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Boral Quarries

Peppertree Quarry **NOISE AND BLAST MANAGEMENT PLAN**

May 2020



DOCUMENT CONTROL

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CHANGE HISTORY

Rev No.	Date	Prepared By	Approved By	Comments
1	Thursday, 5 April 2012	ERM	Sharon Makin (Boral)	First version of NBMP based on November 2011 requirements
2	Wednesday, 18 April 2012	ERM	Sharon Makin (Boral)	Preliminary Final version of NBMP
3	Thursday, 10 May 2012	ERM	Sharon Makin (Boral)	Final version of NBMP
4	Thursday, 2 August 2012	ERM	Sharon Makin (Boral)	Revised Final version of NBMP
5	November 2016	Sharon Makin (Boral)	A Shedden	Revised Final version of NBMP (Mod 4 August 2016 approval)
6	April 2017	Sharon Makin (Boral)	Angus Shedden (Boral)	Final NBMP submitted (including DP&E and EPA comments)
7	January 2020	ERM	Sharon Makin (Boral)	Revision Modification 5
8	May 2020	Sharon Makin (Boral)	Michael Higgins (Boral)	Revision Modification 6 including DPIE review

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DEFINITIONS

Term	Description
Ambient noise	The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.
C-weighted	C-weighting is an adjustment made to sound-level measurements that takes account of low-frequency components of noise within the audibility range of humans.
Decibel (dB)	A measure of sound level. The decibel is a logarithmic way of describing a ratio. The ratio may be power, sound pressure, voltage, intensity or other parameters. In the case of sound pressure, it is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure squared to a reference sound pressure squared.
decibel (A-weighted; dB[A])	Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear
LAF1	The LA1 level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the LA1 level for 99% of the time.
LAF10	The LA10 level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the LA10 level for 90% of the time. The LA10 is a common noise descriptor for environmental noise and road traffic noise.
LAF90,15min dB	The A-weighted sound pressure level measured using fast time weighting that is exceeded for 90% of the time over a 15-minute assessment period. This is a measure of background noise.
LAeq	The equivalent continuous sound level (LAeq) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.
LAm _{ax}	The maximum sound pressure level of an event measured with a sound level meter satisfying AS IEC 61672.1-2004 set to 'A' frequency weighting and fast time weighting.
Low Frequency	Noise containing major components in the low-frequency range (10 hertz [Hz] to 160 Hz) of the frequency spectrum.
Project Noise Trigger Levels (PNTL)	Target noise levels for a particular noise-generating facility. They are based on the most stringent of the project intrusiveness noise level or the project amenity noise level.

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Term	Description
Significant meteorological effects	In relation to temperature inversions, this means at least 30% of the total nighttime during the winter months. In relation to wind speeds this means at least 30% of the time or more in any assessment period (day, evening, night) in any season
Temperature inversion	An atmospheric condition in which temperature increases with height above the ground.
Tonality	Noise containing a prominent frequency and characterised by a definite pitch.
Very noise-enhancing meteorological conditions	Meteorological conditions outside of the range of either standard or noise enhancing meteorological conditions as adopted in the noise impact assessment following the procedures in Fact Sheet D (NPI, 2017).

1 INTRODUCTION

1.1 BACKGROUND

Boral Resources (NSW) Pty Ltd (Boral) own and operates Peppertree Quarry (the Quarry), a hard rock quarry located in Marulan South, New South Wales (refer to **Figure 1.1**). In February 2007, Boral was granted Project Approval (06_0074) to establish and operate the Peppertree Quarry under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Construction of the Quarry was completed in 2013 with commercial extraction operations having commenced in 2014.

The existing Quarry operations have been constructed and operated in accordance with the Project Approval (with modifications in 2009, 2011, 2012, 2016 and 2019) and an Environment Protection Licence (EPL No. 13088).

The 2007 Project Approval required the preparation and implementation of a number of management plans detailing environmental commitment, controls and performance objectives at the Quarry throughout its operational life. In accordance with the Conditions of Approval (CoA), a Noise and Blast Management Plan (NBMP) was first prepared by ERM for Boral in 2012.

In October 2019, the Project Approval was modified for the fifth time (hereafter referred to as Modification 5) under Section 75W of the EP&A Act, to establish a new overburden emplacement area southwest of the existing quarry (South-west Overburden Emplacement – SWOE) along with minor changes to the site to accommodate the proposed SWOE. The proposed project layout is outlined in **Figure 1.2** below. No changes are proposed with respect to approved methods of extraction, blasting frequency, processing, transport or stockpiling activities.

This was followed in April 2020, with the Project Approval modified for the sixth time (hereafter referred to as Modification 6) under Section 4.55 (1A) of the EP&A Act, to allow the replacement of the existing air filtration network with two baghouse air filtration units and associated ducting attached to the existing and approved secondary and tertiary processing facilities (i.e. crushing and screening plant). The baghouses are located within the current operating plant footprint.

This document is a revised version of the initial 2012 NBMP and incorporates changes associated with Modification 5, Modification 6, recommendations from the Independent Audit undertaken in November 2018 and actions identified from the 2018 Annual Review outlining noise and vibration management associated with current quarry activities. The NBMP will continue to remain a dynamic document, and will be updated as required over the life of quarry operations until the Project Approval end date of December 2038.

1.2 OVERVIEW OF OPERATIONS

The Quarry has an identified resource area of approximately 250 million tonnes, which dependent upon extraction rates, would allow quarrying for 70 years or more over an area of approximately 104 hectares (ha), within a 650 ha parcel of land owned by Boral. The Quarry produces granodiorite aggregate products and manufactured sand. All quarry products and materials are transported by rail to a number of Boral rail terminals for distribution by trucks into the Sydney metropolitan area.

Typical quarrying operations involve the stripping of overburden and the extraction of hard rock using open-cut drill and blast techniques. Overburden is stripped by dozer, loaded onto trucks using excavators and/or front end loaders and transported to the overburden emplacement areas, where it is spread and shaped by dozer. Traditional drill and blast methods are then used to break up the hard rock. A drill rig stationed on top of each production bench drills a series of holes that are later charged with explosives, detonators and delays. Boral apply standard practice of limiting the maximum instantaneous charge to stay within the relevant noise and vibration criteria.

Blasted rock is then processed on-site using various crushers and screens to obtain the desired product. Material is initially crushed in a primary mobile crusher located within the pit, directly fed by an excavator.

After passing through the primary crusher, the crushed material is taken from the pit along a series of conveyors to the first set of screens located to the northwest of the pit and material is stockpiled in a surge pile. Material in the surge pile is reclaimed and conveyed to the main processing area where it undergoes further crushing, screening and shaping. Product material is stored in the various covered storage bins prior to being dispatched off-site by train.

1.3 SCOPE AND OBJECTIVES

This NBMP applies to all activities undertaken by the Quarry including quarrying, crushing, screening, stockpiling and transportation of quarry products, maintenance activities; and associated service and support functions. It provides the framework and guidance for the Quarry activities to be conducted in a manner that appropriate control measures are implemented to minimise the potential for adverse impacts on the amenity, property and safety of quarry neighbours and meet compliance requirements of the CoA of the Project Approval. Specific objectives of the NBMP are to:

- Ensure contributed noise emissions from the quarrying operations comply with the noise impact assessment criteria in the Project Approval.
- Identify potential noise sources and their relative contribution to noise impacts from the development.
- Outline the methodologies to be used, including justification for monitoring intervals, weather conditions, seasonal variations, monitoring locations, periods and times of measurements, including the means for determining the noise levels emitted by the development.
- Ensure air-blast overpressure and ground vibration levels during blasting events comply with the relevant assessment criteria in the Project Approval.
- Outline procedures associated with blast management and community consultation.
- Provided data suitable to demonstrate compliance with the CoA of the Project Approval and subsequent modifications.

The NBMP is prepared for a mixed audience of consent authorities, environmental regulators and site personal; the latter of which are responsible for implementing this plan as part of day-to-day operations.

All operational noise levels in this document are expressed as A-Weighted decibels, dBA. C-Weighted decibels, dBC are referred to as applicable to the assessment of low frequency noise. A description of the relevant acoustic terms used throughout this NBMP is provided in the Definitions Section at the beginning of this document.

1.4 RESPONSIBILITY FOR PLAN IMPLEMENTATION

The Quarry Manager carries ultimate responsibility for the ongoing development and implementation of this NBMP and providing the necessary resources as required. The site Environmental Officer is responsible for carrying out and/or coordinating the monitoring and reporting requirements of this plan, and responding to any community concerns. Operations personnel (Quarry Supervisors) are responsible for implementing noise mitigation measures and planning of blasts to meet criteria.

Peppertree Quarry: Noise & Blast Management Plan

Figure 1.1: Consent Boundary

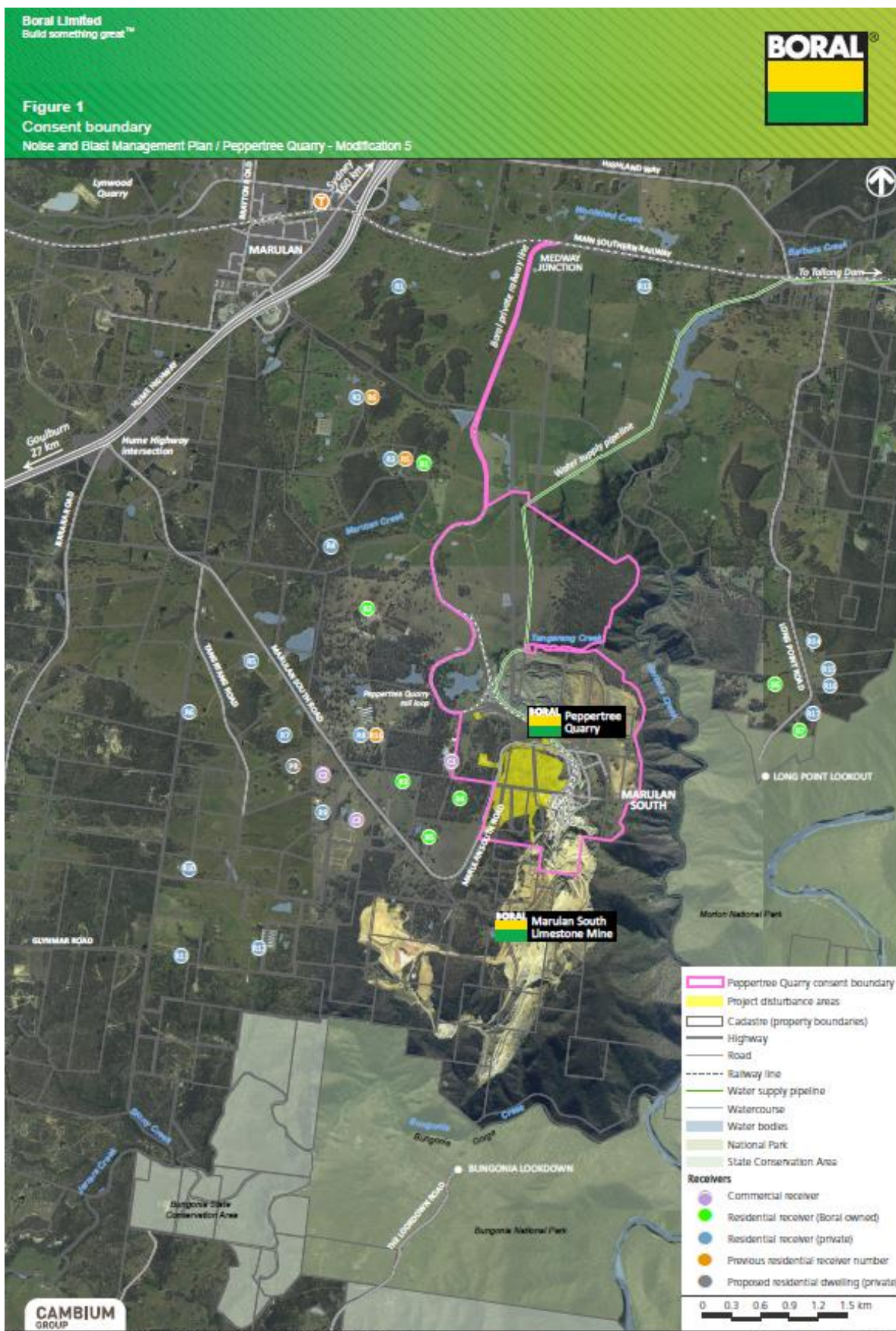
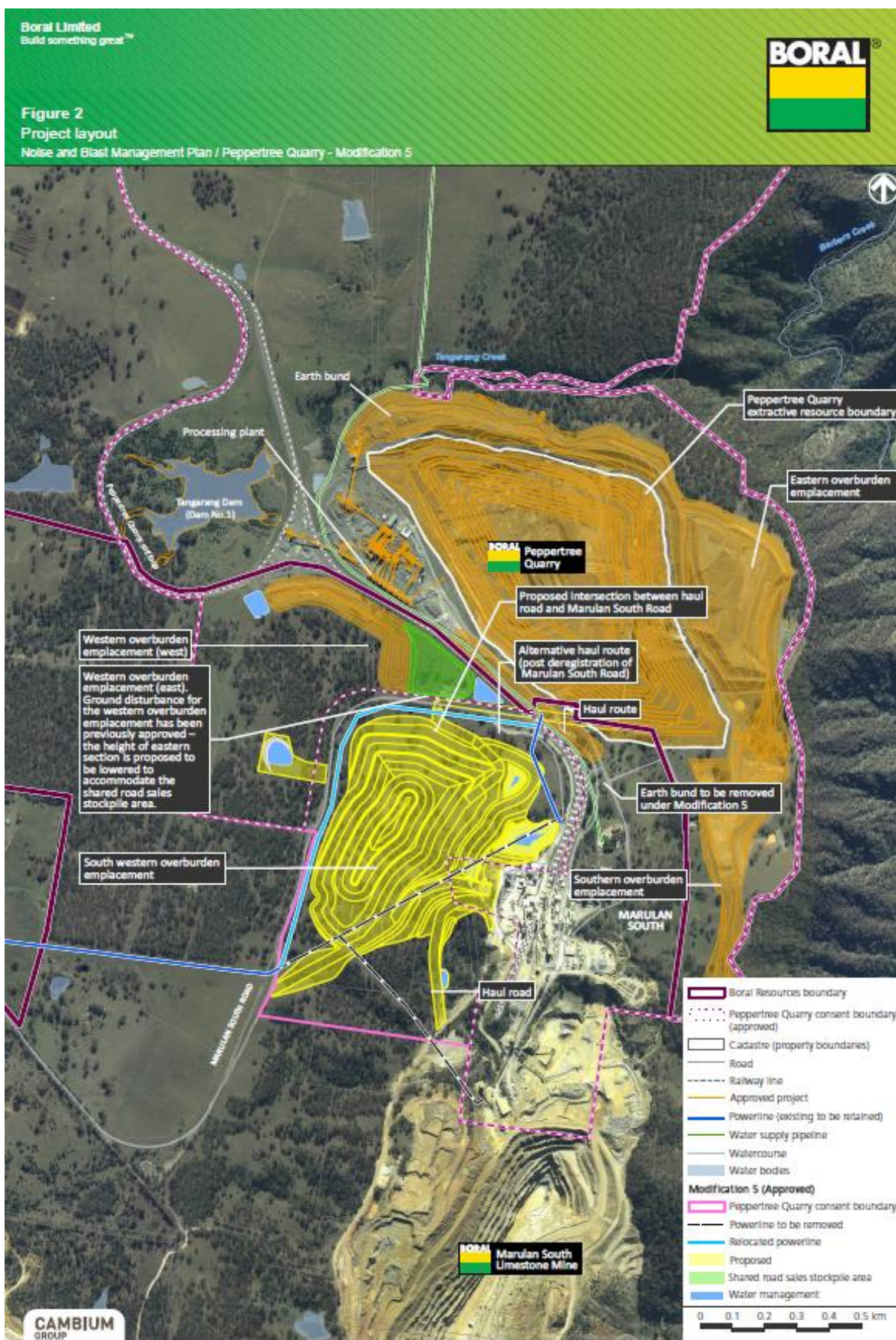


Figure 1.2: Project Layout



1.5 CONSULTATION

In accordance with the requirements of CoA A17, B9 and B17, this NBMP must be prepared in consultation with the NSW Environment Protection Authority (EPA), and appropriate details of all relevant consultation is to be included as part of the NBMP.

A meeting was held with the EPA on Wednesday 18th December 2019 to review the draft Noise and Blast Management Plan. Discussions highlighted that the NBMP needed to include:

- The EPL requirements around incident reporting into the NBMP section on incident reporting.
- EPA to receive a copy of the Annual Return. (refer Section 8.4.1)
- Modify the noise and blast impact response section to consider non-compliances. (refer Section 7)

A copy of the email correspondence following the meeting is included in Appendix 1. This version of the NBMP has been updated to address each of these items.

1.6 ALIGNMENT WITH OTHER PLANS

This document is a revised version of the NBMP initially prepared by ERM (2011). In support of the NBMP, an Air Quality Management Plan (draft May 2020) has been prepared for the Quarry. This plan has aspects of managing noise and blasts and will be applied in combination with the NBMP where relevant.

This NBMP will also incorporate findings of a Noise Impact Assessment Report (Wilkinson Murray Pty Limited, 2018) that was undertaken as part of the Modification 5 application to the Department of Planning, Industry and Environment (DPI&E), which included the determination of new 'trigger levels' (criteria) for the Project, as per the NSW Environment Protection Authority's (EPA) (2017) Noise Policy for Industry (NPI, 2017).

1.7 DOCUMENT STRUCTURE

The structure of the Management plan is outlined in **Table 1.1** below.

Table 1.1 Structure of the Management Plan

Section	Content
1	Provides an overview of the project, and objectives of the plan
2	Details the statutory requirements as outlined in the Project Approval (Modification 5 and Modification 6)
3	Describes the existing environment
4	Describes the established noise and blast criteria for the site
5	Describes the noise and blast management actions in place and to be implemented in the operation of the quarry
6	Noise and blast monitoring protocols

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Section	Content
7	Outlines incident planning and responses
8	Outlines the management plan implementation (including reporting and review requirements)
9	Lists references used in the plan preparation

2 STATUTORY REQUIREMENTS

2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (EP&A ACT)

The project was originally approved under Part 3A of the EP&A Act. The project is a transitional Part 3A project under Schedule 2 of the EP&A (*Savings, Transitional and Other Provisions*) Regulation 2017. As the modification request was made before the 'cut-off date' of 1 March 2018, the provisions of clause 3 of Schedule 2 continue to apply. Consequently, the project modification was assessed in accordance with the requirements of Part 3A and associated Regulations, and the Minister (or delegate) may approve or disapprove the carrying out of the project under section 75W of the EP&A Act.

Since Project Approval was granted in 2007, there have been five approved modifications (with conditions), as detailed below:

- Modification 1 (2009) approved for exploratory blasting and test pitting in order to verify the design of the processing plant.
- Modification 2 (2011) approved for the construction of a new rail line rather than use the existing rail facilities to the Limestone Mine.
- Modification 3 (2012) approved the construction of a high voltage power line from an existing substation to the processing plant and to provide a rail siding near the junction with the Main Southern Railway Line.
- Modification 4 (2016) approved for the extension of daily in-pit operating hours and Establishment of a new overburden emplacement area.
- Modification 5 (2019) approved for development of a new overburden emplacement (South-west Overburden Emplacement – SWOE) among other minor amendments to the site.
- Modification 6 (2020) approved for the replacement of existing dust extraction units with two baghouses and associated duct work.

The quarrying operations will continue to be subject to the provisions of the EP&A Act for any subsequent changes or modifications to the operations. Additionally, the operations will need to be able to demonstrate compliance against the current conditions of approval (CoA) relevant to noise and blasting issued under the provisions of the EP&A Act (refer to **Table 2.1** below).

Table 2.1: Noise and Blasting Conditions of Approval (Project Approval – Modification 5)

CoA	Condition of Project Approval	Addressed in Section																								
A12	<p>Hours of Operation The Proponent must comply with the operating hours set out in Table 1 of the project approval (MOD 5).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #D9D9D9;">Activity</th> <th style="background-color: #D9D9D9;">Day</th> <th style="background-color: #D9D9D9;">Time</th> </tr> </thead> <tbody> <tr> <td rowspan="3" style="background-color: #D9D9D9;">Construction works</td> <td style="background-color: #D9D9D9;">Monday-Friday</td> <td style="background-color: #D9D9D9;">7.00am to 6.00pm</td> </tr> <tr> <td style="background-color: #D9D9D9;">Saturday</td> <td style="background-color: #D9D9D9;">8.00am to 1.00pm</td> </tr> <tr> <td style="background-color: #D9D9D9;">Sunday and public holidays</td> <td style="background-color: #D9D9D9;">None</td> </tr> <tr> <td style="background-color: #D9D9D9;">Topsoil/overburden removal/emplacement and transportation of quarry products by road</td> <td style="background-color: #D9D9D9;">Any day</td> <td style="background-color: #D9D9D9;">7.00am to 7.00pm</td> </tr> <tr> <td rowspan="2" style="background-color: #D9D9D9;">Blasting</td> <td style="background-color: #D9D9D9;">Monday-Saturday</td> <td style="background-color: #D9D9D9;">9.00am to 5.00pm</td> </tr> <tr> <td style="background-color: #D9D9D9;">Sunday and public holidays</td> <td style="background-color: #D9D9D9;">None</td> </tr> <tr> <td style="background-color: #D9D9D9;">In-pit activities (including drilling, extraction, processing, and transfer of material out of the pit)</td> <td style="background-color: #D9D9D9;">Any day</td> <td style="background-color: #D9D9D9;">5.00am to 11.00pm</td> </tr> <tr> <td style="background-color: #D9D9D9;">Out-of-pit activities (including processing, stockpiling, train loading and distribution, and maintenance)</td> <td style="background-color: #D9D9D9;">Any day</td> <td style="background-color: #D9D9D9;">24 hours</td> </tr> </tbody> </table>	Activity	Day	Time	Construction works	Monday-Friday	7.00am to 6.00pm	Saturday	8.00am to 1.00pm	Sunday and public holidays	None	Topsoil/overburden removal/emplacement and transportation of quarry products by road	Any day	7.00am to 7.00pm	Blasting	Monday-Saturday	9.00am to 5.00pm	Sunday and public holidays	None	In-pit activities (including drilling, extraction, processing, and transfer of material out of the pit)	Any day	5.00am to 11.00pm	Out-of-pit activities (including processing, stockpiling, train loading and distribution, and maintenance)	Any day	24 hours	Section 5.3.4
Activity	Day	Time																								
Construction works	Monday-Friday	7.00am to 6.00pm																								
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In-pit activities (including drilling, extraction, processing, and transfer of material out of the pit)	Any day	5.00am to 11.00pm																								
Out-of-pit activities (including processing, stockpiling, train loading and distribution, and maintenance)	Any day	24 hours																								
A13	<p>Between the hours of 5:00am to 7:00am and 7:00pm to 11:00pm the:</p> <p>(a) in-pit crusher must not operate above RL 555; and</p> <p>(b) mobile plant in the pit, including excavators, front-end loaders and trucks, must not operate above RL 570.</p>	Section 5.3.4																								
A14	<p>The following activities may be carried out outside the hours specified in Table 1 of the project approval (MOD 5).</p> <p>(a) delivery or dispatch of materials as requested by Police or other public authorities; and</p> <p>(b) emergency work to avoid the loss of lives, property or to prevent environmental harm.</p> <p>In such circumstances, the Proponent must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.</p>	Section 5.3.4																								
A17	<p>Evidence of Consultation Where conditions of this approval require consultation with an identified party, the Proponent must:</p> <p>(a) consult with the relevant party prior to submitting the subject document; and</p>	Section 1.5 Annex A																								

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CoA	Condition of Project Approval	Addressed in Section
	(b) provide details of the consultation undertaken including: <ul style="list-style-type: none"> (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed the matters not resolved. 	
B3	<p>Operational Noise Criteria</p> <p>Except during noise bund construction, the Proponent must ensure that the noise generated by the project does not exceed the criteria in Table 2 of the Project Approval (MOD 5) at any residence on privately-owned land.</p> <p>Notes:</p> <ul style="list-style-type: none"> • Residential receiver locations are shown on the plan in Appendix 3. • Receiver numbers in parentheses are those identified in the approval prior to the approval of Modification 4 in August 2016. 	Section 4.1 Section 5.3
B4	<p>For the purposes of condition B3:</p> <p>(a) day means the period from 7am to 7pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays;</p> <p>(b) evening means the period from 7pm to 10pm; and</p> <p>(c) night means the period from 10pm to 7am Monday to Saturday and the period from 10pm to 8am Sunday and public holidays.</p>	Section 4.1
B5	<p>Noise generated by the project must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017).</p>	Section 6.1
B6	<p>The noise criteria in Table 2 do not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.</p>	Section 4.1
B7	<p>Land Acquisition Criteria</p> <p>If the noise generated by the project exceeds the criteria in Table 3 of the Project Approval (MOD 5), the Proponent must, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions C8 and C9.</p> <p>Notes:</p> <ul style="list-style-type: none"> • Residential receiver locations are shown on the plan in Appendix 3. 	Section 4.2

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CoA	Condition of Project Approval	Addressed in Section
	<ul style="list-style-type: none"> Receiver numbers in parentheses are those identified in the approval prior to the notification of Modification 4 in 2016. 	
B8	<p>Noise Operating Conditions The Proponent must:</p> <p>(a) take all reasonable steps to minimise all noise from construction and operational activities, including low frequency noise and other audible characteristics, as well as rail and road noise associated with the project;</p> <p>(b) operate a noise management system to guide day to day planning of quarrying operations and implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;</p> <p>(c) take all reasonable steps to minimise the noise impacts of the project during noise-enhancing meteorological conditions when the noise criteria in this approval do not apply;</p> <p>(d) take all reasonable steps to minimise the cumulative noise impacts generated by the project and the Marulan South Limestone Mine; and</p> <p>(e) regularly assess the noise monitoring data, and modify or stop operations on the site to ensure compliance with the relevant conditions of this approval.</p> <p>(f) report on the implementation and effectiveness of these measures in the Annual Review, to the satisfaction of the Secretary.</p>	<p>Section 5.3</p> <p>Section 5.3</p> <p>Section 5.3.4</p> <p>Section 5.1</p> <p>Section 5.1 and 5.3.6</p> <p>Section 8.4.1</p>
B9	<p>Noise Management Plan The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;</p> <p>(b) be prepared in consultation with the EPA;</p> <p>(c) describe the measures to be implemented to ensure:</p> <p>(i) compliance with the noise criteria and operating conditions in this approval;</p> <p>(ii) best practice management is being employed;</p> <p>(iii) noise impacts of the project are minimised during noise-enhancing meteorological conditions under which the noise criteria in this approval do not apply;</p>	<p>This Plan</p> <p>Section 1.5</p> <p>Section 5</p> <p>Section 5.3</p> <p>Section 5.3.4</p>

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CoA	Condition of Project Approval	Addressed in Section
	<p>(d) describe the noise management system;</p> <p>(i) includes a protocol for distinguishing noise emissions of the development from any neighbouring developments; and</p> <p>(e) include a monitoring program that:</p> <p>(i) is capable of evaluating the performance of the project against the noise criteria;</p> <p>(ii) carries out regular attended and unattended noise monitoring at appropriate locations, including at receiver locations R4 and R17 to determine whether the project is complying with the relevant conditions of this approval;</p> <p>(iii) provides for the use of real-time and/or supplementary attended monitoring measures, if directed by the Secretary;</p> <p>(iv) adequately supports the noise management system; and</p> <p>(v) includes a protocol for identifying any noise-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of any such event; and</p> <p>(f) detail who would be responsible for monitoring, reviewing and implementing the plan.</p> <p>Note: Receiver locations are identified in Appendix 3.</p>	<p>Section 6.1</p> <p>Section 6.1</p> <p>Section 6.2</p> <p>Section 1.4, Section 2.4.1</p>
B10	The Proponent must submit the Noise Management Plan for approval by the Secretary, within three months of the approval of Mod 5.	Section 1.4
B11	The Proponent must implement the Noise Management Plan as approved by the Secretary.	Section 6.1.1
B12	<p>Blasting – Airblast Overpressure Criteria</p> <p>The Proponent must ensure that the air blast overpressure level from blasting on the site does not cause exceedances of the criteria in Table 4 of the Project Approval (MOD 5) at any residence on privately-owned land.</p>	Section 4.3.1
B13	<p>Ground Vibration Criteria</p> <p>The Proponent must ensure that the ground vibration level from blasting on the site does not cause exceedances of the criteria in Table 5 of the Project Approval (MOD 5) at any residence or sensitive receiver on privately-owned land.</p>	Section 4.3.2
B14	The airblast overpressure and ground vibration criteria in Table 4 and Table 5 do not apply if the Proponent has an agreement with the owner/s of the relevant residence or infrastructure to exceed these criteria, and the Proponent has advised the Department in writing of the terms of this agreement.	Section 4.3.1

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CoA	Condition of Project Approval	Addressed in Section
B15	<p>Conditions B12 and B13 do not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.</p> <p>Notes:</p> <ul style="list-style-type: none"> • 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 quarry. • 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. 	Section 4.1
B16	<p>Blast Operating Conditions</p> <p>During blasting operations, the Proponent must:</p> <p>(a) take all reasonable steps to:</p> <ul style="list-style-type: none"> (i) ensure the safety of people and livestock from blasting impacts of the project; (ii) ensure that flyrock does not leave the site; (iii) protect public or private infrastructure and property in the vicinity of the site from blasting damage associated with the project; (iv) minimise blast-related dust and fume emissions; and (v) minimise the cumulative blast-related impacts of the project and the Marulan South Limestone Mine; <p>(b) operate a suitable system to enable interested members of the public to get up-to-date information on the proposed blasting schedule on the site, including:</p> <ul style="list-style-type: none"> (i) notifying the landowner/occupier of any residence within 2 kilometres of the quarry pit who registers an interest in being notified about the blasting schedule on site; (ii) operate a blasting hotline, or alternative system agreed by the Secretary, to enable the public to get up-to-date information on blasting operations at the project; and (iii) keep the public informed about this hotline (or any alternative system), to the satisfaction of the Secretary; and <p>(c) carry out regular blast monitoring to determine whether the project is complying with the relevant conditions of this approval.</p>	<p>Section 5.4</p> <p>Section 5.4.5</p> <p>Section 6.2</p>

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CoA	Condition of Project Approval	Addressed in Section
B17	<p>Blast Monitoring Program The Proponent must prepare a Blast Monitoring Program for the Project to the satisfaction of the Secretary. This program must:</p> <p>(a) be submitted to the Secretary for approval prior to the commencement of construction;</p> <p>(b) be prepared in consultation with the EPA; and</p> <p>(c) monitor the performance of the project against the relevant blast criteria.</p>	Section 6.2
B18	The Proponent must implement the Blast Monitoring Program as approved by the Secretary.	Section 6.2
B26	<p>Prior to the commencement of construction and for the life of the project, the Proponent must ensure that there is a suitable meteorological station operating in close proximity to the site that:</p> <p>(b) is capable of measuring meteorological conditions in accordance with the NSW Noise Policy for Industry (EPA, 2017), unless a suitable alternative is approved by the Secretary following consultation with the EPA.</p>	Section 5.3.5
C1	<p>Notification of Exceedances As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise, blasting or air quality criterion in PART B of this consent, the Applicant must provide the details of the exceedance to any affected landowners and/or tenants. For any exceedance of any air quality criterion in PART B of this consent, the Applicant must also provide to any affected land owners and tenants a copy of the fact sheet entitled "Mine Dust and You" (NSW Health, 2017).</p>	Section 7.2 Section 7.3 Section 7.4
D4	<p>Management Plan Requirements Management plans required under this approval must be prepared in accordance with relevant guidelines, and include:</p> <p>(a) a summary of relevant background or baseline data;</p> <p>(b) details of:</p> <p>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</p> <p>(ii) any relevant limits or performance measures and criteria; and</p>	Section 3 Section 2.1 Section 4 Section 5.1

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CoA	Condition of Project Approval	Addressed in Section
	(iii) 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;	
	(c) any relevant commitments or recommendations identified in the document/s listed in condition A2(c);	Section 2.1.1
	(d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 5.1
	(e) a program to monitor and report on the: <ul style="list-style-type: none"> (i) impacts and environmental performance of the project; and (ii) effectiveness of the management measures set out pursuant to condition D4(d); 	Section 6
	(f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 7
	(g) a program to investigate and implement ways to improve the environmental performance of the project over time;	Section 8.6.1
	(h) a protocol for managing and reporting any: <ul style="list-style-type: none"> (i) incident, non-compliance or exceedance of the impact assessment criteria or performance criteria; (ii) complaint; or (iii) failure to comply with statutory requirements; 	Section 7, 7.6
	(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development;	Section 8.3.2
	(j) a protocol for periodic review of the plan; and	Section 8.6
	(k) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of people who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval. Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Document Control Page

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CoA	Condition of Project Approval	Addressed in Section
D5	<p>Adaptive Management</p> <p>The Proponent must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in PART B. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Proponent must, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible measures to ensure that the exceedance ceases and does not re-occur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p> <p>(c) implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary.</p>	<p>Section 7.2</p> <p>Section 7.3</p> <p>Section 7.4</p> <p>Section 7.5</p>
D6	<p>Within three months of:</p> <p>(a) the submission of an incident report under condition D9;</p> <p>(b) the submission of an Annual Review under condition D11;</p> <p>(c) the submission of an Independent Environmental Audit under condition D13;</p> <p>(d) the approval of any modification of the conditions of this approval (unless the conditions require otherwise);</p> <p>(e) notification of a change in project stage under condition A15; or</p> <p>(f) the issue of a direction of the Secretary under condition A2(b) which requires a review,</p> <p>the suitability of existing strategies, plans and programs required under this approval must be reviewed by the Proponent.</p>	<p>Section 8.6</p>
D7	<p>If necessary, to either improve the environmental performance of the project, cater for a modification or comply with a direction, the strategies, plans and programs required under this approval must be revised, to the satisfaction of the Secretary and submitted to the Secretary for approval within six weeks of the review.</p> <p>Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the project.</p>	<p>Section 8.6</p>

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CoA	Condition of Project Approval	Addressed in Section
D8	The Proponent must continue to apply existing management plans, strategies or monitoring programs approved prior to the determination of Modification 5, until the approval of a similar plan, strategy or program following the determination of Modification 5.	Section 1.4
D9	<p>Reporting and Auditing – Incident Notification</p> <p>The Proponent must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project application number and name) and set out the location and nature of the incident.</p>	Section 8.4.6
D10	<p>Non-Compliance Notification</p> <p>Within seven days of becoming aware of a non-compliance, the Proponent must notify the Department of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project application number and name), set out the condition of this approval that the project is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.</p> <p>Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.</p>	Section 7.2
D11	<p>Annual Review</p> <p>By the end of March in each year after the commencement of project, or other timeframe agreed by the Secretary, a report must be submitted to the Department reviewing the environmental performance of the project, to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the project (including any rehabilitation) that was carried out in the previous calendar year, and the project that is proposed to be carried out over the current calendar year;</p>	Section 8.4
	<p>(b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, including a comparison of these results against the:</p> <ul style="list-style-type: none"> (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this approval; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition A2(c). 	Section 8.4

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CoA	Condition of Project Approval	Addressed in Section
	(c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	Section 8.4
	<p>(d) evaluate and report on:</p> <ul style="list-style-type: none"> (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions in this approval; <p>(e) identify any trends in the monitoring data over the life of the project;</p> <p>(f) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and</p> <p>(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the project.</p>	Section 8.4
D12	Copies of the Annual Review must be submitted to Council and made available to the CCC and any interested person upon request.	Section 8.4
D13	<p>Independent Environmental Audit</p> <p>Within three years of the date of the commencement of construction, and every three years after, unless the Secretary directs otherwise, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the project. The audit must:</p> <ul style="list-style-type: none"> (a) be led by a suitably qualified, experienced and independent auditor whose appointment has been endorsed by the Secretary; (b) be conducted by a suitably qualified, experienced and independent team of experts (including any expert in field/s specified by the Secretary) whose appointment has been endorsed by the Secretary; (c) be carried out in consultation with the relevant agencies and the CCC; 	Section 8.5

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CoA	Condition of Project Approval	Addressed in Section
	<p>(d) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval, any relevant EPL, water licences and mining leases for the project (including any assessment, strategy, plan or program required under these approvals);</p> <p>(e) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this approval;</p> <p>(f) recommend appropriate measures or actions to improve the environmental performance of the project and any assessment, strategy, plan or program required under the abovementioned approvals and this approval; and</p> <p>(g) be conducted and reported to the satisfaction of the Secretary.</p> <p>Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Secretary, the Proponent must submit a copy of the audit report to the Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Secretary.</p>	
D14	<p>Monitoring of Environmental Audits</p> <p>Any condition of this approval that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.</p> <p>For the purposes of this condition, as set out in the EP&A Act, “monitoring” is monitoring of the project to provide data on compliance with the approval or on the environmental impact of the project, and an “environmental audit” is a periodic or particular documented evaluation of the project to provide information on compliance with the approval or the environmental management or impact of the project.</p>	<p>Section 8.4</p> <p>Section 8.5</p>
D15	<p>Noise, blast and air quality monitoring under this consent may be undertaken at suitable representative monitoring locations instead of at privately-owned residences or other locations listed in Part B, providing that these representative monitoring locations are set out in the respective management plan/s.</p>	<p>Section 6.1 and 6.2</p>

CoA	Condition of Project Approval	Addressed in Section
1	<p>Appendix 8 – Incident Notification and Reporting Requirements</p> <p>Written Incident Notification Requirements</p> <p>A written incident notification addressing the requirements set out below must be emailed to the Department at the following address: compliance@planning.nsw.gov.au within seven days after the Proponent becomes aware of an incident. Notification is required to be given under this condition even if the Proponent fails to give the notification required under condition D9 or, having given such notification, subsequently forms the view that an incident has not occurred.</p>	Section 8.4.6
2	<p>Written notification of an incident must:</p> <ul style="list-style-type: none"> (a) identify the project and application number; (b) provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident); (c) identify how the incident was detected; (d) identify when the Proponent became aware of the incident; (e) identify any actual or potential non-compliance with conditions of approval; (f) describe what immediate steps were taken in relation to the incident; (g) identify further action(s) that will be taken in relation to the incident; and (h) identify a project contact for further communication regarding the incident. 	
3	<p>Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Secretary, the Proponent must provide the Secretary and any relevant public authorities (as determined by the Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.</p>	
4	<p>The Incident Report must include:</p> <ul style="list-style-type: none"> (a) a summary of the incident; (b) outcomes of an incident investigation, including identification of the cause of the incident; (c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and (d) details of any communication with other stakeholders regarding the incident. 	

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2.1.1 Statement of Commitments

The EA for Peppertree Quarry recommends a range of measures to avoid, manage, mitigate, offset and/or monitor the environmental impacts of the project, as set out in the Statement of Commitments. Commitments that relate to noise and blast management are set out in **Table 2.2** below.

Table 2.2: Statement of Commitments (EA, 2006)

Statement of Commitment	Referenced in NBMP
Construction of a 10m earth bund spanning the pit boundary facing the residences to the east, west and the north;	Section 5.3
Construction of an enclosure to house the tertiary plant, west of the quarry. The enclosure will be designed to provide adequate attenuation	Section 5.3
Using a drill rig with a suitable sound power level emission; Limitation of in-pit operations to the day period (7am - 7pm) only;	Section 5.3
Limitation of blasting to between the hours of 7.00 am to 6.00 pm. A blast management strategy will be used to ensure appropriate charge masses are used to avoid excessive air blast overpressure and ground vibrations;	Section 5.4
Partial cladding of the in-pit crushers to achieve an adequate reduction in their sound power levels;	Section 5.3
Selection of a dozer with lower sound power level;	Section 5.3
Cladding of the conveyors to achieve a reduction in their sound power levels;	Section 5.3
The overburden stripping fleet will be limited to an excavator, trucks and a dozer	Section 5.3
Air-blast overpressure will not exceed 115 dB(L _{peak}) for more than 5 % of the total number of blasts over a period of 12 months with a maximum level of 120 dB(L _{peak}) at any time;	Section 4.3
Peak particle velocity (PPV) from ground vibration will not exceed 5 mm/s for more than 5 % of the total number of blasts over a period of 12 months. The maximum level will not exceed 10 mm/s at any time.	Section 4.3
Noise limits will be maintained at the closest residential receivers are outlined in Table 17.1.s	Section 5.3, Section 6.1

2.1.2 Overview of Modification 5

Modification 5 to the Project Approval (06_0074) was approved in October 2019, to establish a new overburden emplacement area to the southwest of the existing quarry, which includes the following:

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- Extending the project approval boundary to capture the proposed SWOE area.
- Clearing approximately 28 hectares of critically endangered ecological community (CEEC).
- Constructing a new haul road, including an intersection with Marulan South Road.
- Relocating an existing powerline.
- Minor changes to the approved site layout, including amendments to the approved Western Overburden Emplacement and removing a requirement to construct an earth bund.

A Noise Impact Assessment Report (Wilkinson Murray, 2018) was prepared to accompany the Environmental Assessment (EA) prepared to assess environmental risks associated with the proposed development.

While the development of the proposed SWOE and changes to the overburden haul route would result in changes to operational noise levels, the proposed mitigation measures would allow Boral to comply with the EPA's recommended noise criteria. The updated conditions in the Project Approval (Modification 5) have been recommended by DPI&E to align with the NPI, 2017 and the advice provided by the EPA, and to reflect current standards. These conditions require Boral to prepare an updated NMP for the site (this NBMP).

The modification is unlikely to contribute to any significant change in existing operational or cumulative noise levels at identified sensitive receivers. This is supported by the findings of the NIA, which predicts that there would be no exceedances of the operational noise impact assessment criteria stipulated by the Project Approval and Environment Protection Licence at any identified sensitive receiver as a result of modification.

Modification 6 was approved in April 2020, allowing for the removal of existing air filtration systems and installation of two baghouse extraction units and ducting to remove excess particulate matter (i.e. fines) associated with the operation of the crushing and screening plant. The baghouses are located within the existing operating plant footprint and will operate when the Secondary and Tertiary crushing and screening is in operation.

A review of potential noise impacts was conducted as part of the Modification 6 approval application. The proposed baghouse filtration systems were shown to have a combined sound power level of 83dB(A) (or 80dB(A) per unit). The total Sound Power level for the operations area is 115dB(A). It was concluded that additional noise as a result of the baghouse filtration systems would not increase the overall total sound power level. Accordingly, the operating noise level of the proposed baghouse filtration systems will not contribute to a diminished noise environment at sensitive receivers.

Both modifications would also continue to benefit the region and NSW through the efficient and effective supply of vital quarry products to the Sydney construction industry, the continued employment of 41 full time personal and continued support of local contractors and businesses who supply maintenance and other ancillary services to Boral.

As such, this revised NBMP remains substantially consistent with initial 2011 version with additional detail reflecting CoA within Modification 5, Modification 6 and current quarry activities as of 2020.

2.2 PROTECTION OF ENVIRONMENT OPERATIONS ACT 1997

The objectives of the *Protection of Environment Operations Act 1997* (PoEO Act) are to protect, restore and enhance the quality of the environment. Some of the mechanisms that can be applied, under the PoEO Act, to achieve these objectives include reduction of pollution at source, monitoring and reporting of environmental quality.

Based on annual production volumes, Peppertree Quarry has been determined to be a 'Scheduled Activity' under Schedule 1 of the POEO Act which requires site operations to be the subject of an Environmental Protection Licence (EPL No. 13088), as may be updated from time-to-time.

The current EPL has the following compliance conditions relevant to noise management:

- Condition L.2.1: Details the noise limits to which the Quarry must comply at residential and other sensitive receivers.
- Condition L2.2: Details the location and whether conditions that noise must be measured.
- Condition L3.1: Presents the overpressure level blasting limits detailed under CoA 12 (Schedule 3) of the Project Approval.
- Condition L3.2: Presents the ground vibration level blasting limits detailed under CoA 13 (Schedule 3) of the Project Approval.

Given the updated noise criteria established as part of the recent modification to the Project Approval (Modification 5), a variation to the EPL will be required, and will be requested by Boral.

2.3 BORAL COMMITMENTS TO NOISE MANAGEMENT

2.3.1 Integrated Management System

The Quarry operates under a Boral integrated Health, Safety, Environment and Quality Management System (HSEQMS). The HSEQMS has commitments to the Boral Environmental Policy through established standards and procedures which require internal conformance to high levels of environmental performance with continual improvement objectives.

Boral have an established corporate and divisional risk-based audit program that periodically assess operational sites for conformance with HSEQMS requirements. In addition, the Quarry must be the subject of an Independent Audit every three years. An Independent Audit of the Quarry was most recently conducted in 2018 and the next Audit is due in 2021.

2.3.2 Statement of Commitment

The HSEQMS Noise Standard (GRP-HSEQ-8-05) requires each Boral operational quarry to undertake activities in accordance with the commitments in relation to noise and blast emissions presented in **Table 2.3** below.

Table 2.3: Statement of Commitment

Commitment	
Noise	Blasting
All plant and equipment is well-maintained.	Plan and design blasts to minimise noise and comply with overpressure and vibration criteria.
Restrict particularly noisy activities to suitable times of day e.g. not early morning or at night.	Monitor all blasts for both noise and vibration to ensure limits are met.
Restrict particularly noisy activities to suitable weather conditions e.g. not during temperature inversions or strong wind towards the community.	Quarry Manager and relevant personnel will be trained on the environmental obligations in relation to blasting controls.
Implement work instructions and standard operating procedures (SOPs) that, where possible, restrict noisy activities (such as material grinding) to enclosed areas and/or require doors to be kept closed.	All blasts are to planned and conducted within approved times i.e. <ul style="list-style-type: none"> • 9.00am to 5.00pm (Mon to Sat) • Not permitted on Sundays or Public Holidays
Employ buffer zones (such as vegetation buffers) or setbacks, where possible.	The surrounding landowners to be notified prior to undertaking a blast.
Use acoustic enclosures or treatment such as silencers (for extremely noisy facilities) where possible.	Review of blast monitoring data for trends and learnings to further refine the blast design and management as a continual improvement process.
If it is necessary to do out-of-hours maintenance work or other work that generates unusual noise, Regulatory approval must be obtained, the community be notified this will take place as per the GRP-HSEQ-2-02 HSEQ Communication and Consultation Standard.	Blast design, blast management procedures and the NBMP will be periodically reviewed to evaluate performance and identify any corrective action.

2.4 RELEVANT POLICY, STANDARDS AND GUIDELINES

This NBMP has been prepared with due regard to, and in accordance with the following key technical policies, standards and guidelines. A full reference list is provided in **Section 9** of this plan.

- Australia and New Zealand Environment Council (ANZEC) Guideline - *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZEC Guideline, 1990), September 1990.
- NSW Environment Protection Authority - *Noise Policy for Industry* (NPI, 2017), October 2017.
- Standards Australia AS2187.2-2006 (AS2187.2, 2006) - *Explosives - Storage and Use Part 2: Use of Explosives*.

2.4.1 Roles and Responsibilities

The HSEQMS Noise Standard has a roles and responsibilities protocol for the management of noise and vibration actions for specific personnel at the Quarry. These are documented and have been expanded upon as outlined in **Table 2.4** below.

Table 2.4: Roles and Responsibilities

Role	Responsibility
Environmental Manager	<ul style="list-style-type: none"> • Assist in the development of the NBMP. • Co-ordinate all noise and blast monitoring. • Liaison with specialists to understand compliance. • Implementation of the noise and blast response plan. • Key point of contact for all NBMP related communications and reporting. • Assist implementing training, auditing and review of the NBMP.
Quarry Manager and Production Manager	<ul style="list-style-type: none"> • Implement the NBMP. • Accountability for compliance. • Assist in implementing the NBMP noise and blast management controls. • Notify Environmental Manager of any noise or vibration complaints or concerns from community and staff. • Ensure all monitoring required under regulatory and environmental licences is undertaken.

3 BACKGROUND NOISE CONDITIONS

3.1 PRE-PROJECT CONDITIONS

The Quarry is located within a rural area, which is generally characterised by low background noise levels. Existing conditions in the local area include mostly natural sources e.g. birdsong, insects, road noise and livestock.

Existing commercial operations such as fireworks manufacturing and turkey farming, industrial operations including the agricultural lime manufacturing facility, Marulan South Road, the Limestone Mine and the Quarry are present.

The Quarry is on approximately 650 ha of Boral owned land, which includes the Quarry (occupying approximately 70 ha), additional granodiorite resources to the south and surrounding land. The site is zoned RU1 -- Primary Production under the Goulburn Mulwaree Local Environmental Plan (LEP) 2009. Mining and extractive industries are permissible in this zone with consent.

Image 1 **The Quarry and Nearby Rural Area**



3.2 HISTORIC COMPLIANCE SETTING – MOD 1 TO 4

The quarry has successfully operated in a noise context since its approval, construction and subsequent operation. Compliance monitoring has occurred as per previous CoA requirements and as per the existing NBMP.

During this time the quarry site has been compliant with operational criteria, at the majority of the receptors and for most of the time. Exceedances of the noise level criteria have however been identified and reported following the approved procedures and in consultation with all relevant stakeholders. Exceedances have generally been associated with increased noise levels from noise enhancing or very noise enhancing conditions i.e. temperature inversions

The noise sources (validated by two independent acoustics specialists) triggered a review of controls resulting in:

- Physical mitigation (to the primary bin).
- Alternate material transportation methods (from in-pit to primary, and the surge stockpile).
- A sophisticated real-time web-accessible noise/weather monitoring system.

These actions were informed by the management plan and have reduced noise levels and minimised impacts for the most affected receptors but also for the broader rural community within the area of influence of the Quarry.

3.3 CURRENT COMPLIANCE SETTING – MOD 5 AND MOD 6

As part of the Modification 5 approval application, a Noise Impact Assessment (NIA) was prepared which assessed the potential noise impacts associated of the Project on nearby sensitive residential, commercial and industrial receivers, in accordance with the Noise Policy for Industry (NPI, 2017). The NIA establishes new Project Noise Trigger Levels (PNTLs), consistent with the NPI, 2017.

The NIA modelled noise levels resulting from the modified operation to identify impacts at sensitive receivers. The modelled scenarios incorporated the worst-case noise impacts of current operations for both the day and night periods, in conjunction with:

- early overburden emplacement activities at the SWOE, with equipment and haul trucks at ground level; and
- overburden emplacement activities nearing completion, where haul trucks would be partially shielded by the SWOE.

The modelled noise levels were compared to the new PNTLs to determine if operations, as proposed to be modified, would comply with the revised criteria. The NIA noted that predicted noise levels were found to be lower than previously recorded during attended monitoring at some locations, as noise mitigation measures (including dozer noise reduction, haul truck noise reduction, enclosure of overhead bins, enclosure of the rail loading facility and processing plants, and noise mitigation of the in-pit primary crusher) were incorporated into the modelling.

Overall, the NIA indicated that noise emissions from the quarry would remain significantly below the revised noise criteria presented in the NIA.

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Modification 6 was approved in April 2020, allowing for the removal of existing air filtration systems and installation of two baghouse extraction units and ducting to remove excess particulate matter (I.e. fines) associated with the operation of the crushing and screening plant. The baghouses are located within the existing operating plant footprint and will operate when the Secondary and Tertiary crushing and screening is in operation.

A review of potential noise impacts was conducted as part of the Modification 6 approval application. The proposed baghouse filtration systems were shown to have a combined sound power level of 83dB(A) (or 80dB(A) per unit). The total Sound Power level for the operations area is 115dB(A). It was concluded that additional noise as a result of the baghouse filtration systems would not increase the overall total sound power level. Accordingly, the operating noise level of the proposed baghouse filtration systems will not contribute to a diminished noise environment at sensitive receivers.

4 ASSESSMENT CRITERIA

This chapter presents the operational noise and blast criteria that will be adopted for assessing compliance for the Quarry.

As per NPI, 2017 noise limits that are required to be met under very noise-enhancing conditions will apply based on the values presented in **Table 4.1** and **Table 4.2** below for standard and noise-enhancing conditions, plus 5 dBA.

4.1 OPERATIONAL NOISE CRITERIA

The approved project noise limits are presented in Condition B3 of Schedule 2 of the Project Approval, and are reproduced in **Table 4.1** below.

Table 4.1: Operational Noise Impacts Assessment Criteria

Noise Assessment Location	Day	Evening	Night	
	LAeq (15 min)	LAeq (15 min)	LAeq (15 min)	LA1 (1 min)
R3 (5)	40	35	35	52
R2 (6)	40	35	35	52
R8 (16)	40	35	35	52
Any other noise sensitive location	40	35	35	52

1. Residential receiver locations are shown on the plan in Appendix 3 of the Project Approval.
 2. Receiver numbers in parentheses are those identified in the approval prior to the approval of Modification 4 in August 2016.

Condition B4 further stipulates that “For the purpose of condition B3:

- (a) Day means the period from 7am to 7pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays;
- (b) Evening means the period from 7pm to 10pm ; and
- (c) Night means the period from 10pm to 7am Monday to Saturday and the period from 10pm to 8am Sunday and Public Holidays.”

Noise generated by the development is to be measured in accordance with the relevant requirements of the NPI, 2017 as outlined in **Section 6.1** below. It should also be noted that the noise criteria outlined above does not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

4.2 LAND ACQUISITION CRITERIA

Schedule 2, Condition B7 of the Project Approval states: If the noise generated by the project exceeds the criteria in Table 3 of the Project Approval, the Proponent must, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions C8 and C9. The land acquisition criteria presented in Table 3 of the Project Approval has been replicated in **Table 4.2** below.

Table 4.2: Land Acquisition Criteria

Residential Receiver location	Day (7:00am to 7:00pm) LAeq (15min)	Evening / Night (7:00pm to 7:00am) LAeq (15min)
R3 (5)	N/A	40
R2 (6)	N/A	40
R8 (16)	44	44

4.3 BLASTING CRITERIA

4.3.1 Air-blast Overpressure Criteria

The Project Approval requires that air-blast overpressure level from blasting from the project should not exceed the criteria in Table 4 of the Project Approval at any residence on privately-owned land. The criteria have been replicated from the Project Approval in **Table 4.3** below.

Table 4.3: Air-blast Overpressure Impact Criteria

Air-blast overpressure level (dB Lin peak)	Allowable Exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

4.3.2 Ground Vibration Criteria

The Project Approval requires that ground vibration level from blasting does not exceed the criteria in Table 5 of the Project Approval at any residence or sensitive receiver on privately-owned land. The criteria have been replicated from the Project Approval in **Table 4.4** below.

Table 4.4: Ground Vibration Criteria

Peak Particle Velocity (mm/s)	Allowable Exceedance
5	5% of the total number of blasts over a period of 12 months
10	0%

It should be noted that CoA B12 and B13 relating to exceedances of blast criteria do not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.

It should also be noted that the blasting criteria outlined above does not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to exceed the blasting criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

5 NOISE AND BLASTING MANAGEMENT CONTROLS

5.1 NOISE AND BLAST MANAGEMENT OBJECTIVES AND PERFORMANCE CRITERIA

The NBMP provides the framework and guidance for the Quarry activities to be conducted in a manner that appropriate control measures are implemented to minimise the potential for adverse noise and blasting impacts on the amenity, property and safety of quarry neighbours and meet compliance requirements of the CoA of the Project Approval.

The performance criteria will be used to assess the success of the management actions and are outlined in **Table 5.1** below.

Table 5.1: Noise and Blast Management Objectives and Performance Criteria

Objective	Performance Criteria
Compliance with regulatory requirements including Project Approval and EPA Environment Protection Licence	No non compliances
Implement best reasonable and feasible management practices to minimise noise levels emitted by the operations	Management controls in the NBMP in place
Identify potential noise sources and their relative contribution to noise impacts from the development	quarterly review of noise monitoring data
Ensure air-blast overpressure and ground vibration levels during blasting events comply with the relevant assessment criteria in the Project Approval;	review of blast monitoring data after each blast
Provided data suitable to demonstrate compliance with the CoA of the Project Approval and subsequent modifications.	Monitoring undertaken as per the Management plan
Ensure noise , ground vibration and over pressure remain below relevant criteria at the nearest residences	Monthly review of monitoring data including complaints Management controls in the NBMP in place

To reasonably manage and minimise cumulative noise impacts generated by the quarry and the Marulan South Limestone Mine, Peppertree Quarry’s environment advisor liaises across both operations. This role communicates regularly with both operational teams to reduce operational occurrences of simultaneously loud activities that would otherwise, and if left unmanaged, generate more significant cumulative impacts.

5.2 ASPECTS AND IMPACTS

In accordance with HSEQMS requirements, the Quarry has developed an aspects and impacts register which aligns with Australian & New Zealand Standard AS/NZS 31000:2009 Risk Management - Principles

and Guidelines. The register has identified, risk assessed and applied appropriate controls to activities with potential for noise and blasting issues, some of which include:

- Drilling and blasting of rock.
- Rail loading and product transportation.
- In-pit extraction and processing operations.
- Loading and unloading of material to crushers, stockpiles, trains and trucks.

5.3 NOISE MANAGEMENT CONTROLS

The primary objective of the following noise management controls is to minimise impacts on the surrounding community. The following hierarchical approach is used to ensure that works comply with the relevant conditions of the Project Approval:

- Quarry operations will be managed to meet the Project Approval and EPL noise criteria, through operational practices and the implementation of reasonable and feasible environmental controls as outlined in **Sections 5.3.2, 5.3.3, 5.3.4 and 5.3.5.**
- Where noise levels exceed noise criteria, ensure all controls are in place or determine the need to reduce operations and point of source noise.
- Liaise with the local community regarding scheduled works which are predicted to have increased impacts.

Furthermore, this noise management system has been developed with due regard to AS2436, which provides further guidance and detail regarding noise control mitigation and/or management that may be applied at the Quarry.

5.3.1 Best Practice Noise Management

The Independent Audit undertaken in 2018, recommended that the NBMP includes a section on best practice management in the industry and the application at the quarry if relevant. The relevant best practise methodologies have been extrapolated from Australian Government Department of Industry, Innovation and Science Leading Practice - *Sustainable Development Program for the Mining Industry Handbook for Airborne Contaminants, Noise and Vibration* (Commonwealth of Australia 2009).

Table 5.2 outlines the best practice methodologies, the section in which each methodology is addressed in the NBMP, and its application at Peppertree Quarry.

Table 5.2: Peppertree Quarry - Best Practice Methodologies

Best Practice	Addressed in Section	Peppertree Quarry application
Selecting lower noise plant and equipment incorporating available noise control kits.	Section 5.3.3	Implemented, during procurement.
Optimise mine layout to shield noise-generating plant and haul roads.	Section 5.3.2	Implemented, during design.
Apply additional silencing measures for fixed and mobile plant and ventilation fans.	Section 5.3.3	Implemented, during design.

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Best Practice	Addressed in Section	Peppertree Quarry application
Install acoustic enclosures around process plant.	Section 5.3.2 Section 5.3.3	Implemented, during design.
Utilize 'smart alarms' to minimise complaints regarding vehicle reversing alarms.	Section 5.3.3	Implemented, broadband alarms only permitted on site.
Minimise tonal components or impulsive or intermittent characteristics of noise.	Section 6.1.9	Implemented, during design and compliance monitoring
Strategically design bund walls for acoustical screening.	Section 5.3.2	Implemented, during design.
Incorporate buffer zones and landscaped setbacks.	Section 5.3.3	Implemented, during design and project planning.
Using electronic initiation of blasts rather than traditional shocktube detonators to reduce vibration impacts caused by blasting.	Section 5.4.1	Implemented, during blast design.

5.3.2 General Management Measures

The Quarry is committed to minimising impact on neighbour's amenity from noise and blasting with the following management controls being implemented throughout the life of the operation:

- Implement a combination of predictive meteorological forecasting and noise monitoring data to guide the day to day planning of quarrying operations and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of the Project Approval – refer **Section 5.3.5** and **5.3.6**
- Minimise noise impacts during adverse weather conditions. Where it is deemed necessary due to offsite disturbances, operations may be restricted. This may include ceasing the loading of trucks or changing start and finish times of crushing operations. This will need to be assessed on an individual basis depending on the weather conditions and the activities occurring at the time.
- From time to time, operations and activities vary onsite. These changes in activities can result in unplanned noise. Examples include loading from stockpiles from different locations, movement of surge materials with excavators, maintenance and /or construction activities. A Change management system is in place to assist in identifying the potential for environmental impacts including noise. This allows the change in activity to be planned to minimise any possible impacts. Should excessive noise be generated the activity is to cease until neighbours can be notified and or the noise mitigated.
- During site inductions outline the site culture of best operational practice including:
 - Tertiary operations west of the pit to be enclosed.
 - Conveyors to be covered.
 - Avoid dropping materials from height, where practicable

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- Avoid metal-to-metal contact on equipment.
- Avoid mobile plant clustering near residences.
- Close openings where appropriate on processing plant.
- Ensure all covers are in place and closed at all times when fixed and mobile plant is in operation.
- Maintain 10 m earth bund spanning the pit boundary and facing residences to the east, west and north.
- Inform all potentially impacted residents of the nature of potentially high noise generating works to be carried out, the expected noise levels and duration, as well as contact details.
- Blasting is designed and planned to ensure approval criteria is not exceeded. A number of residents (at their request) are advised of the blasts.

5.3.2.1 Construction Mitigation

A series of construction-related noise and vibration management measures will be implemented on site, to ensure construction activities associated with Modification 5 are managed to reduce impacts to nearby sensitive receptors, and to comply with the relevant CoA. These measures should be implemented in conjunction with the mitigation measures outlined in **Sections 5.3**.

- Construction works, including heavy vehicle movements into and out of the site, restricted to the hours between 7am and 6pm Monday to Friday, and between 8am and 1pm on Saturdays.
- Provide acoustic enclosures for site compressors and generators, and other noisy plant and equipment used on site during construction.
- Select and locate centralised site activities and material stores as far from noise sensitive receivers as possible.
- Ensure plant and equipment is selected and maintained with due regard to the management measures provided in **Section 5.3.3** below.
- During construction of noise bunds, comply with the construction noise criteria in the *Environmental Noise Control Manual 1994* for the first three months of the construction work. After three months, comply with the daytime operational noise criteria presented in **Section 4.1** above.
- Ensure noise bunds do not exceed 10 m in height during construction.

5.3.3 Management of Plant and Equipment

The Aspects and Impacts Register has identified Quarry plant and equipment have the highest potential for noise impacts and the following controls have been adopted to minimise the potential of Project Approval and EPL exceeding noise criteria:

- Select the most effective mufflers, enclosures and low-noise tool bits and blades.
- Orientate fans and stacks where possible in the opposite direction to identified sensitive receivers
- Select equipment (dozers, drill rigs) with suitable sound power level emissions.
- Less annoying alternatives to audible reversing alarms (such as broadband noise emitting models i.e. 'squashed duck', or 'smart' alarms) that provide a safe system of work are used on site.
- Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric-controlled units, where feasible and reasonable.

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- Reduce throttle settings and turn off equipment and plant when not being used.
- Regularly inspect and maintain equipment to ensure it is in good working order, also check the condition of mufflers. Equipment must not be operated until it is maintained or repaired, where maintenance or repair would address the annoying character of noise identified.
- Fit for purpose and Pre start checks are required on all mobile equipment which ensures effective mufflers and reversing alarms are installed.
- For machines with fitted enclosures, check that doors and door seals are in good working order and that the doors close properly against the seals.
- Utilise site topographic detail or structures to shield noise emission sources from the affected receivers, where practicable.
- Incorporate adequate buffer zones and setback distances from noise plant and equipment (or activities on site) and nearby potentially sensitive receptors

5.3.4 Operational Hours

Boral will comply with the approved operational hours outlined in the Project Approval, reproduced in **Table 5.3** below.

Table 5.3: Hours of Operations

Activity	Day	Time
Construction Works	Monday-Friday	7:00 AM to 6:00 PM
	Saturday	8:00 AM to 1:00 PM
	Sunday and public holidays	None
Topsoil/overburden removal/emplacement and transportation of quarry products by road	Any day	7:00 AM to 7:00 PM
Blasting	Monday-Saturday	9:00 AM to 5:00 PM
	Sunday and public holidays	None
In-pit activities (including drilling, extraction, processing, and transfer or material out of the pit)	Any day	5:00 AM to 11:00 PM
Out-of-pit activities (including processing, stockpiling, train loading and distribution, and maintenance)	Any day	24 hours

Additionally, between the hours of 5:00am to 7:00am and 7:00pm to 11:00pm the:

- in-pit crusher must not operate above RL 555; and
- mobile plant in the pit, including excavators, front-end loaders and trucks, must not operate above RL 570.

The following activities may be carried out outside the hours specified in Table 1 of the project approval (MOD 5).

- delivery or dispatch of materials as requested by Police or other public authorities; and
- emergency work to avoid the loss of lives, property or to prevent environmental harm.

In such circumstances, the Proponent must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

5.3.5 Monitoring Of Meteorological Conditions

Weather conditions have the potential to increase noise levels at the residential receptors in the vicinity of the quarry. Routine monitoring of meteorological conditions (including predictive meteorological forecasting) is conducted, with reference to the on-site meteorological station.

This noise management strategy is of particular importance during overburden (east and west) emplacement works where plant and equipment are elevated when compared to the quarry pit, are more exposed compared to other noise sources on site and as such are more susceptible to the effects of prevailing winds and temperature inversions.

Meteorological data is evaluated to plan on site activities potentially associated with high noise level generating activities, prior to the work being undertaken, and as close as practical to the work. The expected weather conditions and their effect on the noise generated, is considered and plans and/or timing altered if necessary. Meteorological conditions considered are:

- prevailing wind direction and velocity;
- temperature inversions;
- time of day;
- seasonal effects on weather patterns; and
- cloud cover.

A weather station has been installed on the Peppertree Quarry site to provide real-time monitoring of meteorological conditions for the operation of Peppertree Quarry. The station is equipped with a digital cell phone kit which retrieves data from the logger and transmits it directly to a computer at the site office. Loggernet software will is currently used for automatically downloading the data and to create monitoring programs (e.g. for calculations of evaporation and temperature inversion), to facilitate real-time monitoring of weather conditions.

In 2015, the Quarry commenced the utilisation of a commercially available weather forecasting dashboard which uses local weather data in providing predictions of meteorological conditions that may generate extreme noise events at nominated sensitive receivers (Refer to **Figure 5.1** below).

Forecasts of the potential for noise impacts are emailed to the Peppertree Quarry operations team to allow planning of activities accordingly.

Figure 5.1: Weather Forecast and Predicted Impacts on Operations



5.3.6 Proactive Noise Management – Real Time Noise Monitoring

Real time noise monitoring has been installed at one sensitive receiver to enable proactive noise management. Noise and local meteorological data will be streamed in real time to a website online at the quarry.

The unit will be programmed to alarm when a predetermined trigger level below the noise criteria is reached allowing primary operation equipment to cease operation. Audio of the noise will also be possible.

Operations will be allowed to continue once weather conditions change i.e. the lifting of the temperature inversion or change of wind direction.

5.4 BLAST MANAGEMENT

A comprehensive Blast management protocol is in place for all blasting operations in Boral.

The Blast Management Plan (BMP) for Peppertree Quarry was originally developed in September 2009. The Blast Management Plan is reviewed annually and a separate BMP record is collated for each blast. This NBMP is prepared to satisfy Regulatory Conditions specified within the Development Consent PA 06_0074 and Boral’s Drilling and Blasting SOP (No. 34).

Measures that are implemented to ensure compliance with the blast criteria outlined in Schedule 2 (Part B), Conditions B12 to B18 of the Project Approval include the following:

5.4.1 Blast Design

- Blasts are designed to minimise (within practical limits) the occurrence of fly-rock and to eliminate unconfined explosives related air-blast i.e. face blowouts and rifling from the blast-hole collars.
- Generally, single hole (delayed) initiation will be used with signal tube technology connecting each blast-hole and also being used to fire the blast.
- Stemming is used to produce reliable, controlled blasts.
- Boral will review and approve the proposed blast design with respect to potential blast emissions based on the current predictive site laws for ground vibration and air-blast.

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5.4.2 Explosive Loading, Initiation Hook-up and Firing

- Blast-hole depths will be accurately determined to within ± 200 mm;
- Bulk explosive loading equipment is selected to offer a loading accuracy of ± 5 kg of product, if required; and
- Column rise of the explosive product is measured and checked against design with corrective options in place to manage variations.

5.4.3 Training

All personnel involved in the drilling and blasting operations are adequately trained to ensure that people are up to date with the most current product technology and blasting techniques.

5.4.4 Avoidance of Concurrent Blasts with Adjoining Mines

Boral's Quarry Management shall be in daily contact with the adjacent Boral Cement Limestone Mine management to reduce the possibility of blasting concurrently. Blasts are planned several days in advance and notified to the Limestone management via email. Peppertree Quarry has a tendency to blast once a week and later in the day. The Limestone mine blasts more frequently and usually early afternoon.

5.4.5 Notifying Landowners or Occupiers of Blasts

Prior to production blasting, Boral will contact affected landowners or occupiers within two kilometres of the pit seeking expressions of interest in being notified of future blasts. This invitation will also be permanently posted on the quarry website.

<https://www.boral.com.au/locations/boral-marulan-south-operations>

Those who register an interest will be asked how and when they would like to be notified i.e. by telephone on the morning of blasting indicating an expected time of firing or by email, letter, or a combination of their choosing. As is stands, two nearby sensitive receptors are currently notified by email and one by phone.

5.4.6 Operational Hours

Blasting is conducted between the hours of 9am and 5pm Monday to Saturday with no blasting occurring on Sunday or public holidays as outlined in **Table 5.3** above. If blasting is delayed, the shot will be slept overnight and blasted the next day within the allowable hours.

6 NOISE AND BLAST MONITORING

This section details the Noise and Blast monitoring program, including the monitoring sites, equipment and frequency of monitoring.

The Quarry monitors levels of noise associated with operations as well as overpressure and ground borne vibration during blasting in the vicinity of the site in accordance with the Project Approval CoAs and EPL requirements.

A program for low frequency noise has been developed and implemented. Monitoring will occur on a quarterly basis in line with the existing noise monitoring program with the results reported in the quarterly noise report.

Four remote online blast monitors have been installed at site boundaries or adjacent to the quarry and continually record vibration and overpressure. One remote online blast monitor is located adjacent to the gas pipeline which intersects the quarry. This is monitored at the request of Jemena.

Five sites associated with identified sensitive receivers are monitored quarterly for noise.

An on-site weather station has been installed to provide real-time monitoring of meteorological conditions throughout the quarry operations. In addition, the Quarry utilises a commercially available weather forecasting dashboard which uses local weather data in providing predictions of meteorological conditions that may generate extreme noise events.

A real time noise monitor is in place at one sensitive receiver.

A summary of blast and noise monitoring to be conducted is provided in **Table 6.1** below.

Table 6.1: Summary of Monitoring Program

Site	Location	Parameter	Monitoring Period ¹	Monitoring Collection	Equipment
R3	Greenhills Road	Noise	48 hours for unattended, three to four attended events.	Quarterly	Type 1 or Type 2 Sound Level Meter / noise logger.
R2	Greenhills Road	Noise	48 hours for unattended, three to four attended events. Online real time noise monitoring	Quarterly ongoing	Type 1 or Type 2 Sound Level Meter / noise logger. RION NL-52 sound level meter / logger
R8	Marulan South Road	Noise	48 hours for unattended, three to four attended events.	Quarterly	Type 1 or Type 2 Sound Level Meter / noise logger.

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Site	Location	Parameter	Monitoring Period ¹	Monitoring Collection	Equipment
R4	Marulan Creek Road	Noise	48 hours for unattended, three to four attended events.	Quarterly	Type 1 or Type 2 Sound Level Meter / noise logger.
R17	Long Point Road	Noise	48 hours for unattended, three to four attended events.	Quarterly	Type 1 or Type 2 Sound Level Meter / noise logger.
B1	Gas pipeline	Overpressure, Ground Vibration	Continuous	Immediately Formal Blast report – 2 days after blast)	Remote monitor
B2	North east	Overpressure, Ground Vibration	Continuous	Immediately Formal Blast report – 2 days after blast)	Remote monitor
B3	North west	Overpressure, Ground Vibration	Continuous	Immediately Formal Blast report – 2 days after blast)	Remote monitor
B4	Manager House (643 Marulan South Road)	Overpressure, Ground Vibration	Continuous	Immediately Formal Blast report – 2 days after blast)	Remote monitor
B5	Turkey Farm	Overpressure, Ground vibration	Continuous	Immediately Formal Blast report – 2 days after blast)	Remote monitor
WS 1	Quarry east	Meteorological Conditions	Continuous	N/A – automatic download to PC	Weather Station
<p>1. Continuous monitoring excludes periods for instrument calibrations/ maintenance and extended periods of data downloads.</p>					

6.1 NOISE MONITORING

6.1.1 Introduction

Noise monitoring shall be undertaken with due regard to and in accordance with the procedures presented below.

The findings of noise monitoring will guide the day to day planning of quarrying operations and the implementation of both proactive and reactive noise mitigation and management measures to ensure compliance with the relevant CoA.

If directed by the Secretary, Boral will ensure real-time unattended noise monitoring is implemented and/or supplementary attended noise measurements are conducted. At the time this NBMP was prepared Boral had implemented a sophisticated real-time web-accessible noise/weather monitoring system. The specification and requirements of any additional noise monitoring or measurement shall be as per those presented below.

6.1.2 Monitoring Equipment

All acoustic instrumentation shall meet with the requirements of Standards Australia AS IEC 61672.1–2004™ (AS61672) – *Electro Acoustics - Sound Level Meters Specifications Monitoring* or Standards Australia AS1259.2-1990™ (AS1259) – *Acoustics – Sound Level Meters – Integrating Averaging*, as applicable to the device.

Noise measurements will be taken using a Type 1 or Type 2 ‘integrating-averaging’ Sound Level Meter (SLM) and used for operator attended noise monitoring. The SLM will be capable of conducting third octave analysis and shall be set to frequency weighting ‘A’, a ‘fast’ time weighting will apply in all cases. Measurements shall be completed at the receiver locations identified in **Figure 3** and be at least 3.5m from any reflecting structure other than the ground, with the SLM microphone placed between 1.2 and 1.5 metres above the ground. Noise loggers shall be programmed to continuously record statistical noise level indices in 15 minute intervals which may include the LA_{max}, LA₁, LA₁₀, LA₉₀, LA_{min} and the LA_{eq}.

Instrument calibration (all devices) shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ±0.5 dB(A). A hand held calibrator will be used to do these field checks, it will comply meet with the requirements of Standards Australia AS/IEC 60942:2004/IEC 60942:2003 (IEC60942) – Australian Standard™ – *Electroacoustics – Sound Calibrators*, or similar.

All noise measurements shall be accompanied by both qualitative description (including cloud cover) and quantitative measurements of local weather conditions throughout the survey period.

6.1.3 Site Noise Level Audits

As part of the noise management strategy, the noise monitoring program will conduct regular (annual) noise measurements of acoustically significant plant and equipment, to ensure that they remain within the specified design levels. Quarterly noise monitoring will also provide for a regular review of noise generating plant and equipment, with noise measurements of new or noisy plant being conducted if they are considered to be acoustically significant.

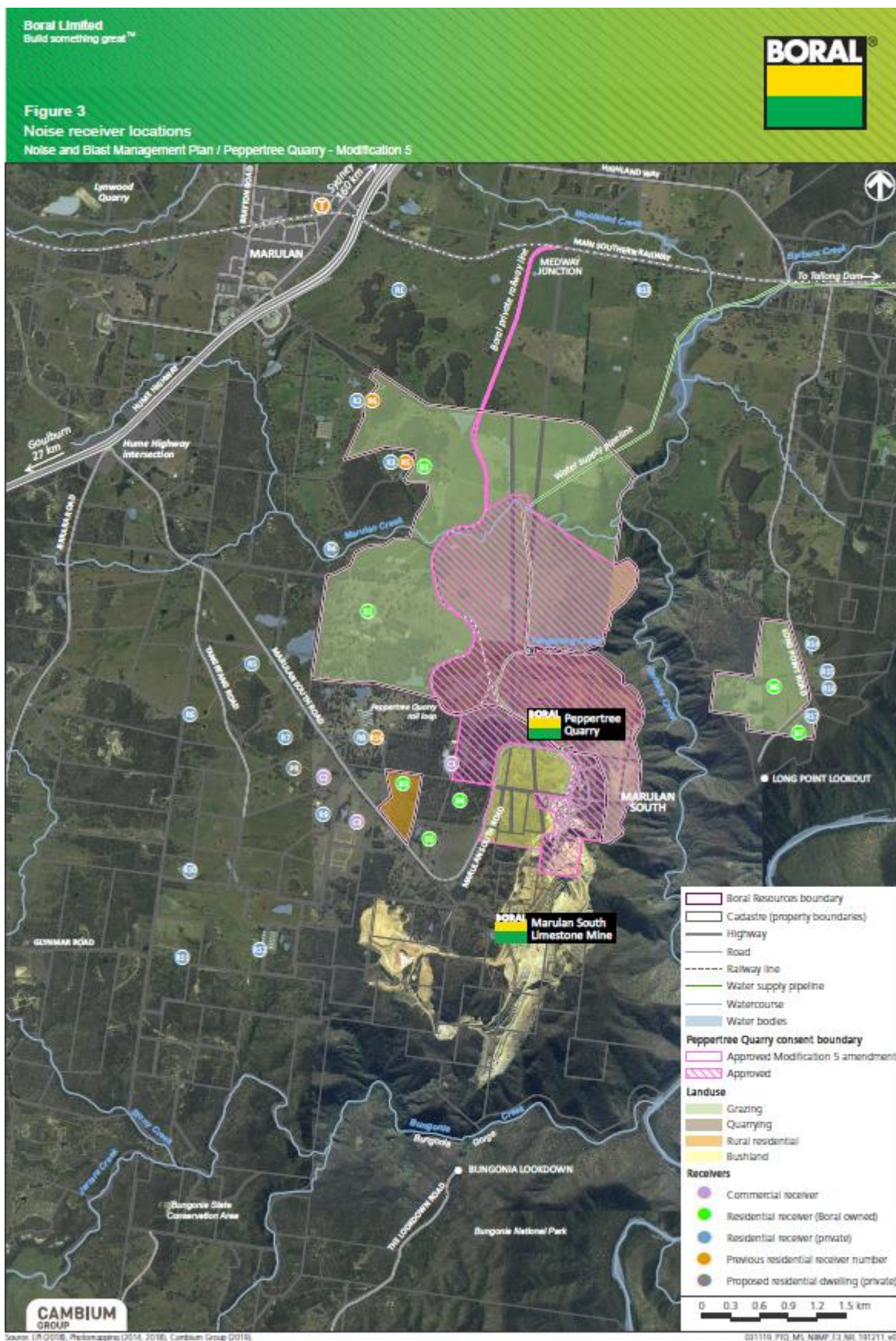
6.1.4 Frequency of Noise Monitoring

Noise is monitored quarterly and consists of continuous unattended and operator attended noise monitoring.

6.1.5 Noise Monitoring Locations

The key monitoring locations representative of the surrounding receivers, and identified in the Project Approval, are to be used for evaluating and assessing noise emissions from the project. Boral will ensure that the noise generated by the project does not exceed the noise impact assessment criteria (refer **Section 4**) at these residential receiver locations. Details of these receiver locations are summarised in **Table 6.1** and visually presented in **Figure 3**.

Figure 3: Sensitive Receiver Locations



6.1.6 Operator-Attended Noise Surveys

The SLM shall be programmed to record statistical noise levels including the L_{Amax} , $LA1$, $LA10$, $LA90$, L_{Amin} and the L_{Aeq} parameters, for each measurement conducted.

Operator-attended noise measurements shall be conducted at each of the five locations to quantify and characterise the maximum (L_{Amax} or $LA1$, 1minute) and energy equivalent (L_{Aeq}) noise levels from quarry operations over a 15 minute measurement period. Noise levels from extraneous, ambient and background noise sources and emissions should be quantified and reported upon where necessary.

The operator shall quantify site noise emissions and estimate the L_{Aeq} , Period noise contribution from the operation for the day and night time periods, as well as the overall level of ambient noise

During the attended noise measurements, the operator shall record any significant noise sources (i.e. haul trucks, dozers, etc.). In addition, the operator shall obtain copies of the relevant fixed plant and mobile equipment operating shift logs that could be included in the noise monitoring report, if relevant.

6.1.7 Unattended Noise Monitoring

To supplement the operator-attended measurements, unattended continuous noise monitoring will be undertaken to quantify overall ambient noise levels resulting from quarry operations as well as other industrial noise sources in the area. Data from unattended continuous noise logging will allow trends to be identified in ambient noise levels surrounding the quarry and the assessment of cumulative noise impacts from all industrial related noise sources in the area.

Unattended noise monitoring is undertaken on a quarterly basis at the same five identified sensitive receiver sites. Unattended monitoring is conducted over a 48 hour period where possible in line with operator attended noise surveys.

6.1.8 Data Analysis and Determining Compliance

The noise measurements shall be guided by the requirements of AS1055 and NPI, 2017. The site noise level contribution (L_{Aeq} , 15min and/or $LA1$, 1min) for the quarry shall be determined in the absence of any influential, extraneous or erroneous sound that is audibly distinguishable to that of the quarry, and compared the operational noise assessment criteria to determine compliance.

The L_{Aeq} , Period cumulative noise level contributions from the operations as well as the overall ambient noise levels together with the weather and quarry operating conditions shall be compiled on a quarterly basis and reported as per the EPL requirements on the nominated Peppertree Quarry website

It should be noted that in instances where monitoring may not be conducted at residential receivers due to access limitations, noise levels may be measured at the nearest accessible point and extrapolated via calculation to the nearest residential receiver location for comparison to noise assessment criteria.

The unattended ambient noise logger data from each monitoring location, together with the weather shall be presented in the quarterly noise monitoring report. Prior to further analysis, the ambient noise level data from each monitoring location which correlate with periods of unstable weather (i.e. rainfall greater than 0.5 mm or wind speed greater than 5 m/s) at the microphone shall be discarded.

It should be noted that the ambient noise levels do not necessarily reflect the contributed level of noise emissions from the quarry operations. The ambient noise level data quantifies the overall noise level at a given location independent of its source or character. The ambient noise monitoring data will provide indications of the cumulative noise emissions from all industrial noise sources and amenity levels.

6.1.9 Accounting for Annoying Noise Characteristics – Low-frequency Noise

The NPI, 2017 states that a noise source may exhibit a range of particular characteristics that increase annoyance, such as tones, irregularity, low frequency noise and intermittent noise. Where this is the case, an adjustment (“modifying factor” penalty) is applied to the source noise level received at an assessment point before it is compared with criteria to account for the additional annoyance caused by the particular characteristic.

Application of these modifying factors is described in Fact Sheet C of the NPI, 2017. It also provides the following definitions to support the modifying factor corrections:

- Tonal Noise – containing a prominent frequency and characterised by a definite pitch.
- Low Frequency Noise – noise with an unbalanced spectrum and containing major components within the low-frequency range (10–160 Hz) of the frequency spectrum.
- Intermittent Noise – noise where the level suddenly drops/increases several times during the assessment period, with a noticeable change in source noise level of at least 5 dB(A); for example, equipment cycling on and off.

Table C1 of Fact Sheet C (NPI, 2017) sets out the corrections to be applied and is reproduced below as **Table 6.2**. The corrections specified for tonal, intermittent and low-frequency noise are to be added to the measured or predicted noise levels at the receiver before comparison with the project noise trigger levels. The adjustments for duration are to be applied to the criterion.

All noise levels generated by the Quarry will be assessed with due regard to these modifying factor penalties, and in accordance with the requirements presented in the CoA and EPL. Tonal noise and low frequency noise (LFN) are most relevant to the Quarry and those modifying corrections are reproduced in **Table 6.3** below.

In accordance with the NPI, 2017 a maximum correction (considering other factors of intermittent noise and duration) of up to 10 dBA will be applied where two or more modifying factors are present. Where a source emits tonal and low frequency noise, only one 5 dBA correction will be applied if the tone is in the low frequency range.

One-third octave low-frequency noise thresholds referenced in Table C2 of the NPI, 2017 and **Table 6.3** of this report are identified in **Table 6.2**.

Table 6.2: One-third octave low-frequency noise thresholds

Hz/dB(Z)	One-third octave LZeq,15min threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

Table 6.3: Modifying Factors (NPI, 2017)

Factor	Assessment / Measurement	When to Apply	Correction	Comments
Tonal Noise	One-third octave band analysis using the objective method for assessing the audibility of tones in noise – simplified method (ISO1996.2-2007 – Annex D).	Level of one-third octave band exceeds the level of the adjacent bands on both sides by: <ul style="list-style-type: none"> • 5 dB or more if the centre frequency of the band containing the tone is in the range 500–10,000 Hz • 8 dB or more if the centre frequency of the band containing the tone is in the range 160–400 Hz • 15 dB or more if the centre frequency of the band containing the tone is in the range 25–125 Hz. 	5 dB ^{2,3}	Third octave measurements should be undertaken using unweighted or Z-weighted measurements. Note: Narrow-band analysis using the reference method in ISO1996-2:2007, Annex C may be required by the consent/regulatory authority where it appears that a tone is not being adequately identified, e.g. where it appears that the tonal energy is at or close to the third octave band limits of contiguous bands.
Low-frequency Noise	Measurement of source contribution C-weighted and A-weighted level and one-third octave measurements in the range 10– 160 Hz	Measure/assess source contribution C and A-weighted $L_{eq,T}$ levels over same time period. Correction to be applied where the C minus A level is 15 dB or more and: <ul style="list-style-type: none"> • where any of the one-third octave noise levels in Table C2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2-dB(A) positive adjustment to measured/predicted A-weighted levels applies for the evening/night period • where any of the one-third octave noise levels in Table C2 are exceeded by more than 5 dB and cannot be mitigated, a 5-dB(A) positive adjustment to measured/predicted A-weighted levels applies for the evening/night period and a 2-dB(A) positive adjustment applies for the daytime period. 	2 or 5 dB ²	A difference of 15 dB or more between C-and A-weighted measurements identifies the potential for an unbalance spectrum and potential increased annoyance. The values in Table C2 are derived from Moorhouse (2011) for DEFRA fluctuating low-frequency noise criteria with corrections to reflect external assessment locations.

1. Corrections to be added to the measured or predicted levels, except in the case of duration where the adjustment is to be made to the criterion.
 2. Where a source emits tonal and low-frequency noise, only one 5-dB correction should be applied if the tone is in the low-frequency range, that is, at or below 160 Hz.
 3. Where narrow-band analysis using the reference method is required, as outlined in column 5, the correction will be determined by the ISO1996-2:2007 standard.

6.2 BLAST MONITORING

6.2.1 Introduction

Blast monitors are operated for all blasts at the quarry. Blast monitoring is undertaken at five locations as presented in **Figure 4** and shown in **Table 6.5** below.

At the commencement of quarry construction, blasting was limited to the development of the pit and was infrequent. Manually operated blast monitors were used and placed at nominated locations prior to blasting and collected after the event.

The blast monitoring system now comprises remote monitors that are in continuous operation with results being able to be reviewed online through a restricted access website.

Blasting reports are prepared and made available after each blast. An example blast report has been included in **Appendix 2**.

6.2.2 Monitoring Equipment and Installation

Table 6.4 presents the general instrumentation specification for blast monitoring equipment.

Table 6.4: General Instrumentation Specification for Blast Monitoring Equipment

Specification	Seismic	Air Blast
Sample Rate	Minimum 1024 samples per second per channel	
Frequency Response	2 Hz to 250 Hz (3 dB points)	
Resolution	0.016 mm/s	0.1 dB
Range	0.1 mm/s to 254 mm/s	88 dB to 148 dB
Accuracy	3% at 15 Hz	0.2 dB at 30 Hz
Communications Link	Keyboard and modem	
Recording Mode	Full waveform recording and archiving	

Monitors have been situated in open areas where there is little potential for interference with the collection of the data from the blast.

These locations are representative of sensitive receivers and were selected following a review of the blast monitoring results from initial trial blasts.

The blast monitoring locations are close to residential receiver locations wherever practicable. In instances where monitoring cannot be conducted at residential receivers due to access limitations, then blast monitoring is undertaken at a representative site boundary location that represents the residential or

sensitive receiver. **Table 6.5** below provides the details of the blast monitors, with their locations presented on **Figure 4**. The monitors are fenced where disturbance by animals might be possible.

Individual blast design records shall be maintained to assist in the design and optimisation of future events, planning and control of blasting emissions and to provide a traceable system of documentation in case of accident or complaint. This is completed as part of the Boral Blast Management plan.

The blasting contractor shall record the blast parameters for each blast and include the location coordinates (East, North, RL) of the blast site and the maximum instantaneous charge (MIC) to be detonated in any eight millisecond (ms) interval.

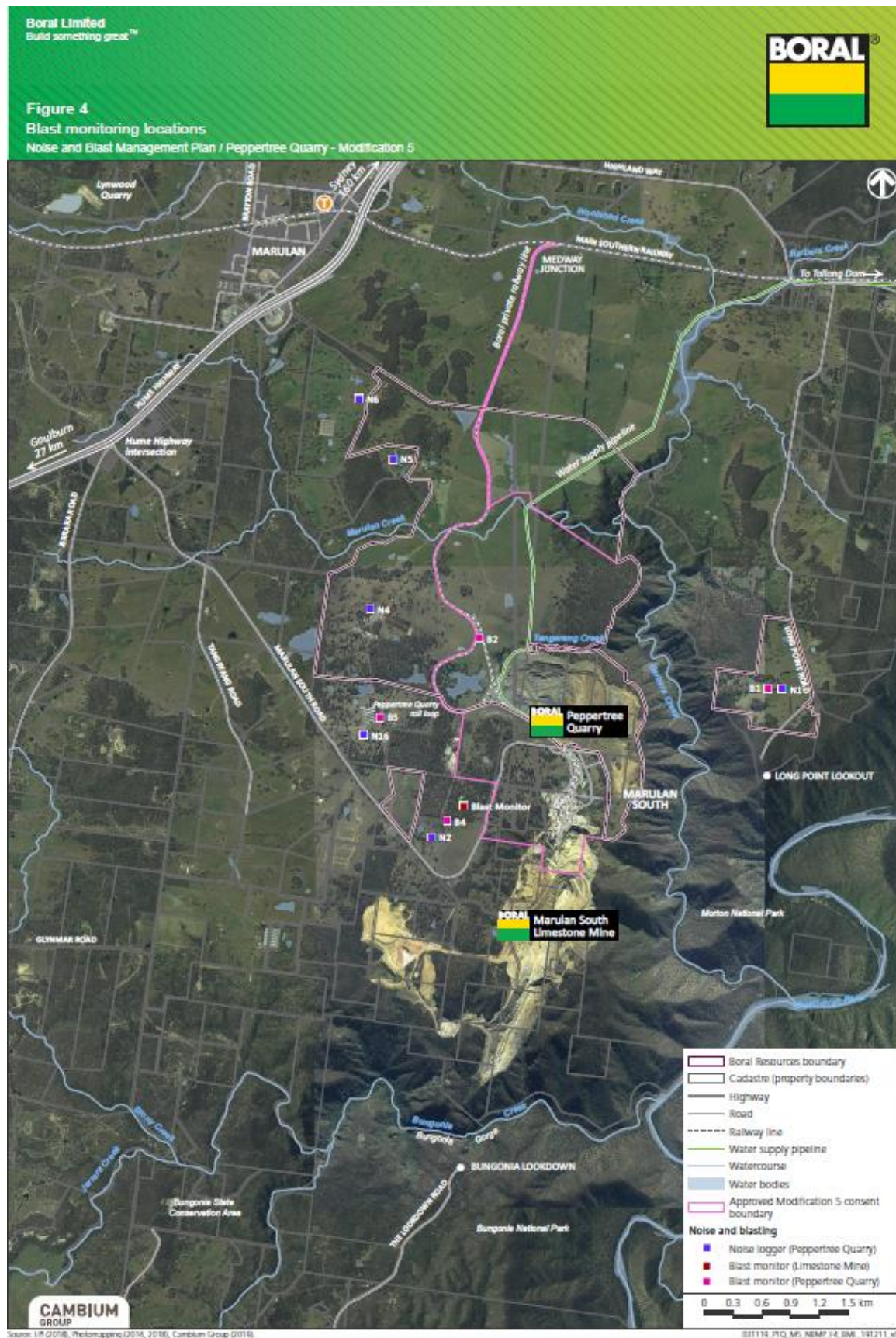
For the purposes of blast emission monitoring, the mine shall maintain a Blast Design and Emissions Record for each blast event in a suitable format guided by the requirements of AS 2187.2-1993.

In order to maximise the benefits of the blast monitoring process, the significant design parameters, emission levels and meteorological data shall be collated on a concise Blast Emissions Summary Record. The record shall form the basis for updating the blast emission site laws for vibration and air-blast at appropriate interval.

Table 6.5: Blast Monitoring Locations

Monitoring Station	Entry Address	Station Description	GPS Coordinates
1	Gas Pipeline 680m from closest blast	Adjacent to ramp up to the TLO	Latitude: [227663] Longitude: [6150065]
2	Turkey Farm 950m from closest blast	Adjacent to high voltage corridor and boundary fence	Latitude: [227282] Longitude: [6149834]
3	Rail Line 970m from closest blast	At the points to the north of the site	Latitude: [227441] Longitude: [6150813]
4	643 Marulan south road 1.6km from closest blast	Limestone Managers House	Latitude: [227109] Longitude: [6148751]
5	Long point road 1.8km from closest blast	Residence on opposite side of the gorge	Latitude: [230491] Longitude: [6150176]

Figure 4: Blast Monitoring Locations



7 NOISE AND BLAST RESPONSE PLAN

7.1 INTRODUCTION

The objective of this section is to provide procedures for responding to impacts identified by the monitoring program and by routine monitoring of the noise and blast management controls. It is also designed to act as a response plan for taking action in the unlikely event that an unforeseen incident occurs at the site (e.g. failure of noise control equipment or procedures).

Responding to identified impacts will be the responsibility of the quarry Manager.

Schedule 2, Condition D9 and D10 of the Project Approval details the reporting requirements for identified impacts/incidents and states that:

“D9. The Proponent must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project application number and name) and set out the location and nature of the incident.

D10. Within seven days of becoming aware of a non-compliance, the Proponent must notify the Department of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the project (including the project application number and name), set out the condition of this approval that the project is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: *A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.”*

An incident as defined in the Approval is deemed to be *“an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance.”*

The response plans for incidents are detailed below.

7.2 NOISE MONITORING - OPERATIONAL CRITERIA EXCEEDANCE / NON COMPLIANCE RESPONSE

Noise monitoring exceedances / non-compliance against the specified noise criteria may result due to activities at the quarry or due to the surrounding environmental conditions and other activities. Noise monitoring is conducted on a quarterly basis with exceedances being notified once the results have been supplied by the consultant undertaking the monitoring or identified at the time of attended operator monitoring.

Should low frequency noise (as outlined in **Section 6.1.9** above) be identified as an area of concern during monitoring or identified through a complaint, it will be treated as an operational noise exceedance.

Should an exceedance / noncompliance be identified the following actions will be taken:

- Impacted operations to be stopped, where possible, until appropriate control systems can be implemented or repaired.
- The Department of Planning, Industry and Environment (DPI&E), affected residents and EPA will be notified of the incident/impact/potential impact within seven days of its identification.

- An investigation will be undertaken to establish the root cause of the exceedance / non-compliance. This will include checking weather conditions at the time of the exceedance / non-compliance, Peppertree Quarry operations and other possible impacts.
- Subject to the findings of the investigation, actions will be taken to repair, replace or change the identified cause of the exceedance / non-compliance. These actions will be completed by appropriately qualified personnel or consultants.
- The identified cause of the incident and the selected response will be formally documented in an exceedance / non-compliance response report.
- Training will be undertaken, if changes are required to procedures or operations.

7.3 NOISE MONITORING - LAND ACQUISITION CRITERIA EXCEEDANCE RESPONSE

7.3.1 Notification of Exceedances

As soon as practicable and no longer than seven days after obtaining monitoring results showing an exceedance of any noise or blasting criterion identified in **Section 4** above, Boral must provide the details of the exceedance to any affected landowners and/or tenants.

7.3.2 Independent Review

If a landowner (excluding quarry owned properties) considers that the operations of the quarry are exceeding the impact assessment criteria in **Section 4**, then they may ask the Secretary in writing for an independent review of the impacts of the project on their land.

If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of the decision, and the reasons for that decision, within 21 days of the request for a review.

If the Secretary is satisfied that an independent review is warranted, then within three months, or as otherwise agreed by the Secretary and the landowner, of the Secretary's decision, the Proponent must:

- commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:
- consult with the landowner to determine their concerns; and
- conduct monitoring to determine whether the project is complying with the relevant impact assessment criteria in **Section 4**.

If the project is not complying with these criteria then, identify measures that could be implemented to ensure compliance with the relevant criteria and

Give the Secretary and landowner a copy of the independent review; and

- Comply with any written requests made by the Secretary to implement any findings of the review.

If the independent review determines that the quarrying operations are complying with the relevant criteria in **Section 4**, then the Proponent may discontinue the independent review with the approval of the Secretary.

If the independent review determines that the quarrying operations are not complying with the relevant criteria in **Section 4**, and that the quarry is primarily responsible for this non-compliance, then the Proponent must:

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- implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, 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 impact assessment criteria, to the satisfaction of the Secretary.

If the independent review determines that the project is not complying with the relevant acquisition criteria, and that the project is primarily responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent must acquire all or part of the landowner's land in accordance with the procedures in **Section 7.3.3** below.

If the independent review determines that the relevant criteria are being exceeded, but that more than one quarry/mine is responsible for this exceedance, then together with the relevant quarry/mine/s, the Proponent must:

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

If the independent review determines that the project is not complying with the relevant acquisition criteria in **Section 4** but that more than one mine is responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent must acquire all or part of the landowner's land on as equitable a basis as possible with the relevant quarries/mine/s, in accordance with the procedures in **Section 7.3.3** below.

7.3.3 Land Acquisition

Within three months of receiving a written request from a landowner with acquisition rights, the Proponent must make a binding written offer to the landowner based on:

- The current market value of the landowner's interest in the property at the date of this written request, as if the land was unaffected by the project the subject of the project application, 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.
 - Presence of improvements on the land 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.
 - The reasonable costs associated with:
 - relocating within the Goulburn Mulwaree local government area, or to any other local government area determined by the Secretary;
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
 - reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

Upon receiving such a request, the Secretary will request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:

- consider submissions from both parties;
- determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to above;
- prepare a detailed report setting out the reasons for any determination; and
- provide a copy of the report to both parties.

Within 14 days of receiving the independent valuer's report, the Proponent must make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Secretary for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Secretary will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to above, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.

Within 14 days of this determination, the Proponent must make a binding written offer to the landowner to purchase the land at a price not less than the Secretary's determination.

If the landowner refuses to accept the Proponent's binding written offer within six months of the offer being made, then the Proponent's obligations to acquire the land must cease, unless the Secretary determines otherwise.

The Proponent must pay all reasonable costs associated with the land acquisition process described above, 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.

7.4 BLAST MONITORING CRITERIA EXCEEDANCE / NON-COMPLIANCE RESPONSE

Blast monitoring exceedances / non compliances may result due to errors in blast planning or due to the surrounding environmental conditions and other activities. Exceedances / non compliances are notified once the blast monitoring report has been prepared or immediately after the blast from the restricted access website.

Should an exceedance / non-compliance be identified the following actions will be taken:

- The Department of Planning, Industry and Environment (DPI&E), affected residents and EPA will be notified of the incident/impact/potential impact within seven days of its identification.
- An investigation will be undertaken to establish the root cause of the exceedance / non-compliance. This will include checking weather conditions at the time of the exceedance / non-compliance, Peppertree Quarry operations and other possible impacts.
- Subject to the findings of the investigation actions will be taken to minimise any reoccurrence of the exceedance / non-compliance.
- The identified cause of the impact and the selected response will be formally documented in an incident response report.

7.5 NOISE OR BLAST INCIDENT RESPONSE

Adverse noise or blasting impacts are likely to be associated with malfunction of the site's engineering controls or operational procedures. This would potentially include:

- Incorrect blast planning.
- Noise from train movements.
- Vehicle movements.
- Failure of equipment due to lack of maintenance.

Once it is identified that a noise or blasting incident has occurred, the following actions will be taken:

- Impacted operations to be stopped if necessary until appropriate control systems can be implemented or repaired.
- DPI&E and NSW EPA will be notified of the incident/impact/potential impact immediately once an incident has been identified
- An investigation will be undertaken to establish the root cause.
- Subject to the findings of the investigation actions will be taken to repair, replace or change the identified cause of the incident. These actions will be completed by appropriately qualified personnel or consultants.
- The identified cause of the incident and the selected response will be formally documented in an incident response report.
- Training will be undertaken, if changes are required to procedures or operations.

7.6 COMMUNITY COMPLAINTS

- In the first instance, after receiving a complaint, the environment officer will attend the location of the complaint to confirm the noise source, quarry operations and the weather conditions.
- Investigations into the complaint will be undertaken and findings reported to the complainant.

It may be identified that additional noise monitoring may be required. Depending on the type of complaint, and location, several measurement methods and techniques can be utilised to identify the noise source causing the complaint. Such methods may include:

- operator attended measurement at the affected location combined with audio recordings or at an alternate representative location;
- unattended noise monitoring;
- real-time noise monitoring combined with audio recordings;
- calculation from near field measurements; and
- a combination of any or all the methods shown.

If monitoring is required, findings will be made available to the complainant.

In terms of complaints, Boral will record details of all complaints received in the organisation's Safety and Environment System (SIMS) and ensure that a response is provided to the complainant within 24 hours.

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If Boral's response does not address the complaint to the satisfaction of the complainant within six weeks, Boral will refer the matter to an independent mediator (approved by the Secretary) and bear the costs of such mediation. Boral will then immediately carry out such works as agreed through the mediation process.

Further, Boral will make available a report on complaints received to the Community Consultative Committee (CCC) and to relevant government agencies and the Councils upon request and include a summary in the Annual Review. The report shall include the number of complaints that have been resolved with or without mediation. A complaints register is also available on the Peppertree Quarry website.

8 MANAGEMENT PLAN IMPLEMENTATION AND IMPROVEMENT

8.1 TRAINING AND AWARENESS

8.1.1 Induction

Every employee and contractors working onsite must be inducted. The Peppertree Quarry induction covers the controls associated with managing potential impacts from noise.

8.1.2 Site Specific Training

Where identified by management representatives, additional site specific training may be developed and implemented and delivered to relevant personnel and contractors.

Blasting personnel are trained in the Boral Blast Management plan which identifies the criteria to be met and the controls to be in place.

8.2 FINANCING AND PROVISION

Funding of works associated with the NBMP will be from operational and capital budgets associated with the quarry operations.

8.3 REPORTING AND REVIEW

8.3.1 Regulatory Compliance

The site will be aware of regulatory noise and blasting limits to ensure the necessary controls and monitoring is carried out for the purpose of verifying compliance.

Regulatory documents such as the following, should be periodically reviewed for site compliance with noise management obligations:

- environmental licences; and
- planning consents.

Compliance with relevant criteria will be managed by appropriate operational management, which includes:

- maintenance and inspection of pollution controls associated with noise and blast management; and
- application of procedures / blast management protocols.

8.3.2 Community Communication

Boral will ensure that the local community is kept informed by way of periodic newsletters, leaflets, local newspaper advertisements and the quarry web page of the progress of the quarry, including details of the blasting hotline. Community Consultative Committee meetings are used to inform the committee of the general progress of the blast emissions and noise monitoring and to advise of any variation to the monitoring programs.

On request, members of the community within a 2 km radius of the quarry are informed of blasting, either by email or directly via phone prior to each blast.

8.4 REPORTING

8.4.1 Annual Review (AR)

The site environmental officer is responsible for managing the environmental reporting program and arranging specialist consultants to prepare reports, as required. The activities and performance outcomes of the NBMP will be presented in the Annual Review (AR).

This will include detailed assessment of monitoring results collected over the course of the NBMP, an evaluation of any trends occurring across the site, any community/stakeholder complaints or non-conformances with licences/criteria and recommendations for management actions.

By the end of March in each year after the commencement of project, or other timeframe agreed by the Secretary, a report must be submitted to the Department reviewing the environmental performance of the project, to the satisfaction of the Secretary. This review must:

- (describe the project (including rehabilitation) that were carried out in the previous calendar year, and the project that are proposed to be carried out over the current calendar year;
- include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - requirements of any plan or program required under this approval;
 - monitoring results of previous years; and
 - relevant predictions in MOD5;
- identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;
- evaluate and report on:
 - the effectiveness of the noise and air quality management systems; and
 - compliance with the performance measures, criteria and operating conditions in this approval;
- identify any trends in the monitoring data over the life of the project;
- identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next calendar year to improve the environmental performance of the project.
- Copies of the Annual Review are submitted to Council and made available to the CCC and any interested person upon request.

A copy of the Annual Review will also be submitted to the EPA.

8.4.2 EPL Data and Annual Return

In accordance with EPL No. 13088, all data associated with monitoring of dust, noise and blasting events is posted onto the following dedicated website for the Quarry:

<https://www.boral.com.au/locations/boral-marulan-south-operations>

In addition, an EPL Annual Return which provides a statement of compliance with the licence conditions within 60-days after the anniversary date, is issued to the EPA.

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8.4.3 Noise Monitoring Report

All routine monitoring results are documented and reported on a quarterly basis.

Quarterly reports consist of the following information:

- Summary of all attended and unattended noise monitoring results;
- Contributed noise levels from the quarry operation;
- Statement of compliance/ non-compliance; and
- Meteorological conditions should also be reported in accordance with the NSW NPI, 2017.

This information shall form the basis of the data included in the Annual Review, which shall also report on any mitigation investigation and the implementation and effectiveness of these measures, to the satisfaction of the Secretary.

8.4.4 Blast Monitoring Report

The Blast monitoring report is prepared within 48 hours where possible of a blast and is available on the restricted access website. Results are reported monthly as required by the EPL on the nominated Peppertree quarry website and are included in the Annual Review.

8.4.5 Internal Reporting

In accordance with the HSEQMS and corporate divisional requirements a regular report on environmental compliance and performance is prepared by the site environmental officer which is distributed to senior divisional managers for review for provision of additional resources that may be required to mitigate a significant environmental issue. The Boral Group Environmental Advisor is also provided with a n overview of any significant matters which may be escalated to Board level.

8.4.6 Incident Reporting

The Approval outlines a 3 staged approach to incident reporting where an incident is defined in the Project Approval, Schedule 1 as “An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance”

Initial Incident notification and reporting will be conducted In accordance with Condition D9, Schedule 2, where by “*The Proponent must immediately notify the Secretary and any other relevant agencies of any incident*”.

This incident notification requires a notification in writing to compliance@planning.nsw.gov.au identifying the project (application number and name) along with the location and nature of the incident.

Incident reporting will also be undertaken in accordance with Condition R2 of the EPA Environment Protection Licence which states “*The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.*”

In accordance with Appendix 8 of the Approval and Condition R3 of the EPA EPL, a more detailed written incident notification and report must be within 7 days of becoming aware of the incident and the initial immediate notification.

The following requirements will be included as part of the incident notification:

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- Identify the project and application number.
- Provide details of the incident (date, time, location, a brief description of what occurred any why it is classified as incident).
- Identify how the incident was detected.
- Identify when the Proponent became aware of the incident.
- Identify any actual or potential non-compliance with conditions of approval.
- Describe what immediate steps were taken in relation to the incident.
- Identify further action(s) that will be taken in relation to the incident.
- Identify a project contact for further communication regarding the incident.

Finally, within 30 days of the date on which the incident occurred (or as otherwise agreed to by the Secretary), Boral will provide the Secretary and any relevant public authorities with a detailed report on the incident, which will include the following requirement:

- Summary of the incident.
- Outcomes of an incident investigation, including identification of the cause of the incident.
- Details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence.
- Details of any communication with other stakeholders regarding the incident.

8.4.7 Pollution Incident Response Management Plan (PIRMP)

In accordance with Part 5.7A of the *Pollution of the Environment Operations Act 1997* (POEO Act), a Pollution Incident Response Management Plan (PIRMP) has been implemented at the Quarry. Although noise is not a consideration under PIRMP, there is potential for an incident associated with Blasting. The POEO Act requires:

- Identifying and risk assessing the likelihood of hazards.
- Actions for preventing and responding to incidents.
- A site specific inventory of all potential pollutants.
- Equipment to be used in an incident response.
- Plan to minimise environmental and human harm by the implementation of actions to be taken during or immediately after a pollution incident.
- Consideration of how an incident may impact neighbours.
- Communicating an incident to ARAs and neighbours.
- Staff training on their roles and responsibilities under the PIRMP.
- Annual testing and review of the PIRMP.

The Quarry Manager (or nominated Boral Authority) has the responsibility of ensuring all PIRMP reviews, revisions, training, testing and internal and external notifications are undertaken in compliance with POEO Act requirements.

8.5 AUDITING

Boral has an established corporate and divisional risk-based audit program that periodically assess operational sites for conformance with HSEQMS requirements.

In accordance with the requirements of Condition D13 of Schedule 2 (Part D), within 3 years of the date of the commencement of construction and every 3 years thereafter, unless the Secretary directs otherwise, Boral will commission and pay the full cost of an Independent Environmental Audit of the project. The adequacy of this NBMP will be included in the Independent Environmental Audit. An Independent Audit of the Quarry was conducted in 2018 and the next Audit is due in 2021.

Within three months of commencing the Independent Environmental Audit, Boral will submit a copy of the audit report to the Secretary (and any other NSW agency that requests it), together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Secretary.

8.6 REVIEW OF THIS MANAGEMENT PLAN

Condition D6 of the Project Approval outlines the review requirements associated with this NBMP. The suitability of the NBMP under the project approval requires a review within 3 months of:

- Submission of an incident report under Condition D9.
- Submission of an Annual Review under Condition D11.
- Submission of an Independent Environmental Audit under Condition D13.
- Approval of any modification of the conditions of this approval, unless the conditions require otherwise.
- Notification of a change in project stage under Condition A15.
- Issue of a direction of the Secretary under Condition A2(b) which requires a review.

If any of the above reviews result in any revisions, a revised NBMP must be provided to the Secretary within three months for approval.

8.6.1 Review Objectives

This NBMP will be reviewed periodically by suitably qualified persons to determine the efficacy of the Plan and ensure it continues to fulfil its intended purpose. This will allow for and promote adaptive management through progressive stages of future quarry operations.

Noise and blasting actions and performance will be measured through regular environmental performance reviews. These will be based on the measurable outcomes identified in this management plan and key performance criteria outlined in **Section 5.1** of this NBMP. The reviews will be used to assess progress in meeting NBMP objectives and performance criteria and will be undertaken by the site environmental officer.

9 REFERENCES

Australia and New Zealand Environment Council (ANZEC) Guideline - Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZEC Guideline, 1990), September 1990

Environmental Protection Licence (EPL No. 13088)

NSW Environment Protection Authority - **Noise Policy for Industry** (NPI, 2017), October 2017

NSW Department of Environment and Conservation (DECC) - **NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline** (the guideline), February 2006

NSW Department of Environment and Climate Change – **NSW Interim Construction Noise Guideline** (ICNG, 2009), July 2009

Standards Australia AS1055–1997 (AS1055, 1997) - **Description and Measurement of Environmental Noise**, Parts 1, 2 and 3

Standards Australia AS1055–2018 (AS1055, 2018) - **Description and Measurement of Environmental Noise**

Standards Australia AS2187.2-2006 (AS2187.2, 2006) - **Explosives - Storage and Use Part 2: Use of Explosives**

Standards Australia AS 2436–2010: R2016 (AS2436, 2016) - **Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites**

Standards Australia AS IEC 61672.1–2004 (AS61672) - **Electro Acoustics - Sound Level Meters Specifications**

International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - **Acoustics - Attenuation Of Sound During Propagation Outdoors - Part 2: General Method Of Calculation**

The Marulan South Quarry - Environmental Assessment Report prepared by ERM, dated October 2006 (EA 2006)

The Project Approval (06_0074) and subsequent modifications, and other relevant project information provided by Boral, importantly the Project Approval modified for the fifth time under Section 75W of the EP&A Act

Peppertree Quarry Modification Environmental Assessment (Element Environment, 2018)

Statement of Environmental Effects, Peppertree Quarry, Modification 6 (2020)

APPENDIX 1 EPA CORRESPONDENCE



Makin, Sharon <sharon.makin@boral.com.au>

Review of the Peppertree Quarry Noise & Blast and Air Quality Management Plans

2 messages

Makin, Sharon <sharon.makin@boral.com.au> 18 December 2019 at 15:12
To: Mike Hienes <michael.heinze@epa.nsw.gov.au>, Janine Goodwin <Janine.Goodwin@epa.nsw.gov.au>

Michael, Janine,

thank you for your time today to review and discuss the drafted Noise and Blast and Air Quality Management plans for Peppertree Quarry required as part of the Modification 5 approval.

As we discussed I will modify the plans to include...

- the EPL requirements around incident reporting into the Section on Incident reporting on both reports,
- consider a definition of air quality Impact and when reporting would be required outside of non compliance, exceedances or an incident,
- EPA to receive a copy of the Annual Return and
- modify the noise and blast impact response section to consider non compliances.

your time and review was very much appreciated.

kind regards

SHARON MAKIN

Stakeholder and Environment Advisor - Marulan South

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Janine Goodwin <Janine.Goodwin@epa.nsw.gov.au> 19 December 2019 at 10:12
To: "Makin, Sharon" <sharon.makin@boral.com.au>, Michael Heinze <Michael.Heinze@epa.nsw.gov.au>

Hi Sharon

Many thanks for your time yesterday, and we note your proposal below as per our discussions.

Kind regards

Janine

APPENDIX 2 BLAST REPORT

Orica - Australia

Blast Journal

QNSW01 - Boral - Peppertree

Blast number: PTQ19-72
 Fired: 2019-12-12 12:23

General		Placement	
Created by	BlastIQ	East	228432.797908968
Shot firer		North	6149786.00858288
Created	2019-12-12T03:17:59.173	Z	579.38807182466
Fired	12/12/2019 12:23:42	Charge	
Timespan	5	Number of boulders	
Blast supervisor		Charge per hole	
Contract part		Total amount of explosives [kg]	
Type of blast Section	Bench	MIC [kg]	
Hole		Charge per detonator [kg]	Min: Max:
HoleSpacing [m]	Min: Max:	Charge per hole [kg]	Min: Max:
Burden [m]	Min: Max:	Charge per delay [kg]	Min: Max:
Number of holes		Powder factor [kg/m³]	
Holes per interval		Stemming [m]	
Holes per row	Min: Max:	Type of explosive	
Hole Depth [m]	Min: Max:	Size	
Hole Diameter [mm]	Min: Max:	SizeArea [m²]	
Number of rows		SizeBenchHeight [m]	
Subdrilling [m]	Min: Max:	Volume [m³]	
Initiation		Length [m]	
Number of intervals		Width [m]	
Initiation type		SizeBlastedRock [ton]	
Cover		Load event	
CoverCount			
CoverDuk			

Peppertree Quarry: Noise & Blast Management Plan

Cover type	Start time
	Stop time
Note	Document <input type="text" value="0"/>

Measurementpoint for fired timestamp: 2019-12-12 12:23

Measurement Point	Placement	Date	Value	VPPV	Limit	Percentage of Limit	Distance	Remark
#1 Turkey Fam	Airblast	12/12/2019 12:23:42	99.80 dBL		115	87	1152	
#1 Turkey Fam -L	Vibration	12/12/2019 12:23:42	0.69 mm/s	1.02 mm/s	5	14	1152	
#1 Turkey Fam -T	Vibration	12/12/2019 12:23:42	0.85 mm/s	1.02 mm/s	5	17	1152	
#1 Turkey Fam -V	Vibration	12/12/2019 12:23:42	0.35 mm/s	1.02 mm/s	5	7	1152	
#2 Gas Pipeline	Airblast	12/12/2019 12:23:41	104.50 dBL		0	17	819	
#2 Gas Pipeline -L	Vibration	12/12/2019 12:23:41	0.55 mm/s	0.74 mm/s	0	17	819	
#2 Gas Pipeline -T	Vibration	12/12/2019 12:23:41	0.65 mm/s	0.74 mm/s	0	17	819	
#2 Gas Pipeline -V	Vibration	12/12/2019 12:23:41	0.45 mm/s	0.74 mm/s	0	17	819	