



***Narrabri Coal Operations Pty Ltd***

ABN: 15 129 850 139

***Noise Management Plan***

***for the***

***Narrabri Mine***

***Including a***

***Noise Monitoring Protocol***

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## ***Noise Monitoring Protocol***

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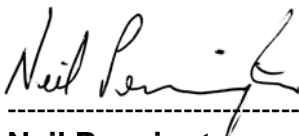
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### Revision and Issue Control

Pages listed above are the subject of a revision to the current issue of this manual. This manual can have pages of different revision status; however, the official issue of the complete manual is to be the same on all pages. The certification above is to be made by the highest level of management

**I, Neil Pennington, a qualified acoustic specialist approved by the NSW Department of Planning and Infrastructure, certify that I have prepared this Noise Management Plan.**



**Neil Pennington**

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Principal/Director

Spectrum Acoustics Pty Limited

31 October 2011

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## ACRONYMS USED THROUGHOUT THIS REPORT

AR	-	Annual Review
CCC	-	Community Consultative Committee
CHPP	-	Coal Handling and Preparation Plant
dB	-	Decibel
dB(A)	-	A-weighted decibel
DoPI	-	Department of Planning and Infrastructure (formerly Department of Planning (DoP))
DRE	-	Division of Resources and Energy (part of the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS)) (formerly Industry and Investment NSW (I&I NSW))
EA	-	Environmental Assessment
EMS	-	Environmental Management Strategy
ENCM	-	Environmental Noise Control Manual
INP	-	Industrial Noise Policy
ISO	-	International Standards Organisation
NCOPL	-	Narrabri Coal Operations Pty Ltd
NM	-	Narrabri Mine
NMP	-	Noise Management Plan
NSC	-	Narrabri Shire Council
OEH	-	Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water (DECCW))
PA	-	Project Approval
RBL	-	Rating Background Level

# 1 INTRODUCTION

---

## 1.1 Location

The Narrabri Mine ("the mine") is located approximately 30km south-southeast of Narrabri, and 10km north-northwest of Baan Baa (see **Figure 1**). The mine is being developed by Narrabri Coal Operations Pty Ltd (NCOPL) as an underground mining operation.

The mine lies within a 5,213ha area covered by mining lease ML 1609 ("the mine site"), with an indicative mining area of approximately 3,630ha, and a surface facilities area of approximately 465ha.

## 1.2 Project Approvals

Project Approval (PA) 05\_0102 was granted for Stage 1 Operations in November 2007. This approval permitted the development of the mine site on the basis of a maximum production rate of 2.5 million tonnes per annum (Mtpa) by continuous miner methods. A modification to the Stage 1 approval was granted on the 26<sup>th</sup> March 2010, under Section 75W of the *Environmental Planning and Assessment Act, 1979*, which permitted the following additional activities:

- A change in the sequence of underground panel roadway development;
- Construction and use of a ventilation shaft (the West Mains ventilation shaft) and associated infrastructure in the area above the West Mains roadway between Stage 2 Longwalls 2 and 25), in place of the existing main ventilation drift;
- Construction and use of a small diameter vertical ventilation shaft (ie. rear of panel ventilation shaft) associated with Stage 2 Longwalls 1 to 3;
- Construction and use of gas (and potentially water) pre-drainage infrastructure, involving drilling from the surface into and along the coal seam, generally within the area of Stage 2 Longwalls 1 to 3;
- Construction (but not operation) of a CHPP, immediately south of the ROM coal stockpile, within the pit top area;
- Construction and use of supporting infrastructure (eg. access tracks, electricity spur lines and gas/water pipelines);
- Additional surface disturbance of approximately 35ha of primarily cleared agricultural land. This surface disturbance would be associated with: ventilation shafts; pre-drainage boreholes; and associated supporting infrastructure (eg. access tracks, electricity spur lines and gas/water pipelines);
- Employment of an additional 35 people over a period of approximately 12 months (ie during construction of the above mentioned components).

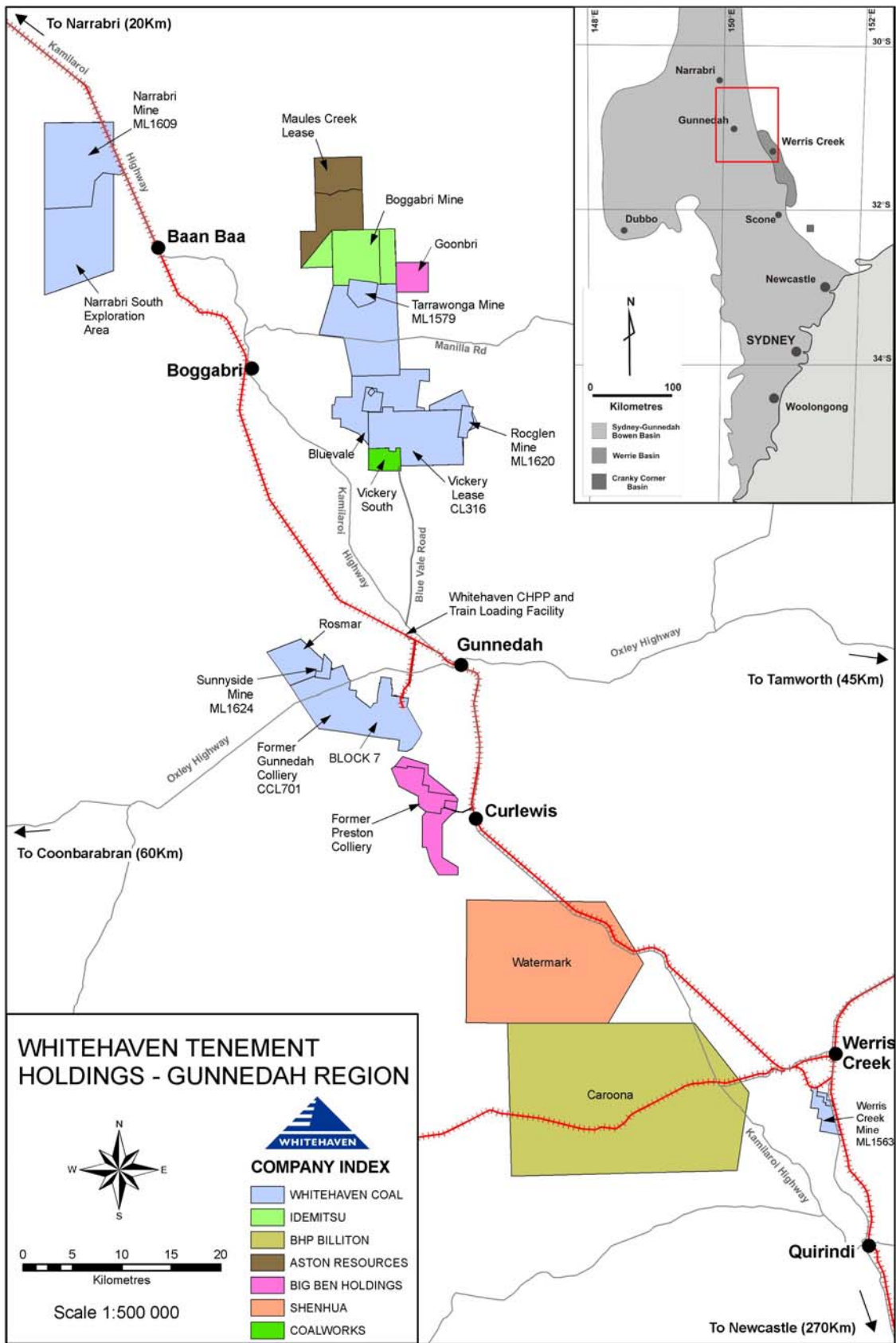


Figure 1 Narrabri Coal Mine Location

Project Approval 08\_0144 for Stage 2 Operations was granted on the 26<sup>th</sup> July 2010 and allows for the conversion of the Narrabri Coal Mine from a 2.5 Mtpa continuous miner operation to a maximum 8 Mtpa longwall operation.

### 1.2.1 Project Approval Conditions

Schedule 4, Condition 4 of PA 08\_0144 is as follows:

*“4. The Proponent shall revise the Noise Management Plan for the Stage 1 project to encompass all proposed mine activities and potential impacts associated with noise management (Stages 1 and 2) and subsequently implement the revised version of this Noise Management Plan to the satisfaction of the Director General. This plan shall:*

- (a) be prepared in consultation with DECCW by a suitably qualified expert whose appointment has been approved by the Director General;*
- (b) be submitted to the Director General for approval by the 30 June 2011;*
- (c) include a noise monitoring program incorporating:*
  - real time noise and temperature inversion monitoring; and*
  - Attended noise monitoring**to monitor the performance of the project;*
- (d) include reactive noise control measures to manage noise impacts for sensitive receivers; and*
- (e) include a protocol to establish whether the project is complying with the noise impact assessment criteria in Table 1.”*

### 1.3 Operations

Under the current approved project, the following operational activities will take place on site:

- Mining of coal using underground longwall mining methods at a maximum rate of 8 Mtpa for Stage 2 operations;
- Transportation of the mined coal to the Run-of-Mine (ROM) stockpile via conveyor;
- Crushing and sizing of the ROM coal through the crushing plant and stockpiling on the product stockpile;
- Loading of product coal onto train via the rail load out bin for transportation to Port Newcastle;
- Construction works associated with the west mains ventilation shaft and associated infrastructure and subsequent operation;
- Construction and operation of a small diameter rear of panel ventilation shaft;
- Construction and use of gas and water pre-drainage infrastructure;
- Construction and operation of the CHPP;
- Transport of reject from the CHPP to the Reject Emplacement Area; and
- Construction of supporting infrastructure.

## 1.4 Background Data

The background data relating to noise levels at and surrounding the site are outlined in the Noise and Blasting Impact Assessments for the Stage 1 and 2 projects (Spectrum Acoustics 2007 and 2009, respectively) and the Narrabri Mine Annual Review (AR) for 2008-2009, 2009-2010 and 2010-2011.

## 1.5 Noise Management

It is recognised that the operation of the mine has the potential to increase noise levels received at residences in proximity to the mine site. In order to manage the potential impacts on local noise amenity, and in compliance with *Schedule 4, Condition 4* and *Schedule 6, Condition 2* of PA 08\_0144, this Noise Management Plan (NMP) has been prepared.

The NMP includes a Noise Management Protocol, which is presented as **Appendix 1**. The noise impact assessment criteria as applicable under PA 08\_0144 are presented in **Section 2**. In effect, the NMP:

- Identifies the noise impact assessment criteria for the mine;
- Records the measures which will mitigate the environmental effects of noise from the above activities on surrounding neighbours;
- Proposes noise monitoring programs, incorporating real time noise and continuous temperature inversion monitoring and attended monitoring to assess and actively manage to minimise noise impacts and then report the levels of impact; and
- Provides a mechanism whereby any noise complaint can be dealt with quickly and effectively.

The NMP has been prepared with reference to relevant legislation and guidelines and is consistent with the commitments in the following documentation:

- Noise and Vibration Impact Assessment – included as Volume 2 (Part 7) of the Specialist Consultant Studies Compendium accompanying an Environmental Assessment for the Narrabri Coal Mine Stage 1 Project;
- Noise and Blasting Assessment – included within the Environmental Assessment for the Narrabri Coal Mine Section 75W Modification Environmental Assessment – specifically Section 4.3;
- Noise and Vibration Impact Assessment – included as Volume 2 (Part 6) of the Specialist Consultant Studies Compendium accompanying an Environmental Assessment for the Narrabri Coal Mine Stage 2 Project; and
- Final Statement of Commitments for the Narrabri Coal Mine Stage 2 Project – specifically commitments 10.1-10.22.

## **1.6 Purpose and Scope**

The purpose of this Noise Management Plan is to implement the standards and procedures necessary for the effective noise management at the mine and to assign responsibilities to personnel to undertake these tasks.

This plan applies to noise management associated with the surface components of the Narrabri Mine.

## 2 NOISE IMPACT ASSESSMENT CRITERIA

Noise impact assessment criteria for the development were established in the *Environmental Assessment* using relevant NSW Office of Environment and Heritage (OEH, formerly DECCW) guidelines. These criteria have been incorporated in PA 08\_0144 *Conditions 4(1), 4(2) and 4(3)* which are reproduced below. Additionally, PA 08\_0144 *Condition 4(5)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

### 2.1 Noise Limits

4(1) *The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.*

Table 1: Impact assessment criteria dB(A)

Location	Day LAeq(15 min ute)	Evening LAeq(15 min ute)	Night	
			LAeq(15 minute)	LA1(1 minute)
All Privately owned Residences	35	35	35	45

Notes:

- *To determine compliance with the LA<sub>eq(15 minute)</sub> limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.*
- *These noise limits apply to applicable receivers under all meteorological conditions except for any one of the following:*
  - *wind speeds greater than 3 metres/second at 10 metres above ground level; or*
  - *temperature inversions of 1.5 - 4°C/100 metres and a source to receiver wind speed greater than 2 metres/second at 10 metres above ground level; or*
  - *temperature inversions of greater than 4°C/100 metres.*
- *The meteorological data to be used for determining meteorological conditions are the data recorded by the meteorological weather station to be determined in consultation with the DECCW.*
- *To determine compliance with the LA1(1 minute) noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

- 4(2) *If the noise generated by the project exceeds the Criteria in Table 2 at any residence on privately owned land, or on more than 25% of any privately owned land, then the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of Schedule 7.*

Table 2: Noise acquisition criteria dB(A).

Location	Day LAeq(15 min ute)	Evening LAeq(15 min ute)	Night
			LAeq(15 minute)
All Privately owned Residence s	40	40	40

*Note: Noise generated by the project is to be measured in accordance with the notes presented below in Table 1. For this condition to apply the exceedances of the criteria must be systemic.*

- 4(3) *If the noise generated by the project is equal to or exceeds the criteria in Table 3 at any residence on privately owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double glazing, insulation and/or air conditioning) at the residence in consultation with the landowner. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director General for resolution.*

Table 3: Additional noise mitigation criteria.

Location	Day LAeq(15 min ute)	Evening LAeq(15 min ute)	Night
			LAeq(15 minute)
All Privately owned Residence s	38	38	38

*Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 1. For this condition to apply, the exceedances of the criteria must be systemic.*

## 2.2 Continuous Improvement

4(5) *The Proponent shall:*

- a) *implement all reasonable and feasible best practice noise mitigation measures;*
- b) *investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and*
- c) *report on these investigations and the implementation and effectiveness of these measures in the AEMR, to the satisfaction of the Director General.*

### 3 MANAGEMENT SAFEGUARDS AND AMELIORATIVE ACTIONS

The following actions or strategies will be implemented to minimise the potential for noise impacts at residential receivers.

#### 3.1 Noise Controls

Under some meteorological conditions, it is acknowledged that some activities may generate noise levels above the noise impact assessment criteria. In order to minimise this potential for exceedance, the following controls will be adopted:

- Prior to being brought onto site, or upon commissioning, all additional plant and equipment would be required to exhibit sound power levels consistent with Appendix A of the noise assessment prepared by Spectrum Acoustics (2009) presented in **Table 1**.

**Table 1: Noise Source Sound Power Levels, L<sub>w</sub>**

Noise Source	L <sub>w</sub> , dB(A)	
<b>Surface works noise sources</b>	<b>(L<sub>Aeq</sub>)</b>	
Building fabrication at surface facilities	107	
Front end loader	114	
2 x Topsoil scrapers	115	
Overburden truck	113	
Grader	108	
Pneumatic roller	109	
<b>Operational noise sources</b>	<b>(L<sub>Aeq</sub>)</b>	<b>(L<sub>Amax</sub>)</b>
Conveyors	80 dB/m	--
Dozer at stockpile <sup>1</sup>	107	114
Crusher (attenuated)	100	108
CHPP (attenuated)	109	--
Rail Load-out	102	114
Workshop	95	105
Ventilation fans (attenuated) <sup>2</sup>	103	105
Personnel carrier	110	115
Locomotives idling on rail loop	102	106

Note 1: Based on measurements taken at Werris Creek Mine. May be either attenuated D10 or other dozer with limited reverse speed.

Note 2: As modelled in acoustic assessment. Level of 98dB(A) is likely to be achieved.

- High frequency reversing alarms will not be permitted on any equipment brought onto site. Rather, all reversing alarms should be of the broadband frequency type;
- Restrict scraper operations under temperature inversion conditions until noise compliance is identified;
- Ensure specific noise attenuation is provided to surface drills when operating over LW1 to LW3 and LW24 to LW26 to achieve a sound power level of 109dB(A);
- The approved hours of operation (of PA 08\_0144) will be adhered to;

- Site personnel will be required to pay due attention to site weather conditions and modify or stand down from operational activities if directed by mine management; and
- Monitoring of emitted noise levels will be undertaken during mining operations to verify compliance with noise criteria and to assess the need, if any, for additional noise attenuation measures.

### **3.2 Transport Noise Controls**

- The site access road will be sealed and regularly maintained;
- Strict adherence to the approved hours of operation for transport activities will be enforced by mine management;
- All project employees and contractors will be instructed to enter and exit the mine site in a courteous manner and without undue traffic noise; and
- All access roads will be signposted and speed limited to minimise transport noise.

### **3.3 Other Noise Controls**

- Equipment with lower sound power levels will be used in preference to more noisy equipment;
- All equipment used on site will be regularly serviced to ensure the sound power levels remain at or below the levels used in the modelling to assess generated noise levels and compliance with the criteria;
- The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads; and
- NM will maintain dialogue with neighbours and the local community to ensure any concerns in relation to operational or transport noise are addressed.

### **3.4 Risk Management**

- The Environmental Officer will identify, assess and eliminate or control noise management risks at the mine; and
- The Environmental Officer will update the NMP where appropriate to include control measures identified as a result of risk assessments.

### **3.5 Defect Reporting**

- Along with any other defects, any noise exceedance will be treated as a defect at the mine and must be reported as required by the Defect Management Standard to ensure that relevant persons in the mine management structure are notified, who must then initiate the repair of the defect.

## **4 MANAGEMENT OF COMMUNITY CONSULTATION**

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### **4.1 Community Consultation**

Community consultation was an important element throughout the planning and investigation stages into the Narrabri Mine (NM). This program will continue throughout the life of the mine, with NM addressing any concerns raised by the local community in a timely and efficient manner.

A Community Consultative Committee (CCC) was established in early 2008 upon approval to the Stage 1 Project. The committee has met on a quarterly basis since then to discuss issues associated with the mine and any community concerns. The CCC will continue to meet on a quarterly basis throughout the mine life, in accordance with the requirements of the Project Approval.

### **4.2 Complaints Handling and Monitoring**

NM will:

- Establish and maintain a system for recording complaints with respect to construction and mining activities. A publicly advertised telephone complaints line will be utilised to receive complaints during operating hours and record complaints at other times;
- Ensure that all complaints are entered into a log book or similar database;
- Ensure that an initial response is provided within 24 hours of receipt of a complaint except in the event of complaints recorded when the mine is not operational; and
- Provide a report of complaints received every 12 months to DoPI, NSC, OEH, DRE and the CCC through the AR.

The NM complaints record will include the following details for noise complaints:

- The date and time of complaint;
- Any personal details the complainant wishes to provide or if no such details are provided a note to that effect;
- The nature of the noise that led to the complaint, including the time of the noise and its duration;
- The action taken by NM in relation to the complaint, including any follow-up contact with the complainant; and
- If no action was taken by NM, the reason why no action was taken.

### 4.3 Contingency Measures When Noise Complaints are Received

If noise levels of any item of plant or machinery exceed the levels outlined in **Section 2**, or if noise levels at any residence exceed the levels outlined in *Condition 4(1)*, advice will be sought from an appropriate acoustic consultant to verify the source of the elevated noise and identify options to address noise related impacts. Such actions may include:

- Additional testing to confirm the elevated noise is systemic in nature;
- Consideration to changes to operational procedure or equipment type; and
- The installation of sound attenuation measures to plant and equipment, where necessary, to ensure that noise emissions comply with the relevant noise levels in Section 3.

Where it is identified that the above options cannot achieve compliance with noise criteria, NM will undertake negotiations with the affected landowners with a view to entering into private agreements. Such negotiations would include options with regard to provision of insulation, double-glazing of windows, air-conditioning, or other measures designed to reduce noise impact at the affected property.

### 4.4 Best Practice Methodology

This NMP incorporates best practice techniques that includes:

- Identifying potential noise related impacts;
- Avoiding certain adverse times and weather conditions; and
- Field verification of predicted noise levels early in the life of the project.

These measures include specific use of real time noise monitoring to provide capacity for operational adjustments to achieve noise criteria, as well as determination of inversion impacts through continuous measurements. The community liaison program, complaints register and response methods and regular monitoring as identified in **Section 6** and **Appendix 1** in this document are all best practice procedures in the mining industry.

In addition to these techniques, and as outlined in the Section 75W modification and Stage 2 applications, an engineering based noise mitigation measure of utilising hard barriers to noise propagation paths may be utilised where necessary during drilling operations. The type of barrier to be used will be based on site specific requirements, and may include the use of shipping containers placed strategically around the drilling rig.

## 5 MONITORING AND REPORTING

Periodic (attended) and real-time (continuous) monitoring of noise levels is required in accordance with *Condition 4(4)* of PA 08\_0144, which is reproduced on Page 4 of this NMP.

### 5.1 Noise Monitoring Programs

Noise compliance monitoring will include attended monitoring at the residences identified on **Figure 2** and **Table 2** as well as real-time noise monitoring and temperature inversion monitoring. Temperature inversion monitoring will be undertaken continuously to verify impact of temperature inversions on noise compliance.

**Table 2 Noise Monitoring Locations**

Receiver Number	Land Owner
N1 – “Bow Hills”	J & R. Steiger
N3 – “Naroo”	M.W Foster
N4 – “Greylands”	M. & D. White
N5 – “Oakleigh”	C. Townes
N6 – “Newhaven”	K. & J. Scott
N7 – “Belah Park”	G. & C. Seville
N8 – “Haylin View” <sup>1</sup>	W. Chapman
N9 – “Merrilong” <sup>1</sup>	R. & S. Chappel

Note 1. Monitoring to commence as surface activities approach the eastern end of the southern longwall panels.

### 5.2 Attended Noise Monitoring

The attended monitoring will be undertaken on a quarterly basis (nominally January, April, July and October) with additional monthly monitoring during the winter months (May - September) for the first two years of operation. Subject to compliant noise levels during winter, the additional monthly monitoring during May, June, August and September would be discontinued in the third year of operations.

In circumstances where the attended monitoring program does not provide conditions conducive to validation monitoring (ie. wind speed and/or inversions outside the valid range of values in dot point 2 below Table 1 on page 6) an additional set of monitoring will be conducted at a time that covers those events, usually within one week of the previously scheduled monitoring event.

In circumstances where noise complaints are made relating to operations at the mine site, additional targeted noise investigations will also be undertaken at those receivers in order to assess and/or validate the complaint.

Attended noise monitoring events will also target assessment of low frequency noise, particularly during operations of the rail load out facility, and operation of the CHPP.

### 5.3 Real Time Noise Monitoring

In order to actively manage noise emissions onsite and to adequately comply with the requirement for reactive noise control measures, NM will continue to maintain, on site, a Sentinex real time continuous noise management system. The key features of a Sentinex type monitor are as follows:-

- Real time access to monitoring information;
- Universal user interface platform (web browser);
- Customised alarm settings;
- Automatic daily reporting;
- Streaming audio to PC; and
- Continuous audio recording (.mp3 format).

This system provides real time access to noise data, and provides the capacity to set the unit to a target noise goal. Upon noise emissions reaching the identified target level (set at below consent criteria level), an automated SMS message is delivered to operational personnel on site which triggers an investigation into the noise source, both through review of audio files, and on site knowledge of surface operations. Upon determination that the noise source is mine site related, active measures can be put in place to modify operations, or stand down the noise source to ensure compliance with noise criteria is maintained. Attended monitoring will also be used to ensure calibration of the monitor and to assess inversion related impacts.

Real time noise monitoring occurs on a 24 hour/7 day per week cycle with a portable monitor thereby enabling the monitor to be relocated to areas of potential greatest impact during the life of operations. It is expected that real time noise monitoring will be undertaken at those locations nominated in **Table 2**, but monitoring can also be extended to other residences in the event of noise related complaints or site activities that are identified as being of potential disturbance at other locations. The siting of the real time monitor will also give due regard to predominant wind direction at the time to ensure monitoring is undertaken in the quadrant of greatest impact at that time.

### 5.4 Temperature Inversion Monitoring

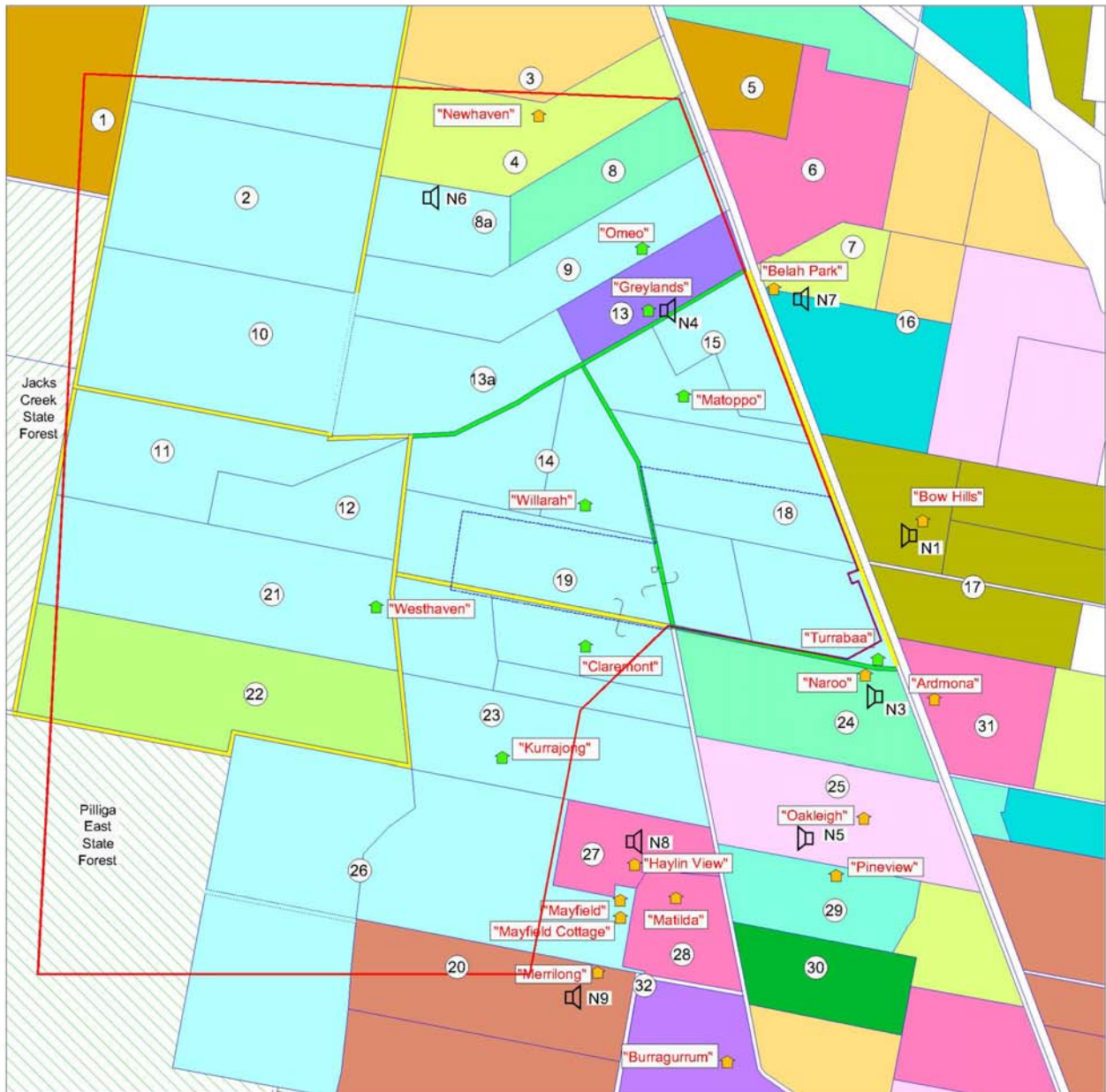
Temperature inversion monitoring will be undertaken continuously at the site by attaching temperature loggers at 2m above ground level to stakes located near "Naroo" (at RL 245m) and "Kurrajong" (at RL 310m). This method will provide an opportunity to assess inversion strength, the impact of the inversion on capacity to adhere to noise limits, and the capacity to adjust operations at surface during inversions if noise levels are identified outside consent limits. The use of this method as an effective measurement tool will be reviewed after 12 months of data collation.

## 5.5 Noise Monitoring Frequency

The frequency of monitoring for the various noise monitoring programs is nominated in **Table 3**. If conditions on the day of monitoring are not suitable (ie. high winds, rain, etc) then the monitoring event must be rescheduled to ensure ongoing compliance with monitoring frequency. The rescheduled monitoring will generally occur within one week of the original monitoring date.

**Table 3 Noise Monitoring Summary**

Type	Frequency	Responsibility	Comments
<b>Operational Noise</b>			
Attended noise surveys	Quarterly (monthly during May-September for the first two years)	Suitably Qualified Acoustical Consultant.	Noise monitoring methodology provided in Section 5 of NMP.
Temperature inversion surveys	Continuous.	NM or Suitably Qualified Acoustical Consultant.	Inversion monitoring methodology provided in Section 5 of NMP.
Real-time	Continuous but portable	NM or qualified Acoustical Consultant	Noise monitoring methodology provided in Section 5 of NMP.
<b>Noise Model Validation</b>			
Attended and real time noise surveys	Undertaken as part of operational noise monitoring	Suitably Qualified Acoustical Consultant	Survey will determine if predictions in the Environmental Assessment can be validated.
<b>Construction Equipment and Mobile Mine Equipment Sound Power Levels</b>			
Construction Machinery Noise	During construction activities and upon request from NM Manager	NM or qualified Acoustical Consultant	The sound power levels are to be recorded.
Mobile Mine Equipment	Reviewed opportunistically	NM Mine Manager and Individual Contractors approved by the Director-General.	The sound power levels are to be recorded.



LAND OWNERSHIP	
1 N. & F. King	18 Narrabri Coal Pty Ltd
2 Narrabri Coal Pty Ltd	19 Narrabri Coal Pty Ltd
3 A. & L. Grumley	20 R. & S. Chappel
4 K. & J. Scott	21 Narrabri Coal Pty Ltd
5 W. & A. Tick	22 D. P. B. & N. Gmearski
6 P. Smart	23 Narrabri Coal Operations Pty Ltd
7 G. & C. Sevil	24 M. W. Foster
8 J. & M. Bish	25 C. Towns
8a Narrabri Coal Operations Pty Ltd	26 Narrabri Coal Pty Ltd
9 Narrabri Coal Operations Pty Ltd	27 W. Chapman
10 Narrabri Coal Pty Ltd	28 W. Chapman
11 Narrabri Coal Operations Pty Ltd	29 C. & D. Kirkby
12 Narrabri Coal Pty Ltd	30 M. Thomas
13 M. & D. White	31 P. Webb
13a Narrabri Coal Operations Pty Ltd	32 G. & L. Stuart
14 Narrabri Coal Pty Ltd	
15 Narrabri Coal Pty Ltd	
16 C. Healion	
17 J. & R. Stieger	

REFERENCE	
	Mining Lease Boundary
	Pit Top Area
	Cadastral Boundary
	Residence (project related)
	Residence (non-project related)
	Crown Land
	Crown Road
	Council Road
	Property owned by NCOPL
	Noise Monitoring Location

SCALE 1:60 000



Figure 2 Noise Monitoring Locations

## 5.6 Noise Monitoring Procedures

Attended noise surveys will be conducted as follows:

1. All noise investigations will be carried out in accordance with the NSW Industrial Noise Policy, 2000 (INP), Environmental Noise Control Manual (ENCM) and applicable Australian Standards;
2. Noise levels will be measured in one-third octave bands using an instrument with IEC Type 1 characteristics as defined in AS 1259-1990 "Sound Level Meters". The instrument will have current calibration as per manufacturer's instructions and field calibration will be confirmed before and after measurements with a sound level calibrator;
3. The instrument will be set to A-weighting, "fast" response and measurements of  $L_{Aeq(15 \text{ minute})}$  will be taken at each location in **Table 2**. Each measurement will be stored at a sampling rate of no greater than 5 seconds for further analysis;
4. Attended surveys will be conducted during the approved hours of operation with at least three measurements taken during one 24-hour period at each location in **Table 2**, so that noise levels during the full range of operating times (day, evening and night) are monitored. Targeted monitoring will be included to ensure activities of rail loading and transport are assessed against compliance criteria. This will require pre-arranged monitoring to coincide with the occurrence of the activity;
5. Field notes will be taken during each measurement recording the time and duration of noise events, noise sources, instantaneous noise levels and the frequency range of identified site noise sources. Where an obvious noise exceedance is detected, the noise monitor must notify the mine manager of the exceedance and obtain relevant information as to the possible source of the exceedance, ie. malfunctioning equipment, additional activity contributing to noise levels etc to ensure appropriate reporting and action on the exceedance;
6. Extraneous noise sources will be filtered from the measured signal using robust methods approved by OEH and DoPI and the  $L_{Aeq(15\text{-minute})}$  level attributable to NM activities will be identified and compared with the relevant criteria; and
7. Details regarding plant configuration, survey interval, weather conditions (see below for inversion measurement methodology), extraneous noise sources, monitoring locations and times of measurement will be recorded for inclusion in the noise monitoring report.

Real-time noise monitoring will be conducted as follows:

1. A mobile real-time noise monitoring system utilising IEC Type 1 sound level meter with statistical and third-octave band capabilities will initially be located at one of the monitoring locations identified in **Table 2**. Site selection will be based on location of operational activity most likely to impact on that receiver;
2. The unit will calculate, as a minimum, 15-minute statistics comprising  $L_{A90}$ ,  $L_{Aeq}$  and  $L_{A10}$  and low-frequency filtered  $L_{Aeq}$  (nominal threshold 800Hz but able to be changed);
3. Each 15-minute statistic will have an accompanying third-octave band spectrum;

4. Statistical data and digital audio files (minimum duration one minute per 15 minute interval) will be continuously uploaded to the internet using an appropriate communications format;
5. A computer accessible to site personnel will display statistical results in real time via an internet browser and daily charts will be stored for later reference or printing;
6. Noise levels nominally 1 dB below site noise criteria will be set as trigger points in the real-time system to send pre-programmed SMS messages to relevant personnel;
7. On receipt of an SMS alert, audio files will be reviewed to determine the cause of the noise and, if necessary, the management safeguards and ameliorative actions in **Section 3** will be initiated; and
8. If the real-time noise monitor is situated at an attended monitoring location, both the attended and real-time results will be included in the attended monitoring report.

Temperature inversion monitoring be conducted as follows:

1. Two lightweight, fast response temperature loggers with nominally  $-30^{\circ}$  to  $+50^{\circ}$  temperature range and standard external sensor will be used to directly measure the air temperature at two points above ground level;
2. The logger will be set to measure air temperature at 5-minute intervals and be attached to a stake at 2m above ground level at the "Naroo" southern boundary (RL 245m);
3. Simultaneously, a second temperature logger will be attached to a stake at 2m above ground level at the "Kurrajong" property (RL 310m);
4. The temperature loggers will be permanent and monitor continuously;
5. Temperature data will be interpreted to determine the temperature differential between the two heights and extrapolated to give the temperature lapse/inversion strength as a value per 100m;
6. Where it is determined that a temperature inversion is impacting on noise levels whereby exceedances in noise criteria are observed, the Environmental Officer will be contacted immediately to ascertain appropriate practical measures on site that may bring noise levels during the inversion event back to compliance; and
7. Temperature gradient data coinciding with attended monitoring events will be included in the tables of results in the attended monitoring report.

Temperature inversions generally occur under low wind speeds as higher wind speeds cause turbulent mixing of the layers of air above the ground surface. As a consequence, wind speed and direction parameters from the site meteorological station will be used to determine if suitable conditions exist to determine inversion strength.

## 5.7 Reporting

The Environmental Officer will review the results of attended noise monitoring and in accordance with *Condition 6(4)* of Project Approval 08\_0144, report any incident of exceedance in noise criteria within 24 hours of detecting the exceedance to the DoPI and OEH. Within 7 days of providing this notification, NM will provide those agencies with a written report identifying the date, time and nature of the exceedance, identify the cause or likely cause of the exceedance, describe actions taken in relation to the exceedance, and identify any measures being undertaken to minimise the risk of future exceedance of noise criteria. Any exceedance in noise criteria will also be reported in the Annual Review (AR).

The results of the monitoring program will also be made available on NM's website and updated on a regular basis, as required under consent *Condition 6(5)* of PA 08\_0144, and via monitoring reports presented at CCC meetings.

## 6 SITE IMPLEMENTATION

### 6.1 Roles and Responsibilities

During the operational phases of the development, the Narrabri Coal Mine will be managed by the General Manager who will have overall responsibility for ensuring contractors, employees and service providers comply with all laws, regulations, licences, approvals and conditions of the project approval.

All significant contractors will be required to undertake an environmental risk assessment and undertake site induction training prior to commencing works on site. At this time they will also be instructed in the environmental standards, procedures and processes applicable whilst they are on the site and the requirement for any equipment to be fitted with appropriate attenuation measures in order to achieve the nominated sound power levels specified in this noise management plan.

**Table 4** outlines the various roles and responsibilities required under this NMP.

**Table 4: Roles and Responsibilities**

<b>Role</b>	<b>Responsibilities</b>
General Manager	<ul style="list-style-type: none"> <li>• To authorise this NMP.</li> <li>• Ensure adequate people and resources are allocated to enable this protocol to be effectively implemented.</li> </ul>
Mine Manager	<ul style="list-style-type: none"> <li>• Ensure that the NMP is implemented, reviewed and modified as required.</li> <li>• Ensure that the audit and review mechanisms of the plan are adhered to and non-compliances and inadequacies are rectified.</li> <li>• Authorise changes to the NMP to be sent to the General Manager for final approval.</li> </ul>
Technical Service Manager	<ul style="list-style-type: none"> <li>• Ensure that people under his charge who have duties and responsibilities under the NMP undergo training and assessment in those duties.</li> <li>• Provide support and guidance to the Environmental Officer as required.</li> </ul>
Environmental Officer	<ul style="list-style-type: none"> <li>• Be responsible for administering and implementing the NMP.</li> <li>• Maintain an updated register and plan of all properties affected by the project.</li> <li>• Check to ensure that all Noise Control Measures are in place and are up to standard.</li> <li>• Co-ordinate all noise monitoring activities.</li> <li>• Analyse output from noise monitoring exercises.</li> </ul>

Role	Responsibilities
	<ul style="list-style-type: none"> <li>• Follow up on any non conformances or complaints at the first available opportunity - investigate incidents and co-ordinate appropriate action to restore conformance.</li> <li>• Report any non-conformances immediately to the Technical Services Manager then to the DoPI, and OEH within 24 hours and subsequently provide them with a written report within 7 days.</li> <li>• Data base all monitoring information and fully document incidents.</li> <li>• Communicate monitoring results and non conformance incidents to key stakeholders including the CCC and via the NM Website.</li> <li>• Prepare and present Noise Management awareness training to the workforce.</li> <li>• Prepare and submit Annual Review (AR).</li> </ul>
Control Room Operators, Receptionist	<ul style="list-style-type: none"> <li>• Bring to the attention of the Environmental Officer all noise related complaints at first available opportunity.</li> </ul>
Workforce	<ul style="list-style-type: none"> <li>• Shall maintain an awareness of noise related issues and report any possible non conformances to the Environmental Officer.</li> </ul>
Acoustical Consultant	<ul style="list-style-type: none"> <li>• Undertake monitoring and reporting activities as directed by the Environmental Officer.</li> </ul>

## 6.2 Training and Competencies

All training, competency assessment and maintenance of training records in relation to the Plan must be conducted in accordance with the requirements of the Training and Competency Management Plan.

The Training and Competency Management Plan defines the induction and training requirements for each classification of employee based on the type of work and the work environments that each classification is exposed to.

## 6.3 Communication

Communication of information related to the Noise Management Plan must be conducted and recorded in accordance with the requirements of the Information and Communication Arrangements Standard.

## **6.4 Plan Monitoring and Corrective Action**

### **6.4.1 Audits**

The audit process and the completion and retention of audit records will be conducted in accordance with the requirements of the Audit and Review Standard.

The Environmental Officer will ensure that an internal audit of the Plan is conducted every 2 years and that an external audit is carried out at intervals outlined in Project Approval 08\_0144.

### **6.4.2 Reviews**

The review process and the retention of review records will be conducted in accordance with the requirements of the Audit and Review Standard. The Environmental Officer will ensure that a review of the Plan is conducted every 2 years, and following any event based trigger identified in the Audit and Review Standard that is relevant to the implementation of the Plan.

### **6.4.3 Plan Monitoring Generally**

In addition to the formal means of monitoring the performance of the Plan by scheduled audit and review, every person who performs a function defined by the Plan also has a responsibility to monitor the performance of the Plan and to bring to the attention of the Environmental Officer any non conformance, deviation or potential improvement of which they may become aware.

### **6.4.4 Corrective Action**

Where monitoring of the Plan identifies the need for corrective action to be taken, the Environmental Officer will prepare a corrective action plan. Preparation of the plan may require the assistance of a specialist acoustic consultant. Details on the preparation of the corrective action plan will be included in the relevant AR and Environment Protection Licence Annual Return and to OEHL prior to implementation.

## **6.5 Document Control**

The Plan will be maintained in accordance with the mine's document control system:

- the master copy will be maintained electronically on the mine server;
- where alterations to the Plan are required, such as following formal review, the Document Controller will update the master copy and notify the Document Owner of the alteration; and
- the Document Controller will be the only person with access to the master copy for the purpose of making alterations.

Copies of the Plan printed from the mine server must be considered to be uncontrolled copies.

## **6.6 Retention of Records**

The assigned persons will ensure this NMP and associated records are retained on file at the mine for a period of least 5 years.

## 7 REFERENCES

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- Environmental Protection Authority (EPA) (1994), *Environmental Noise Control Manual (ENCM)*, NSW Government
- Environmental Protection Authority (EPA) (2000), *Industrial Noise Policy*, NSW Government
- Narrabri Coal Mine – Stage 1 Project Approval (PA) 05\_0102 and Statement of Commitments
- Narrabri Mine – Stage 2 Project Approval (PA) 08\_0144 and Statement of Commitments
- R.W. Corkery and Co Pty Ltd (2007), *Narrabri Coal Project: Environmental Assessment*, Prepared for Narrabri Coal Pty Ltd
- R.W. Corkery and Co Pty Ltd (2009), *Narrabri Coal Mine Stage 2 Longwall Project: Environmental Assessment*, Prepared for Narrabri Coal Operations Pty Ltd
- Spectrum Acoustics Pty Ltd (2007), *Narrabri Coal Project, Noise and Vibration Assessment (Specialist Consultant Studies Compendium Volume 2, Part 7)*, Prepared for Narrabri Coal Pty Ltd
- Spectrum Acoustics Pty Ltd (2009), *Narrabri Coal Mine Stage 2 Longwall Project, Noise and Vibration Impact Assessment (Specialist Consultant Studies Compendium Volume 2, Part 6)*, Prepared for Narrabri Coal Operations Pty Ltd

# **Appendix 1**

## **Noise Monitoring Protocol**

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**Narrabri Coal Mine – Noise Monitoring Protocol**

<b>Control/ Action</b>	<b>Timing / Trigger</b>	<b>Responsibility</b>	<b>Monitoring</b>	<b>Reporting</b>
NM and all contractors will provide environmental training on noise control and awareness for all personnel and sub-contractors.	This training will take place before the commencement of work by any employee, contractor, or sub-contractor whose work is likely to create loud noise.	NM Manager or nominated representative / Individual Contractors.	This awareness training will be incorporated into site inductions.	The effectiveness of this control will be monitored by the Environmental Officer and will be reported annually in the AR.
Potentially affected residents will be notified prior to potentially noisy activities and will be kept informed during the construction phase.	One week prior to potentially noisy phases of activity being undertaken or within a lesser period agreed to by the resident(s).	NM Manager / Environmental Officer	The effectiveness of this control can be determined in the community consultation process.	The effectiveness of this control will be reported annually in the AR.
Machinery to be used during construction will be required to satisfy maximum sound power levels as specified in Table 1.	On entry to site and on request from NM Manager.	NM Manager, Individual Contractors	Validation testing. Upon request by NM Manager.	Sound power levels of all machinery tested will be recorded.
Mobile mining equipment will be required to satisfy maximum sound power levels as specified in Table 1.	Mobile mining equipment used on site must be certified as compliant with the relevant noise standard and will be tested on site entry	NM Manager, Individual Contractors	Mobile mining equipment noise levels will be reviewed opportunistically.	Sound power levels of all mining equipment will be recorded.
Site equipment will be selected so as to have the lowest practical level of sound emission and will be maintained in good order.	This will be a continual process.	NM Manager, Individual Contractors.	Noisy equipment is to be highlighted in regular inspections of operations and noise monitoring programs.	The effectiveness of this control will be reported annually in the AR.
Due attention will be paid to adverse weather conditions, so that modifications can be made to the work program where necessary. A real time link between meteorological station and the site control room will be created advising of adverse meteorological conditions.	This will be a continual process.	NM Manager, Individual Contractors	On-site meteorological station will highlight adverse conditions. The effectiveness of this will also be determined in the community consultation process.	The effectiveness of this control will be reported annually in the AR.
All reversing alarms will be of the broadband type.	Before use of machinery on site.	NM Manager and Individual Contractors.	General monitoring and observation by NM personnel to ensure all alarms on site are of the broadband type	The effectiveness of this control will be reported annually in the AR.
All complaints will be registered and responded to in accordance with the complaints procedure in the NMP.	Whenever a complaint is received.	NM Manager	This control will be monitored in the complaints handling and follow-up process.	The effectiveness of this control will be reported annually in the AR.

<b>Control/ Action</b>	<b>Timing / Trigger</b>	<b>Responsibility</b>	<b>Monitoring</b>	<b>Reporting</b>
Monitoring of emitted noise levels will be undertaken to verify compliance with noise criteria and to assess the need for additional noise attenuation measures.	On a quarterly basis for attended monitoring and on a continuous basis by real time noise monitor.	NM Environmental Officer and Mine Manager.	By suitably qualified acoustical consultant or trained NM employee approved by the Director-General.	Monitoring results and the effectiveness of any controls used will be reported in the relevant AR.
Monitoring of emitted noise levels will be undertaken monthly during winter months to verify compliance with noise criteria under temperature inversion conditions and to assess the need for additional noise attenuation measures.	Monthly during May - September for first 2 years of operations and extended if necessary	NM Environmental Officer and Mine Manager.	By suitably qualified acoustical consultant or trained NM employee approved by the Director-General.	Monitoring results and the effectiveness of any controls used will be reported annually in the AR.
Monitoring of temperature inversion incidence and strength will be undertaken continuously by use of temperature loggers attached to stakes at specified heights.	This will be a continual process..	NM Environmental Officer and Mine Manager.	By suitably qualified acoustical consultant or trained NM employee approved by the Director-General.	Monitoring results and the effectiveness of any controls used will be reported annually in the AR.

# **Appendix 2**

## **Agency Consultation**

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**Steven Farrar**

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**From:** Turnbull Kharl [Kharl.Turnbull@environment.nsw.gov.au]  
**Sent:** Thursday, 29 September 2011 3:00 PM  
**To:** Steven Farrar  
**Cc:** OHern Robert  
**Subject:** Narrabri Mine Stage 2 Development Consent

Hi Steven

As just discussed, thank you for forwarding the following Management Plans for our records:

- Narrabri Mine Stage 2 Energy Savings Action Plan
- Narrabri Mine Stage 2 Landscape Management Plan
- Narrabri Mine Stage 2 Noise Management Plan
- Narrabri Mine Stage 2 Aboriginal Cultural Heritage Management Plan
- Narrabri Mine Stage 2 Air Quality Monitoring Plan
- Narrabri Mine Stage 2 Water Management Plan

The Office of Environment and Heritage (OEH) encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, we do not approve or endorse these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives.

Should you have any further enquiries please do not hesitate to contact me.

Regards

Kharl Turnbull  
Regional Programs Officer  
Environment Protection and Regulation Group  
Office of Environment and Heritage  
Department of Premier and Cabinet  
PO Box 494 (85 Faulkner St) | Armidale NSW 2350  
Phone (02) 6773 7000 | Fax (02) 6772 2336

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