291645	6425854
MRE	Moore Residence	292512	6429127
CTR	Carter Residence	297790	6427759
SCR	Scriven Residence	298417	6428558
BLK	Blake Residence	300110	6429756
SCH	St James School	300728	6426715
Mine Owned Land			
WEB	Webber Residence	299779	6425218
BOY	Boyle Residence	298319	6426612
BHS	Bengalla Homestead	297109	6426747
EGL	Edinglassie Residence	296595	6424367
WAN	Wantana Area	296273	6425833



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BENGALLA MINE

Blast Monitoring Network

FIGURE 3

3.1 Monitoring of Historic Heritage Sites

In accordance with Schedule 3, Condition 32(b) of SSD - 5170, BMC is required to monitor, notify and manage the effects of blasting on historic heritage items.

Ground vibration and overpressure impacts were considered unlikely to exceed criteria at items of historic heritage significance as outlined in the Bengalla EIS. A brief description of historic heritage sites, their listed significance and monitoring undertaken is shown in **Table 3**. The locations of all historic heritage sites are shown on Figure 3 of the Historic Heritage Management Plan.

It was noted in the Bengalla EIS that as mining progresses to the west, items of historic heritage will be further away from active mining and will be subject to lower vibration and overpressure levels than previously experienced.

Historic heritage blast monitoring locations are shown on **Figure 3** and listed in **Table 3**. Any impact to items of historic heritage including exceedance of blasting criteria will be reported in accordance with the protocol outlined in **Section 6.4.1**.

Table 3
Bengalla Historic Heritage Sites and Blast Monitoring

Site Name	Listed Significance	Within Disturbance Boundary	Site Description	Distance to Project (m)	Monitoring
Located within the Project Boundary					
Bengalla Homestead	Local	No	Homestead buildings: the 1877 building, 1895 extension and the 1960s additions combined with gardens, outbuildings, tennis court, farm sheds and archaeological sites	1,600	• Blast monitoring at location BHS (refer to **Figure 3**) • Annual dilapidation survey
House Site 1	Not Listed	Yes	The site consists of a flat area, a septic tank and above ground concrete tank	N/A	• Directly impacted, no monitoring required
House Site 2	Not Listed	Yes	The site consists of a flat area scattered with bricks and timber	N/A	• Directly impacted, no monitoring required

Site Name	Listed Significance	Within Disturbance Boundary	Site Description	Distance to Project (m)	Monitoring
House Site 3	Not Listed	No	Concrete slabs mark the location of the house and a dairy Ceramic and bricks nearby provide an approximate date of the late 19th century	360	• No blasting impacts predicted* due to nature of the site • Annual inspection to confirm no impact as predicted in the EIS
Stockyard	Not Listed	Yes	The stockyard, constructed of post and rails, is centred on a long run, terminating in a loading ramp Probably constructed in the late 19th or early 20th century	N/A	Stockyard Archival Photographic Recording completed December 2016 (prior to impacts).
Located in the vicinity of the Project Boundary					
Keys Family Private Cemetery	Local and Regional	**No**	Contains ten funerary monuments (stone altar type markers, obelisks and marble headstones) enclosed by a fence constructed of timber and chicken wire, with a metal swinging gate	1,100	• No blasting impacts predicted* due to distance • Annual inspection to confirm no impact as predicted in the EIS
Dalama Stud (Old Bengalla)	Local	**No**	A stone and brick retaining wall in a state of ruin. The wall has been identified as the rear wall of a kitchen and bathroom complex dating from as early as the 1840s A timber, structure with a corrugated iron roof is also present and was possibly once the stable and coach house associated with Old Bengalla	1,100	• No blasting impacts predicted* due to distance • Annual inspection to confirm no impact as predicted in the EIS

Site Name	Listed Significance	Within Disturbance Boundary	Site Description	Distance to Project (m)	Monitoring
Overdene	Local and National^	**No**	Overdene is a modest sized sandstone house in the classic Georgian style, with the curtilage defined by a fence	2, 150	• Blast monitoring will be undertaken at location CTR (refer to **Figure 3**) • Annual dilapidation survey
Blunt's Butter Factory	Local	**No**	Concrete foundations, fragmentary portions of walls and rubble are all that remain of the Factory Some of the remaining concrete sections have glazed white tiles attached	2, 150	• No blasting impacts* due to distance • Annual inspection to confirm no impacts from blasting
Edinglassie Homestead **	State	**No**	Two storey sandstone house with hipped iron roof in simplified Italianate style with outbuildings (service wing/kitchen, stables, meat house, killing shed and dovecote). Construction was in two stages (c1880 and c1895) (Archaeology Australia, 2008)	1,900	• Blast monitoring will be undertaken at location EGL (refer to **Figure 3**)
Rous Lench**	State	**No**	Low cottage homestead of rendered brick/sandstone and corrugated iron roof in Italianate style (Archaeology Australia, 2008)	2,100	• Blast monitoring will be undertaken at location EGL (refer to **Figure 3**)

**As outlined in the Bengalla EIS*

***MAC owned*

3.2 Monitoring of Prescribed Dams

As outlined in **Section 1.2.6**, the SDD and CW1 are prescribed dams. Prior to blasting, a risk assessment is prepared to consider the locations of the SSD and CW1 and determine the appropriate "exclusion zone" for personnel and infrastructure, which is generally 500 m and 300 m respectively.

Staged Discharge Dam

There are three blast monitors (see **Figure 3**) located adjacent to the SDD on the abutment nearest mining, the embankment crest (at maximum height section) and embankment downstream toe (at maximum height section). The blast monitors record data for each blast which triggers relevant threshold levels and relays information live to a supplier's website.

Clean Water Dam 1

Figure 3 indicates the three blast monitors located on the embankment crest (at maximum height section) and embankment downstream toe (at maximum height section). The blast monitors record data for each blast which triggers relevant threshold levels and relays information live to a supplier's website.

4.0 BLAST MANAGEMENT MEASURES

BMC has a commitment to minimise potential environmental impacts from its operations, using proactive and reactive control measures and monitoring tools. Blast management practices at Bengalla are described below.

4.1 Blasting Criteria

SSD-5170 (as modified) Schedule 3, Condition 8 lists blasting criteria for overpressure and vibration at privately owned residences as reproduced in **Table 4**. These criteria do not apply if BMC has a written agreement with the relevant owner for higher levels, and BMC has advised DP&E of the terms of this agreement.

The Bengalla EIS predicted that blast overpressure and vibration at relevant heritage items would not exceed the relevant criterion of 10 mm/s or 120 dBL from BMC's blasting activities. The locations of mine-owned heritage sites (i.e. BMC owned Bengalla Homestead and Overdene Homestead and Mt Arthur Coal (MAC) owned Edinglassie Homestead and Rous Lench Homestead) are shown on **Figure 3**.

Table 4
Blasting Criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Residence on privately owned land [a]	115	5	5% of the total number of blasts over a period of 12 months*
	120	10	0%
Staged Discharge Dam**	-	50	Nil
Clean Water Dam 1	-	100***	Nil

** 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.*
*** Staged Discharge Dam is prescribed under the Dams Safety Act, 2015.*
**** As outlined in Section 2.2.2 of the Bengalla DSC Management Plan (May, 2016)*

4.2 BMC Environmental Management System

BMC has an Environmental Management System (EMS) in place to fulfil its commitment to environmental management and community engagement. The EMS is comprised of environmental procedures and standards for particular aspects and impacts of its operations. Procedures and standards are regularly reviewed and audited as part of the continuous improvements of Bengalla's EMS to adopt relevant industry best practice and technology.

BMC will continue to operate in accordance with relevant requirements during and following mine closure to ensure environmental (including monitoring and management) and social responsibilities are met.

4.3 Regulatory Control Measures

Blasting activities are conducted in accordance with SSD-5170 (as modified) Schedule 3, Conditions 8-15 (see **Appendix A**). Measures to minimise impacts from blasting activities and ensure compliance with relevant requirements include:

- Blasting is conducted on site between 7 am and 5 pm, Monday to Saturday inclusive. No blasting occurs on Sundays, public holidays, or at any other time without the written approval of the Secretary;
- Blasting frequency does not exceed a maximum of two blasts per day and six blasts per week when averaged over a calendar year (this does not include blasts that generate a 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, its workers or the general public);
- 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. Should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast. In circumstances of recurring unfavourable weather conditions (following planned but not completed blast events), to avoid excess explosive sleep times and minimise any potential environmental impacts, BMC may seek agreement from the Secretary for additional blasts to be fired on a given day;
- Consideration is given to the frequency and duration of road closures and avoidance of road closures during peak traffic periods (including where practical, to occur at times which do not impede school bus operations);
- In accordance with SSD-5170 (as modified) Schedule 3, Condition 13, implement best management practice to:
    - protect the safety of people and livestock in the surrounding area;
    - protect public or private infrastructure/property in the surrounding area from any damage;
    - minimise the dust and fume emissions of any blasting; and
    - ensure that blasting on site does not damage historic heritage sites;
- Public roads within 500 m of blast sites will be closed during the blast and until they are clear of dust and fumes in accordance with the Road Closure Management Plan in **Section 5.0**;
- Conduct blast property investigations in accordance with SSD-5170 (as modified) Schedule 3, Conditions 11 and 12 as described in **Section 6.9**;
- Coordinate blast times with MAC and Mount Pleasant Project (when operating);

- Operate a 'Blasting Hotline' (02 6542 9591) which provides the community with daily blast times and locations;
- Operate a blast SMS notification service which:
    - Provides details of the upcoming blast (including date and approximate time) and sends an update if a blast has been delayed or cancelled;
    - Is offered to all persons currently identified on the Blast Notification List and will be provided to any community member who registers for the service;
    - Details of the blast SMS notification service will be communicated to the BMC CCC; and
- Fume generation is managed in accordance with the approved Blast Fume Management Plan (as modified).

4.4 Blast Design

Blasts are designed using best practice techniques to contain the blast and minimise overpressure, vibration and fume, consistent with SSD-5170 (as modified) Schedule 3 Condition 8.

Techniques utilised at BMC include:

- Identification of infrastructure within 500 metres of the blast;
- Maximum Instantaneous Charge contained to a level so that blasting that will comply with the criteria detailed in **Section 4.1;**
- Stemming, a delay detonation system and careful drilling and hole loading as per the blast design;
- Monitoring of airblast and ground vibration;
- Post blast review of monitoring results, where appropriate, and modification of future blast designs, if necessary;
- Periodic review of blast management practices to evaluate performance and identify responsive action or system improvements, if required; and
- Account for any adverse meteorological conditions that may be prevailing at the time of the blast and defer or modify the blast to accommodate those conditions where appropriate (as detailed in **Section 4.5**).

4.5 Weather Conditions

Blasting operations are assisted by the 'Blasting Permission System' which integrates real-time meteorological information (wind speed, inversion strength and wind direction). During blast scheduling, consideration is given to the size and design of the blast relative to extremities of the mining areas, neighbours, material type, expected dust and/or blast fume generation potential, sleep time and hot or reactive ground.

Prior to a scheduled blast, the Bengalla Environment staff check the daily weather forecast, which provides hourly predictions of meteorological conditions. Blasting should not be conducted if weather conditions are not within acceptable meteorological limits.

4.5.1 Process

The following process is followed:

At least 1 hour prior to scheduled blast time:

- Meteorological information is checked for wind speed, wind direction and temperature inversion conditions before preparing to fire the blast. These conditions should be monitored if conditions are close to the risk limits set by the site.

Approximately two minutes prior to the scheduled blast time:

- Shotfirer to reconfirm meteorological conditions.

If a blast needs to be delayed:

- Notify relevant supervisor and Superintendent Dragline Drill and Blast; and
- If delay will extend beyond licence time limit, then procedures for postponing tied shots should be followed.

If a blast cannot be delayed due to sleep time duration or other factors:

- The relevant regulator will be notified of the circumstances of the blast.

If a blast will occur outside of the approved blast times:

- BMC will obtain regulatory approval from DP&E prior to any blasting outside of the approved hours under SSD-5170 (as modified).

5.0 ROAD CLOSURE MANAGEMENT PLAN

This section outlines the land and infrastructure potentially affected by blasting at Bengalla, and details on the Bengalla Road Closure Management Plan.

5.1 Blasting within 500 m of Private Land

SSD-5170 (as modified) Schedule 3, Condition 14(c) states that no blasting will be undertaken within 500 m of any land outside the site that is not owned by BMC unless:

- A written agreement is in place which allows blasting to be carried out closer to the land and DP&E has been advised in writing; or
- BMC has demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the infrastructure or land without compromising the safety of people or livestock, or damaging buildings and/or structures; and
- Updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land.

The only private landholder within 500 m of Bengalla's approved 24 year blast area is Receiver 168 as shown on **Figure 3**. This property is presently not within 500 m of the approved Bengalla 24 year blast area and is not anticipated to be so until approximately Year 20. Receiver 168 is also located in both Mt Arthur Coal's and the Mount Pleasant Project's zone of affectation for noise and/or dust and as such also has acquisition rights upon request from those operations.

5.2 Other Mine Owned Land

SSD-5170 (as modified) Schedule 3, Condition 14(c) states that no blasting will be undertaken within 500 m of any land outside the site that is not owned by BMC unless:

- A written agreement is in place which allows blasting to be carried out closer to the land and DP&E has been advised in writing; or
- BMC has demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the land without compromising the safety of people or livestock, or damaging buildings and/or structures; and
- Updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land.

Mine-owned land (MACH Energy) as part of the Mt Pleasant Project is within 500 m of proposed blast activities for the 24 year project life of Bengalla. BMC will implement the procedure undertaken for the closure of public roads as described in **Section 5.4** for blasts within 500 m of MACH Energy owned land.

5.3 Muswellbrook-Ulan Rail Line Closure

SSD-5170 (as modified) Schedule 3, Condition 14(b) states that no blasting will be undertaken within 500 m of the Ulan-Muswellbrook Rail Line unless a written agreement is in place which allows blasting to be carried out closer to the infrastructure and DP&E has been advised in writing. BMC currently has a Blasting Deed dated 6 April 2009 in place with the Australian Rail Track Corporation that facilitates blasting within 500 m of the Muswellbrook-Ulan Rail Line, which will be updated as required.

5.4 Closure of Public Roads

BMC will continue to implement the existing Road Closure Management Plan as described below. This document describes the procedures for the closure of any public road situated within 500 m of blasting as required under SSD-5170 (as modified) Schedule 3, Condition 14(a).

Public roads potentially within 500 m of blasting operations include Bengalla Link Road and Wybong Road. Public road closures will be conducted in accordance with BMC's Closure of Public Roads for Blasting (PRO-0001), which is presented in full in **Appendix C**. Key actions associated with the road closure procedure are presented in **Table 5**.

Table 5
Road Closure Actions and Schedule

When	Action	Responsibility
In the week prior to blasting	Notification of the time and date for the scheduled blast requiring public road closure(s) will be provided to Muswellbrook Shire Council via their website. Emergency services including Muswellbrook Fire Brigade, Rural Fire Service, Ambulance Service, Police and State Emergency Service will also be advised of planned road closures.	Blasting Coordinator
One working day prior to blasting	Confirm the scheduled time and date for the blast on the MSC website.	Blasting Coordinator
	Time signs will be posted facing both directions along the public road scheduled to be closed, displaying the planned closure date and time for the next blast (see **Plate 1**).	Blasting Coordinator
The day of blasting	Confirm the scheduled date and time of the blast with personnel identified on the Blast Notification Form and update the MSC website (if required).	Blasting Coordinator
	30 minutes prior to blasting, confirmation of the firing time will be provided to the Blasting Coordinator.	Shotfirer
	30 minutes prior to blasting, all temporary traffic control signposting will be in place (see Figure 2 and Figure 3 of **Appendix C**). Locations of signposts will be routinely adjusted to reflect the progression of mining.	Blasting Coordinator
	Blasting will not take place at times when adverse environmental conditions would make road closure hazardous including heavy rain, fog, smoke etc. A decision in relation to the environmental conditions will be made prior to closure of any public road.	Blasting Coordinator

When	Action	Responsibility
	At least 10 minutes prior to blasting, sentries will be positioned along the public roads (see **Plate 2**). Sentries will ensure that vehicle stop points are manned to prevent traffic entering the blast exclusion zone until after the blast has been fired and the area deemed safe by the Blasting Coordinator.	Blasting Coordinator
	Two minutes prior to blasting, when confirmation has been received from the Blasting Coordinator that the blasting area within the sentries is all clear, the Shotfirer will initiate the two minute warning at the commencement of normal blasting procedures.	Shotfirer
	One minute after blasting, the Shotfirer will instruct the Blasting Coordinator to inspect the public road for any post blast fumes, dust, debris or damage.	Shotfirer and Blasting Coordinator
	If there is no evidence of post blasting fumes, dust, debris or damage the Blasting Coordinator will notify the Shotfirer who will then give permission to re-open the public road.	Shotfirer and Blasting Coordinator
	If there is evidence of post blast fumes or dust that is predicted to impact on queued traffic, then the Blasting Coordinator will advise the closest sentry to divert traffic or reopen the road to ensure there are no unnecessary impacts.	Blast Coordinator
	If there is evidence of debris or damage then the Blasting Coordinator will notify the Shotfirer of such debris or damage. The sentries on the public road will hold the 'stop' position and delay through traffic until such stage as the debris is removed, damage is repaired or controlled traffic conditions put in place. Not until this has been completed will the Shotfirer give permission to re-open the public road. MSC will be notified if damage to the road is confirmed to be as a direct result of damage arising from blasting activities at Bengalla.	Shotfirer and Blasting Coordinator
	Once the road inspection has been completed and has been deemed safe to reopen the Blasting Coordinator will then remove the temporary barriers from across the public road, and the sentries will remain in position with the "SLOW" sign displayed.	Blasting Coordinator

Plate 1
Road Closure Sign

Plate 2
Traffic Control Sentry

6.0 REPORTING & AUDITING

This section outlines reporting and complaints management relevant to this BMP. This section also describes the auditing requirements at Bengalla.

6.1 Annual Review

By the end of March each year, BMC will provide an Annual Review to the Secretary of DP&E, which will review the environmental performance of Bengalla for the previous calendar year. The Annual Review will include the presentation and analysis of monitoring results, complaints and any management actions implemented at Bengalla over the reporting period. This will include a summary of blast monitoring results and discussion on exceedances and subsequent year of operations.

The Annual Review will be made publicly available through placement on BMC's website, and will be provided to the Bengalla CCC.

6.2 Auditing

Within one year of the commencement of development under SSD-5170 (as modified) (i.e. 1 October 2016) and every three years thereafter, unless the Secretary directs otherwise, BMC will commission and pay the full cost of an Independent Environmental Audit of Bengalla. The audit report will be placed on BMC's website.

6.3 Blast Plan Review

SSD-5170 (as modified) Schedule 5, Condition 5 requires that within three months of the submission of the following documents, BMC must review, and if necessary, revise the BMP in consultation with the EPA and MSC to the satisfaction of the Secretary of DP&E:

- Annual Review in accordance with Schedule 5, Condition 4;
- Incident report under Schedule 5, Condition 7;
- Audit report under Schedule 5, Condition 9; or
- Modification to the conditions of SSD-5170 (unless the conditions require otherwise).

Should the Bengalla Mining Operations Plan (MOP) be updated to include any changes relevant to this BMP then this will also trigger the requirement to update this BMP in consultation with the EPA and MSC to the satisfaction of the Secretary of DP&E.

When a BMC review leads to revision of the BMP, then within four weeks of the review, unless the Secretary agrees otherwise, the revised BMP must be submitted to the Secretary for approval.

This BMP may also be reviewed and, if necessary, revised to the satisfaction of the Secretary of DP&E where there are changes to the monitoring program as a result in changes in mine development, blasting management practices or incident investigations.

6.4 Exceedance of Criteria

SSD-5170 (as modified) Schedule 5, Condition 3 requires BMC to prepare a protocol to manage and report exceedances of the blast criteria listed in this BMP to the relevant regulatory agencies. An exceedance in criteria will trigger the response plan and reporting outlined below.

6.4.1 Protocol for Determining Exceedances

Where monitoring results are below the blast criteria, no further action is required and results are reported with no additional analysis.

Where results are above the blast criterion, the following analysis will be used to determine if BMC's activities exceeded the criteria or contributed to an exceedance of the criteria:

- Confirm that the monitoring results are valid and attributable to a BMC blast;
- Investigate the meteorological data for the relevant period and the design of the blast; and
- Assessment of the blast in accordance with the incident reporting procedure in **Section 6.5**.

Any exceedances are recorded on the Bengalla Health, Safety & Environmental Incidents Register.

Preparation of an incident response plan may require the assistance of a specialist blasting consultant.

6.4.2 Contingency Plan

If recorded overpressure or vibration consistently approach or exceed the relevant blast criteria, additional blasting control measures may be investigated and implemented where required.

Although ground vibration and overpressure impacts are considered unlikely to exceed criteria at items of historic heritage significance, annual dilapidation surveys will be undertaken at the Bengalla and Overdene Homesteads, as required by the Conservation Management Plans. Any defects or damage caused through blasting will be rectified and reported in the Annual Review.

Blasting operations will be modified until a return to an acceptable range and/or the source of the exceedance is determined and managed.

6.5 Reporting an Incident

6.5.1 Regulatory Agencies

SSD-5170 (as modified) Schedule 5, Condition 7 requires BMC to report any incident that has caused, or threatens to cause material harm to the environment; and/or breaches or exceeds the blast criteria in the consent.

BMC must immediately notify the Secretary of the DP&E and any other relevant regulatory agencies (including the EPA in accordance with EPL 6538, or the DSC for prescribed dams) of any incident as defined above. Within 7 days of the date of the incident, BMC will provide a detailed report on the incident, and such further information as may be requested.

6.6 Complaints

BMC has a Community Complaints Procedure which details how to receive, respond to, record and address community complaints including blasting related issues. BMC will keep a record of all community complaints and subsequent actions. At least the following details are recorded:

- Complainant details (where provided);
- The nature of the complaint;
- How the complaint was made;
- Actions (if appropriate); and
- Consultation undertaken.

Complaints and enquiries regarding blasting issues and any other environmental matters should be directed to the 24 hour complaints hotline: 1800 178 984. A register of complaints will be published monthly on BMC's website in accordance with Schedule 5, Condition 11 of SSD-5170 (as modified).

6.7 Continuous Improvement

BMC continually strives to improve Bengalla's environmental performance by applying the principles of reasonable and feasible new best practice technologies. These measures will be investigated and adopted where relevant and the effectiveness of blast management measures on site will continue to be monitored.

6.8 Public Access to Information

In accordance with SSD-5170 (as modified) Schedule 5, Conditions 8 and 11, BMC will regularly (in the form of the Annual Review) prepare a summary of monitoring results required by SSD-5170 (as modified) (including for blasting overpressure and vibration) and make these publicly available on the Bengalla website. This BMP will be made publicly available on the BMC website.

6.9 Property Inspections

Should BMC receive a written request from the owner of any privately owned land within 3 km of the approved open cut mining pit, BMC will undertake a structural inspection of the land in accordance with the requirements of SSD-5170 (as modified) Schedule 3, Conditions 11-12.

7.0 RESPONSIBILITIES

Table 6 provides a summary of responsibilities as stipulated in this BMP.

Table 6
Blasting Responsibilities Summary

Ref	Task	Responsibility	Timing
1	Provide adequate resources to implement the commitments in this BMP.	BMC General Manager	Ongoing
2	Provide training to relevant personnel in accordance with this BMP.	BMC Environment & Approval Specialist	Ongoing
3	Maintain the blast monitoring program as described in **Section 3.0**.	BMC Environment & Approval Specialist	Ongoing
4	Implement operational blast control measures as described in Section 4.0 to meet the blasting criteria in **Section 4.1**.	BMC Manager Operations	Ongoing
5	Undertake notifications to near neighbours as indicated in **Section 5.0**.	BMC Environment & Approval Specialist	As required
6	Organise inspection of historic heritage items to confirm no impacts from blasting (as outlined in **Section 3.1**)	BMC Environment & Approval Specialist	Annually
7	Provide notification to other landholders in accordance with **Section 5.0**.	BMC Environment & Approval Specialist	Ongoing
8	Undertake auditing and reporting (including complaints, exceedances and incidents) as per **Section 6.0**.	BMC Environment & Approval Specialist	As required

8.0 REFERENCES

- BMC (2012). *Post Blast Fume Generation Mitigation & Management Plan*.
- BMC (2013). *PRO-0001 Closure of Public Roads for Blasting.*
- BMC (2013). *Continuation of Bengalla Mine Environmental Impact Statement.*
- BMC (2016) *DSC Management Plan.*
- Department of Planning (2007). *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects*.
- Dam Safety Committee (2010). *Mining Near Prescribed Dams Management and Monitoring Matters.*
- Hansen Bailey (2016), *Bengalla Mine Development Consent Modification Statement of Environmental Effects* (SSD-5170 MOD 3).
- Hansen Bailey (2016), *Bengalla Mine Development Consent Modification Statement of Environmental Effects* (SSD-5170 MOD 2).
- Hansen Bailey (2015a*), Bengalla Mine Development Consent Modification Statement of Environmental Effects* (SSD-5170 MOD 1).
- Hansen Bailey (2015b), Bengalla Mine Development Consent Modification Response to Submissions.
- HLA Envirosciences (1993). *Bengalla Mine Environmental Impact Statement*.

APPENDIX A

SSD-5170 BLASTING REQUIREMENTS & BMC COMMITMENTS

Table A1
Blast Management Performance Measures

<table>
<tr><th>Ref</th><th>Performance Measure</th><th>BMP Section</th></tr>
<tr><td>Schedule 3, Condition 8</td><td>Blasting Criteria
The Applicant must ensure that blasting on the site does not cause exceedances of the criteria in Table 5.
Table 5: Blasting criteria
<table>
<tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="2">Residence on privately owned land [a]</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>115</td><td>5</td><td>5% of the total number of blasts over a period of 12 months</td></tr>
</table>
However, these criteria do not apply if the Applicant has a written agreement with the relevant owner for higher levels, and has advised the Department in writing of the terms of this agreement.</td><td>4.1</td></tr>
<tr><td>Schedule 3, Condition 9</td><td>Blasting Hours
The Applicant must only carry out blasting on site between 7 am and 5 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.</td><td>4.3</td></tr>
<tr><td>Schedule 3, Condition 10</td><td>Blasting Frequency
The Applicant must carry out a maximum of:
(a) 2 blasts a day; and
(b) 6 blasts a week, averaged over a calendar year, on the site.
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, blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.
Notes:
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.
For the avoidance of doubt, should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.
In circumstances of recurring unfavourable weather conditions (following planned but not completed blast events), to avoid excess explosive sleep times and minimise any potential environmental impacts, the Applicant may seek agreement from the Secretary for additional blasts to be fired on a given day.</td><td>4.3</td></tr>
<tr><td>Schedule 3, Condition 11</td><td>Property Inspections
If the Applicant receives a written request from the owner of any privately-owned land within 3 kilometres of the approved open cut mining pit on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection updated, then within 2 months of receiving this request the Applicant must:
(a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to:</td><td>6.9</td></tr>
</table>

Ref	Performance Measure	BMP Section
	• establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and • identify measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and/or structures; and (b) give the landowner a copy of the new or updated property inspection report. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Secretary for resolution.	
Schedule 3, Condition 12	**Property Investigations** If the owner of any privately-owned land claims that buildings and/or structures on his/her land have been damaged as a result of blasting on the site, then within 2 months of receiving this claim the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to investigate the claim; and (b) give the landowner a copy of the property investigation report. If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant must repair the damage to the satisfaction of the Secretary. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.	**6.9**
Schedule 3, Condition 13	**Operating Conditions** During mining operations on site, the Applicant must: (a) implement best management practice to: • protect the safety of people and livestock in the surrounding area; • protect public or private infrastructure/property in the surrounding area from any damage; and • minimise the dust and fume emissions of any blasting; (b) ensure that blasting on site does not damage historic heritage sites (see the figure in Appendix 6); (c) minimise the frequency and duration of any road closures, and avoid road closures for blasting during peak traffic periods; (d) operate a suitable system to enable the public and Council to get up-to-date information on the proposed blasting schedule on site and associated road closures; (e) co-ordinate the timing of blasting on site with the timing of blasting at the Mt Arthur and Mount Pleasant mines to minimise any cumulative blasting impacts; and (f) monitor and report on compliance with the relevant blasting conditions in this consent, to the satisfaction of the Secretary.	**4.3, 5.0 and 6.0**

Ref	Performance Measure	BMP Section
Schedule 3, Condition 14	The Applicant must not undertake blasting on site within 500 metres of: (a) any public road; (b) the Ulan – Muswellbrook railway line; or (c) any land outside the site that is not owned by the Applicant, unless: • the Applicant has a written agreement with the applicable infrastructure authority or landowner to allow blasting to be carried out closer to the infrastructure or land, and the Applicant has advised the Department in writing of the terms of this agreement; or • the Applicant has: o demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the infrastructure or land without compromising the safety of people or livestock, or damaging buildings and/or structures; and o updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the road or land.	**5.0**
Schedule 3, Condition 15	Blast Management Plan The Applicant must prepare and implement a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with the EPA and Council, and submitted to the Secretary for approval within 6 months of the date of this consent; (b) describe the measures that would be implemented to ensure compliance with the blasting criteria and operating conditions of this consent; (c) propose and justify any alternative ground vibration limits for any public infrastructure in the vicinity of the site (if relevant); and (d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions. The Applicant must implement the approved management plan as approved from time to time by the Secretary.	This BMP **2.0** **4.0** **4.1** **3.0**
Schedule 3, Condition 32	**Historic Heritage Management Plan** The Applicant must prepare and implement a Historic Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with the Heritage Branch and Council, and submitted to the Secretary for approval within 6 months of the date of this consent; (b) include the following for the management of other historic heritage on site: • conservation management plans for the Bengalla and Overdene homesteads; • measures to minimise the visual impacts of the development on the Edinglassie and Rous Lench Homesteads; and • a program/procedures for: o photographic and archival recording of potentially affected historic heritage items; o protection and monitoring of historic heritage items outside the project disturbance area;	**All addressed in HHMP (except as below)**

Ref	Performance Measure	BMP Section
	o monitoring, notifying and managing the effects of blasting on potentially affected historic heritage items; and o additional archival recording of any significant historic heritage items requiring demolition (including the Stockyard).	**4.1**
Schedule 5, Condition 3	**Management Plan Requirements** The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	**This BMP**
	(a) detailed baseline data;	**1.2**
	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	**1.4**
	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	**4.1**
	(d) a program to monitor and report on the: • impacts and environmental performance of the development; • effectiveness of any management measures (see c above);	**3.0 and 6.0**
	(e) a contingency plan to manage any unpredicted impacts and their consequences;	**6.4.2**
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	**6.7**
	(g) a protocol for managing and reporting any: • Incidents; • Complaints; • Non-compliances with statutory requirements; and • Exceedances of the impact assessment criteria and/or performance criteria; and	**6.5**
	(h) a protocol for periodic review of the plan. *Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*	**6.3**

Table A2
EIS Blast Management Commitments

Ref	Action	BMP Section
Mitigation & Monitoring Summary		
Section 8.4.4	BMC's existing Blast Management Plan will be revised in consultation with the relevant regulators to include at least the following: • Maximum of 12 blast events per week during the hours of 7:00 am to 5:00 pm, Monday to Saturday;	N/A (activity frequency not approved) **4.3**
	• Commitment for a maximum of one blast event per day during the hours of 11:00 am to 3:00 pm on Sundays only for blasts scheduled within 500 m of the MIA as defined on Figure 17 (or the approved but not yet constructed Mount Pleasant Project infrastructure area);	N/A (activity not approved)
	• MSC along with all privately owned residents located within the Project noise management receptor zone (see Table 40 and Table 41) will be offered to be notified of a Sunday blast;	N/A (activity not approved)
	• Blast design procedures to be undertaken by appropriately qualified personnel to minimise the potential for overpressure, ground vibration and blast fume impacts to residential receptors, surrounding infrastructure and BMC employees;	**4.4**
	• Ongoing review of real-time meteorological monitoring information (wind speed, direction, inversion) before the firing of any blast;	**4.5**
	• The existing blast monitoring system will be regularly reviewed and implemented to ensure it is representative of the nearest sensitive receptors in consultation with relevant regulators;	**6.3**
	• Procedures for the notification of neighbours of upcoming blast events (timing and location) and maintenance of the BMC Blasting Hotline;	**4.3**
	• Management measures to close public roads, rail infrastructure and evacuate MIAs within 500 m of a blast site during the blast event and until potentially impacted areas are clear of dust and fumes; and	**5.1**
	• A summary of blast monitoring sites and procedures.	**4.4**

APPENDIX B

REGULATORY CORRESPONDENCE

Planning Services
Resource Assessments
Contact: Jessie Evans
Phone: 9274 6419
Email: jessie.evans@planning.nsw.gov.au

Craig White
Environment and Approval Specialist
Bengalla Mining Company
Locked Bag 5
Muswellbrook NSW 2333

Dear Mr White

Bengalla Coal Mine (SSD 5170)
Management Plans

I refer to Dianne Munro's correspondence from late April and early May 2017 submitting various revised management plans for Bengalla Coal Mine (SSD 5170). I note that the Department recently approved these plans on 3 March 2016. However, Bengalla Mining Company has since revised the plans to address the new activities and requirements approved under modifications 2 and 3, the recommendations from the 2016 Independent Environmental Audit and further adjustments to account for its interactions with Mount Pleasant Coal Mine. Bengalla Mining Company is now seeking the Secretary's approval of the revised plans.

The Department has reviewed the following plans and is satisfied that they meet the relevant requirements under SSD 5170:

- Noise Management Plan version 4 (condition 7 of Schedule 3);
- Blast Management Plan version 5 (condition 15 of Schedule 3);
- Air Quality Management Plan version 4 (condition 20 of Schedule 3);
- Water Management Plan version 6 (condition 25 of Schedule 3);
- Biodiversity Management Plan version 3 and Biodiversity Offset Management Plan version 6 (condition 29 of Schedule 3);
- Aboriginal Cultural Heritage Management Plan version 7 (condition 31 of Schedule 3);
- Historic Heritage Management Plan version 7 (condition 32 of Schedule 3); and
- Rehabilitation Management Plan version 4 (condition 46 of Schedule 3).

Consequently, I wish to advise that the Secretary approves the above plans. Please provide final (untracked) versions of these plans to the Department at your earliest convenience and place a copy of them on your website.

Should you have any questions in relation to this matter, please contact Jessie Evans on the above details.

Yours sincerely

18/08/2017

Matthew Sprott
A/Director Resource Assessments
as nominee of the Secretary

Planning Services
Resource Assessments
Contact: Megan Dawson
Phone: 9274 6391
Email: megan.dawson@planning.nsw.gov.au

Craig White
Environment and Approval Specialist
Bengalla Mining Company
Locked Bag 5
Muswellbrook NSW 2333

Dear Mr White

Bengalla Coal Mine – Management Plans

I refer to your correspondence of 21 March 2017 seeking an extension of time to submit revised management plans for Bengalla Coal Mine (SSD-5170). Following the determination of Modification 3 on 23 December 2016, revised management plans were to be submitted to the Department by 23 March 2017, in accordance with condition 5 of Schedule 5 of SSD-5170.

The Department understands that additional time is required to enable Bengalla Mining Company to also address any recommendations flowing from the completion of the Independent Environmental Audit (IEA) and to consider if further adjustments are required in light of MACH Energy's proposed rail construction.

The Department considers that a single update to address the Modification, IEA and potential interactions with Mt Pleasant is appropriate. Therefore, the Secretary approves the requested extension. Please submit the plans by 12 May 2017.

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

Yours sincerely

Howard Reed 21·3·17
Howard Reed
Director Resource Assessments
as the Secretary's nominee

NSW GOVERNMENT | Planning & Environment

Contact: Chris Knight
Phone: (02) 6575 3404
Fax:(02) 6575 3415
Email:christopher.knight@planning.nsw.gov.au
Our ref: SSD-5170

Craig White
Environmental and Approvals Specialist
Bengalla Mining Company
Locked Bag 5
MUSWELLBROOK NSW 2333

Dear Craig

Bengalla Mining Company – Approval of Management Plans.

Thank you for forwarding the following listed management plans and Environmental Management Strategy to the Department of Planning & Environment (the Department or DP&E), as required by SSD 5170.

- Blast Management Plan
- Noise Management Plan
- Rehabilitation Management Plan
- Historic Heritage Management Plan
- Biodiversity Offset Management Plan
- Rehabilitation Management Plan
- Environmental Management Strategy

The Department has conducted a review and wishes to advise that the Secretary has approved the Environmental Management Strategy and above listed management plans.

These management plans and strategy come into force on the 15th March 2016 and remains in force until replaced by any future updated approved Plan.

The Department requests that you place the approved plans, along with a copy of this letter, on your website in accordance with Condition 11, Schedule 5 of SSD 5170, and a copy provided to this office for our records by the end of March 2016.

Should you have any queries on this matter, please do not hesitate to contact Chris Knight, Senior Compliance Officer, on (02) 6570 3404 or email christopher.knight@planning.nsw.gov.au.

Yours sincerely,

W Jones 8/3/16

Wayne Jones
A/Investigations (lead) Compliance Northern Region
as the Secretary's Nominee

Ref	Detail	Response
EPA		
1.1	No comments.	
Council		
2.1	No comments received as at 2 February 2016.	
DP&E		
3.1	Section 3 – Schedule 3 Condition 15 (d) states that the plan must include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions. This section currently only addresses monitoring of blast criteria.	Section 3 includes the blast monitoring section of the plan. The blast impact criteria is described in Section 4.1 and reporting is detailed in Section 6. Section 6.4.1 also discusses protocol for determining exceedances. Table 1 of the plan has been updated to include these references.
3.2	Section 4 – Schedule 3 Condition 15 (b) describe the measures that would be implemented to ensure compliance with the blasting criteria and operating conditions of this consent. Currently this section focuses on meeting the operating conditions. The section does not describe how blasts will be managed to meet blasting criteria.	Section 4.4 has been updated to include BMC Best Practice blasting techniques utilised to meet blasting criteria.
3.3	Section 4.4 – These are blast design outcomes/ criteria to be meet. This section should outline the factors taken into account during blast design and the control measures.	Section 4.4 has been updated to include how blasts will be managed to meet blasting criteria and includes a post blast review of monitoring results to enable corrective actions or adjustments to be made should higher than predicted results be recorded.
3.4	Section 6.0 – The inclusion of evaluation and reporting on compliance with blasting criteria should be included in this section where appropriate. Schedule 3 Condition 15 (d)	Reporting is detailed in Section 6 of the plan. The Annual Review is discussed in Section 6.1 and will include a detailed summary of blast monitoring results and discussion on any exceedances. Section 6.4.1 of the plan also discusses protocol for determining exceedances. Table 1 of the plan has been updated to include these references.
3.5	Section 6.4.2 – Schedule 5 Condition 3 (e) requires a contingency plan to manage any unpredicted impacts and their consequences. Currently this section does not provide adequate information to address this requirement.	Section 6.4.2 has been updated to include annual dilapidation surveys of historic heritage items and includes contingency measures for greater than predicted impact.

NSW EPA

Our reference: DOC15/396520, EF13/2634
Contact: Kurt Sorensen (02) 4908 6827
Electronic correspondence to: hunter.region@epa.nsw.gov.au

HANSON BAILEY
PO BOX 473
SINGLETON NSW 2330

Attention: Ms Dianne Munro

MANAGEMENT PLANS FOR BENGALLA MINING COMPANY PTY LIMITED
ENVIRONMENT PROTECTION LICENCE (EPL) 6538

Dear Ms Munro,

Reference is made to your letter to the Environment Protection Authority ("EPA"), dated 3 September 2015, providing copies of the Bengalla Mining Company ("BMC") Noise Management Plan (August 2015), Blast Management Plan (August 2015), Air Quality Management Plan (August 2015) and seeking comments from the EPA on the plans.

The EPA encourages the development of such plans to ensure that proponents have met their statutory obligations and designated environmental objectives. However, the EPA does not review these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives.

The EPA has not reviewed the Plan and accordingly offers no comment in relation to it.

If you require any further information regarding this matter please contact Kurt Sorensen on (02) 4908 6827.

Yours sincerely,

9.10.15

CAMERON PERRY
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APPENDIX C

CLOSURE OF PUBLIC ROADS FOR BLASTING (PRO-0001)

BENGALLA

Procedure
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Department:	**Production**		
Activity:	**Blasting**		
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1.0 PURPOSE

Bengalla's Development Consent SSD 5170 Condition 14 (a) outlines the requirement for Bengalla to prepare a Blast Management Plan.
The Blast Management Plan describes the measures that are to be implemented to ensure compliance with blast criteria and operating conditions which includes the following requiremens for road closures when blasting within 500 metres of a public road:

2.0 SCOPE

This document details the procedure required for the closure of public roads within 500 metres of blasting. The public roads affected by this procedure will be Wybong Road and Skippens Lane

3.0 REFERENCES

Work Health and Safety Act 2011
Work Health and Safety Regulation 2011
Work Health and Safety (Mines and Petroleum sites) Act 2013
Work Health and Safety (Mines and Petroleum sites) Regulation 2014
Explosive Act 2003
Explosive Regulation 2013
Roads Act 1993 NO 33
Bengalla Development Consent SSD 5170 and supporting Environmental Assessments
PRO-0485 Procedure For blast Notification Process
PRO-0486 Procedure to Tie Up & Blasting Patterns

4.0 DEFINITIONS

Shotfirer - A person who holds a valid Blasting Explosives Users License issued under the Explosives Act 2003 and who has been appointed by the CEO or delegate to work as a shotfirer at Bengalla.

Blast Coordinator -A person who holds a Certificate of Competency to be the examiner of an open cut mine and is appointed by the Mining Engineering Manager or delegate to work as a Mining Supervisor at Bengalla. Any person working as a blast coordinator must have completed the necessary training before commencing such duties (see training Document 165)

Outside Sentry - a BMC trained person acting under the direction of the Shotfirer charged with the responsibility of prohibiting any person from entering the Blasting Zone during the duration of the blast. All sentries, located on public roads, must have also undergone Roads and Maritime Service (RMS) traffic controllers course or similar.

RMS - Roads And Maritime Service is the goverment department responsible for roads and traffic in New South Wales

5.0 RESPONSIBILITIES

Role	Accountability
The Shotfirer	Responsible for blasting activities by using the appropriate Bengalla procedures to ensure all aspects of the blast are safe.
Blasting Coordinator	Responsible for assisting the Shotfirer in ensuring that the area within the Blast exclusion zone is clear for blasting.
Outside Blast Coordinator	Is the person responsible for the securing of the blast exclusion zone outside of the mine production area. This person acts under the direction of the shotfirer and provides direction to the Outside Sentries.
Traffic Control Pesonnel	Will be located on public roads and be responsible for directing traffic. They will be appropriately trained in their duties and certified as competent. As a minimum requirement, these sentries will have satisfactorily completed Road & Maritime Services (RMS) training Course “Traffic Controllers” (or equivalent). Traffic controllers shall wear high visibility clothing meeting the requirements of AS4602 and displaying the logo of their employer and the words “Authorised Traffic Controller”.

6.0 ACTIONS

6.1 In the Week Prior to Blasting

The Drill and Blast Engineer or their delegate will notify the following website of the date and time of Bengalla's intention to blast via Muswellbrook Shire Council (MSC) website, currently at the following address:
http://www.muswellbrook.nsw.gov.au/index.php/blasting/blasting-announcements

The Drill and Blast Engineer will organise suitably trained traffic control pesonnel to be available to undertake a road closure at the expected time of blasting.

6.2. The Working Day Before Blasting

The D&B Engineer or their delegate will notify the following personnel of the proposed date and time of Bengalla's intention to blast,

-Muswellbrook Shire Council
http://www.muswellbrook.nsw.gov.au/index.php/blasting/blasting-announcements
-Bengalla's Environmental Specialist

Signs will be posted along the public road in both directions indicating that "this road is subject to short closures with up to 20 minutes delay for mine blasting purposes". The sign will also display the next blast/closure date and time, as shown in Figure 1 below:

Figure 1. – Bengalla Blast Signage (Wybong Road West)

6.3 The Day of Blasting

Blasting Coordinator will,

- Confirm the expected time of firing with the shotfirer
- Confirm that suitablly trained traffic control pesonnel are availble for the schedule time of blasting
- Allocate sentries and traffic control personnel to their designated positions for the road closure.

Drill and Blast Engineer or their Delegate will confirm the scheduled date and time of the blast with persons listed on the Blast Notification Form as agreed to by the Environmental Specialist and the Dragline, Drill and Blast Superintendent. Notifications are to be made in the method that has been requested by the following contacts and at least 2 hours prior to blasting,

- Muswellbrook Shire Council website http://www.muswellbrook.nsw.gov.au/index.php/blasting/blasting-announcements
- Bengalla's Environmental Specialist,
- Muswellbrook Fire Brigade,
- Rural Fire Service,
- Ambulance Service,
- NSW Police Service
- State Emergency Service

NOTE Blasting will not take place at times when adverse environmental conditions (or other prevailing conditions) make road closure hazardous;
Blast requiring the closure of public roads will not be tied up if environmental conditions are expected to prevent blasting within the required time frame,

6.4 Prior to Blasting

The Outside Blasting Coordinator will ensure,

- Undertake an inspection of the road that is to be closed ensuring that there is no impediment that will prevent the road closure.
- Ensure appropriate signs as per the approved traffic control plan shown in Figure 2, are positioned and spaced as illustrated on the plan.
- Outside sentries located on the public road are wearing approved high visibility clothing and shall control traffic using a stop/slow bat.
- Signs and devices at approaches to the closure site shall be erected in accordance with the Traffic Control Plan by personnel who have "Apply Traffic Control Plans" certification as a minimum.
- Determine if the weather conditions require that flashing lights be errected to warn on comming traffic.

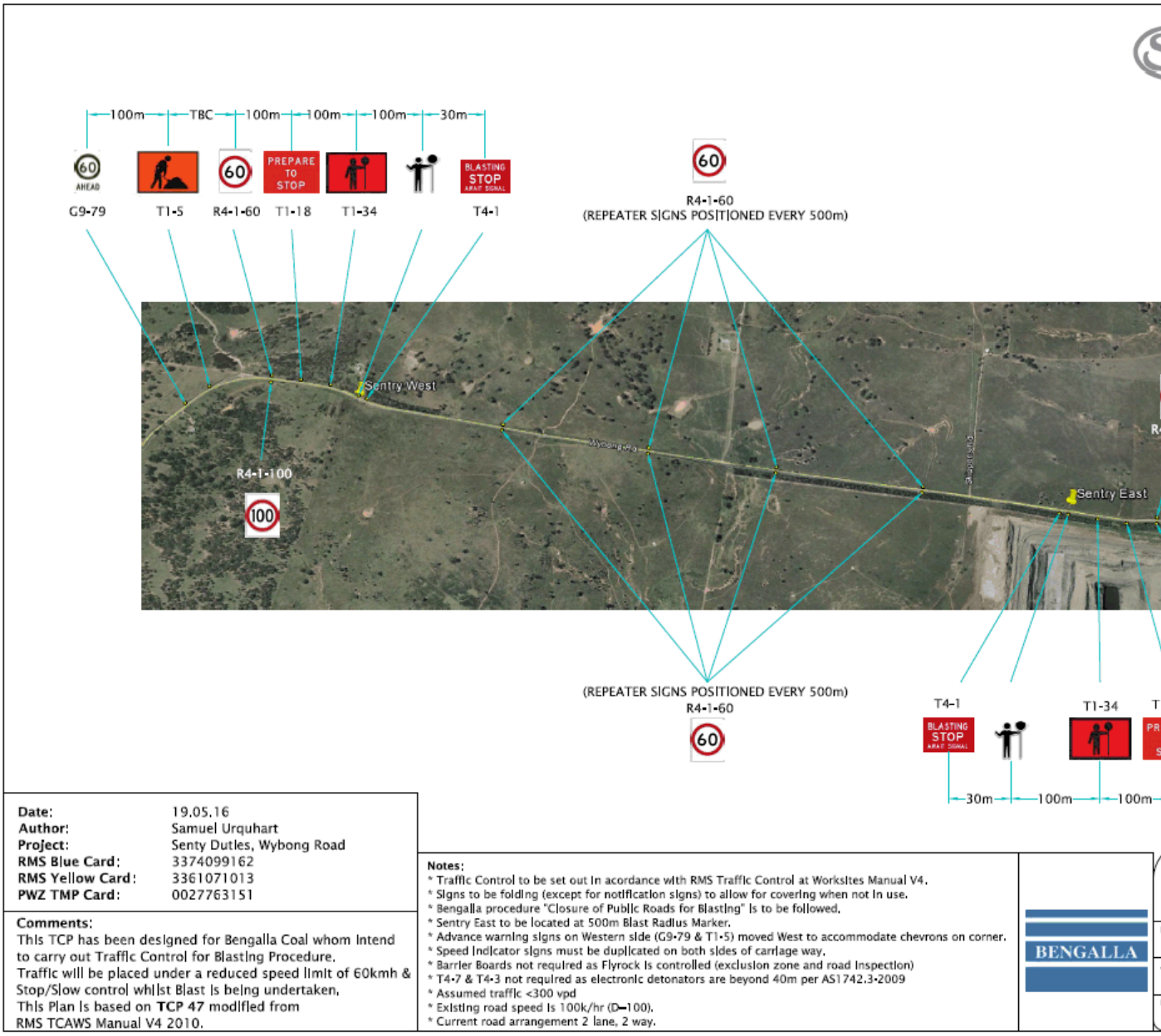
Sentries manning the stations on the public road are at all times subject to the requirements of the Police, and other officers of the law including the Roads and Maritime Service.

Figure 2- Traffic Control plan for Blasting Events (Wybong Road)

Figure 3 - Traffic Control plan for Blasting Events (Wybong Road) signage installed 2017

As the mine moves West, the area of Wybong Rd that will be subject to road closures will also move

with it,



6.5 Securing and Clearance of Public Roads for Blasting

For details on the securing and clearance of the blast exclusion zone see (PRO-0486 Tie up and securing of blast patterns for firing Section 6.3.3)

6.5 Post Blast Inspections

When the shotfirer believes it is safe to do so he will instruct the Outside Blasting Coordinator to inspect the public road for any post-blast fume, dust, debris or damage.

If there is no evidence of post-blasting fume, dust, debris or damage then the outside Blasting Coordinator will notify the Shotfirer who will then give permission to reopen the public road.

If there is evidence of debris or damage, then the outside Blasting Coordinator will notify the Shotfirer of such debris or damage. The sentries on the public road will hold the 'stop' position and delay through traffic until either,

- The debris is removed and disposed of lawfully,
- The damage is repaired,
- Traffic conditions are controlled to prevent damge or injury to persons or vehicles.

If damage to the road is confirmed to be a direct result arising from Bengalla's blasting activities, then the following process will be implemented

- Council will be notified of damage immediately by contacting the main phone number 6549 3700
- Appropriate traffic management and remediation work will be undertaken ensuring unnecessary delay is avoided.
- The road will be restored to the standard required by Muswellbrook Council at no cost to the Council.

6.6 Reopening of the Public Road

Once the Shotfirer has given permission to reopen the public road, the traffic controller will turn their sign to SLOW and wait until all queued traffic has moved on.
On completion of blasting, the Shotfirer will give permission for all sentries to leave their positions. At this stage all temporary blasting signs will be removed from the public road.

6.7 Misfire Discovered in Post Blast Inspection

If a misfire is located it will be treated as a separate blast to avoid lengthy road closures. The public road closure procedure will be re-initiated, either at that time or at a later date.

6.8 Emergency Event during Road Closure

If sentries placed on the public road encounter any of the following

- an emergency vehicle (i.e. Police, Ambulance, Fire Brigade, Mines Rescue etc)
- a distressed or desperate citizen who insists on passing through
- any other situation where individual citizens or authorities object to being stopped, then the sentry will communicate with the Shotfirer the circumstances.

The Shotfirer will then abort blasting to allow the vehicle to pass through the sentries. Once the vehicle is clear of the blasting area, the Outside Blasting Coordinator will give the Shotfirer the all clear again to recommence the shotfiring procedures.

6.9 TOOLS / EQUIPMENT & SAFETY REQUIREMENTS

All signs used for the road closure are to be designed and manufactured to meet the requirements of AS1743. All signs are to be manufactured with class 1 reflective labelling.
The outside sentries located on the public roads will communicate with each other to ensure that there is no traffic or people within the sentry locations
The following will be required for this procedure:

- Approved traffic control plan
- Required signage
- Road barriers
- Approved high-visibility clothing
- Traffic Controllers appropriately trained in RMS traffic control
- Registered vehicles
- Hand held two-way radios

Blasting is to be undertaken during daylight hours only. Public road closures resulting from blasting at Bengalla shall be scheduled to occur at times which do not impede school bus operations. The buses operate on Wybong Rd between 7.45 - 8:15 am and 3:15- 3.45 pm

7.0 REPORTING

The Shotfirers Report shall detail the length of the public road closure and any damage or debris on the public road that may have resulted from the blast.

8.0 APPENDICES

Bengalla Blast Management Plan

201305_Bengalla_Blast_Management_Plan.pdf

Traffic Control Plans **2017 Traffic Control Plan**

Wybong Road TCP V2.pdf

PM11109_Bengalla Blast TCP - Wybong Road_Issue 1.pdf

Outside Blasting Training

Out side blast co-ordinator training.pptm

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Read Access List

AllBengalla

Revision Notes

Removed any references to closing Bengalla Road
6.1 Drill and Blast Engineer will organise suitablly trained traffic control pesonnel
6.1 Updated Muswellbrook Shire Council contact email
6.3 Blast coordinator expectations
6.3 Contact stakeholders in the method that they have requested
6.4 Inspection of road before blasting activities ensuring no impediments (e.g car accident/ breakdown)
6.5 Removed all references to Securing and Clearance from this procedure as it is well documented in PRO-0486

Revision History