



ABM RESOURCES NL
NOISE MANAGEMENT PLAN
October 2013

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1. DEFINITIONS

dBA - 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
EMP	Environmental Management Plan
LA90	Background Noise – The A-weighted sound pressure level that is exceeded for 90 percent of the time over which a given sound is measured
LAeq	The equivalent continuous noise level - the level of noise equivalent to the energy average of noise levels occurring over a measurement period
Non – compliance	The site is deemed to be in non-compliance with its noise consent/licence conditions if the monitored noise levels exceed its statutory noise limit by more than 2 dB
LAeq (15 minute)	Average continuous noise levels for a 15 minute period
NT EPA	Northern Territory Environmental Protection Authority
RBL	Rating Background Level

2. COMMITMENT AND POLICY

2.1 Purpose

ABM is committed to ensuring a safe and healthy working environment for all personnel working at the Twin Bonanza mine site. This Noise Management Plan (NMP) relates directly to the Twin Bonanza mine site and surrounding Mineral Lease 29822. The principals of management relate both to noise and vibration, and as such this document covers both aspects.

The purpose of the NMP is to provide an effective management system to identify and control potential noise impacts. This will enable compliance with legislation and regulatory requirements applicable to mining within MLA29822 and to reduce the noise impact from the mining, processing and accommodation areas on ABM staff. Additional receptors are limited as the closest permanent settlement is Balgo which is located 120 km to the west of the site, local populations of native fauna may be considered a receptor for the purposes of this document.

Potential noise sources above existing environmental noise include:

- noise produced by mobile equipment during operations
- noise produced by fixed plant including crushers, ball mill and other process plant
- power generator noise
- open pit blasting noise and vibration
- the landing and takeoff of aircraft from the airstrip.

Potential impacts from noise emissions and vibrations associated with the project are expected to be minimal. The remote location of the project and the absence of nearby residential facilities will limit any adverse impacts.

2.2 Scope and legislation

This NMP has been created to assist in compliance with the Work Health and Safety (NUL) Act 2011 under Division 2 Primary Duty of Care and Relevant Regulations and codes of practice, and has been requested as part of the Environmental Impact Statement (EIS) by the Northern Territory Environmental Protection Authority (NT EPA). As part of this role the NT EPA is the Adminstrating Agency of the Northern Territory's *Waste Management and Pollution Control Act* (the Act). Section 83 of the Act provides for general environmental offences, including that a person must not create an environmental nuisance. Section 4 of the Act defines environmental nuisance as:

An adverse effect on the amenity of an area that:

1. is caused by noise, smoke, dust, fumes or odour
2. unreasonably interferes with or is likely to unreasonably interfere with the enjoyment of the area by persons who occupy a place within the area or are otherwise lawfully in the area.

In the absence of defined criteria the Queensland Environmental Protection (Noise) Policy 2008 has been adopted.

Additionally, relevant regulations and codes of practice that ABM will align themselves to are outlined below;

- *NOHSC:1007 (2000) - National Standard for Occupational Noise.*
- *AS/NZS 1269.3:2005 - Occupational noise management – hearing protector program*
- *LPSD - Airborne Contaminants, noise and vibration (Commonwealth)*
- *Code of Practice- NT WorkSafe – Managing and preventing hearing loss at work*

The Workplace Health and Safety Regulations set the exposure standard for noise at an LAeq,8h of 85 dB(A) and a peak noise level at 140 dB(C), which protects most but not all people. Therefore, workplace noise should be kept lower than the exposure standard for noise if reasonably practicable. ABM will provide hearing protection for all staff when required.

3. Consultation

ABM if required will consult with employees, contractors, and regulatory authorities (assessed on a case by case basis), when a decision is to be made that may affect noise management at the Twin Bonanza mine site and accommodation facilities. Examples of situations requiring consultation include, but are not limited to:

- changes to work environments, work methods, work systems, or equipment which may significantly alter noise impacts (e.g. blasting times will be set by operative requirements)
- periods of blasting
- undertaking, or reviewing risk assessments and implementing controls
- undertaking a Job Safety Analysis (JSA) and Job Hazard Analysis (JHA) for new tasks
- investigating incidents and complaints.

3.1 Employees and contractors

Consultation with employees and contractors under the NMP may be through the following methods;

- reviews of this management plan
- tool box and safety meetings
- risk assessments
- incident / accident investigations.

3.2 Regulatory authorities

ABM will communicate on relevant noise management aspects of the mine's operation as part of any reporting requirements under the NT EPA and as part of the annual Mining Management Plan pursuant to section 40 of the *Mining Management Act 2001*.

4. RISK ASSESSMENT

It is acknowledged that the proposed mining operation will introduce a level of noise and vibration that does not currently exist at the site. While noise from mining operations will be present in this sparsely populated and remote region, noise emissions will be inaudible at the nearest residential area of Balgo and Coyote minesite located 120km and 45km respectively from the project. As the most sensitive receptors on site will be the workforce and native fauna, rather than undertake noise modelling, surveys will be completed as the site is developed.

During project implementation a noise risk assessment considering the sources and levels of noise will be conducted. This risk assessment will identify the risks associated with the different

aspects of the mine with regards to noise impacting on the workforce and native fauna. As no prescriptive guide is given under the *Waste Management and Pollution Control Act* the acoustic quality objectives from the Queensland Environmental Protection (Noise) Policy 2008 will be adopted for the purposes of the risk assessment. This policy seeks to protect the biodiversity of ecosystems and human health and wellbeing.

Where a risk exists to personnel and fauna a hierarchy for noise control will be adopted that will attempt to avoid, minimise, or manage noise.

5. RISK MANAGEMENT - OPERATIONAL CONTROL

As discussed above, ABM environmental manager with a suitably qualified person will complete a noise risk assessment. This risk assessment will result in the establishment and implementation of both the management and operational controls to mitigate the effect of noise and vibration at the mine site, and the accommodation area.

The following are some of the management and control strategies that will be implemented at the Twin Bonanza Mine and accommodation camp to reduce noise impacts on staff, external stakeholders and fauna.

5.1 Construction phase

Construction noise emitted from the project is assessed with consideration to the NT EPA Noise guidelines for development sites in the Northern Territory (NT EPA 2013). The NT EPA recommends standard hours for construction activity between 7 am to 7pm Monday to Saturday and on Sundays 9am to 6pm. Given the location of the mine site and the large distance between sources and residential receptors, extended working hours are not expected to present a noise issue; and construction generally will be completed at the mine site between the hours of 6.30am and 6.30pm, 7 days a week.

The NT EPA provides a noise limit for construction noise levels at residential receptors / residential area uses during standard hours for construction. NT EPA set the construction noise limit at background noise + 5dB(A). These noise limits are calculated based on the adopted rating background level (RBL) at nearby residential locations. As the mine accommodation will be located 1km from construction activities that will occur from 6.30am to 6:30pm, noise will not exceed the construction noise limit.

During construction when employees and contractors are involved in tasks that exceed occupational health and safety limits for noise (above LAeq,8h of 85 dB(A)) they will be required to wear hearing protection that meet Australia Safety Standard in accordance with AS/NZS 1269.3 Occupational noise management – hearing protector program.

5.2 General operations

ABM staff and contractors will insure the equipment is maintained to reduce noise emissions which would impact on workers and fauna. Where required, the use of suitable hearing protection equipment will be provided and is to be worn by all personnel while in hearing protection areas. Appropriate signage under the Australian Standards will designate hearing protection areas. Workers, visitors and sensitive fauna are the primary receptors given that there are no residential areas or communities in the area.

NT Worksafe PPE requirements are detailed below:

Regulation 46: Personal hearing protectors, such as ear-muffs or ear-plugs, should be used in the following circumstances:

- when the risks arising from exposure to noise cannot be eliminated or minimised by other more effective control measures,
- as an interim measure until other control measures are implemented
- where extra protection is needed above what has been achieved using other noise control measures.

Areas where people may be exposed to hazardous noise should be sign-posted as hearing protector areas and the boundaries of these areas should be clearly defined. Workers and other persons, including managers and visitors, should not enter these areas without wearing appropriate personal hearing protectors, regardless of how short the time they stay in the hearing protector area.

Personal hearing protectors should be selected and maintained in accordance with *AS/NZS 1269.3 Occupational noise management – hearing protector program*.

ABM's health and safety staff and section managers (i.e processing, environmental) will be responsible for compliance with the *AS/NZS 1269.3 Occupational noise management – hearing protector program* guidelines.

ABM will establish a maximum practicable distance between accommodation units and power generators. Physical bunds will be placed around mining and camp infrastructure including power generators (e.g. gensets) that will generate significant noise disturbance during operation, with the aim to reduce excessive noise disturbance to receptors.

Where practicable, equipment (both fixed and mobile) will comply with *AS/NZS 1269.3:2005 - Occupational noise management* in regard to design and operating noise levels. It is the duty of the supplier to ensure equipment is compliant with safe levels of noise and vibration and must provide documented proof of compliance, such as test results. Employees will be trained in the appropriate use and application of machinery to minimise noise emissions as far as practicable.

ABM will maintain a complaints registrar. All legitimate noise and vibration complaints will be investigated and appropriate actions taken. The NMP shall be prepared and implemented to the satisfaction of NT EPA and Workplace Health and Safety NT. Where practicable ABM will also position infrastructure including waste dumps to form noise barriers around stationary plant and locate administration buildings away from noise sources.

5.3 Shot firing / blasting

Noise and vibration from shot firing will be present during operations, all shots will be planned and designed to achieve the required outcomes with minimal impacts on workforce, community and fauna.

The Australian and New Zealand Environment and Conservation Council (ANZECC) *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC 1990) provides guidance when dealing with potential blasting noise and vibration. This guidance applies to sites close to residential areas. Twin Bonanza is not close to residential areas and ABM will monitor and listen to any complaints made regarding blasting noise.

Recommended ANZECC Blasting Limits for air blast overpressure and noise are 115 dB(lin) peak, however the level of 115dB may be exceeded on up to 5% of the total number of blasts over a period of 12 months, but never over 120dB(lin) peak. Ground Vibration Limits are set at 5mm/s peak particle velocity, although the level of 5mm/s may be exceeded on up to 5% of the total number of blasts over a period of 12 months, but never over 10mm/s. Blasting safety and responsibility for the noise and vibration effects from the blasting will be the qualified blasting personnel. ABM will monitor and comply as practicable.

The mine manager or delegate will be responsible for notifying all staff and visitors of the blast schedule and will schedule such blasts to coincide close to the change in shifts, approximately 6 pm, (night / day shift) to prevent disturbance to night shift workers sleep patterns. This is in line with ABM's fatigue management policies. Appropriate Personal Protective Equipment (PPE) will be made available.

Shots will not be fired during the middle of the day when bilby are at their least active (asleep, unless in the event of re-blasting / clearing of existing holes, scheduling of blasts will align with the change of shift which will be close to the evening or dawn (6pm), when both nocturnal and diurnal fauna will be active and less disrupted. The aim is to prevent disturbance to nocturnal and diurnal animals alike, particularly the bilbies and mulgaras which are situated locally. The aim is to reduce the impact on fauna activities and habitats.

6. RISK MANAGEMENT – Biodiversity and native fauna

There are no government policies or widely accepted guidelines with regard to noise criteria for fauna; however the effect of noise on wildlife can be similar to the effects observed in humans.

Noise can adversely affect wildlife by interfering with communication, breeding activities, cause stress or avoidance reactions and (in the extreme) result in temporary or permanent hearing damage.

Experiments with noise impulses throughout the night-time sleep period of animals resulted in poorer daytime task performance and learning ability of those animals (Fletcher and Busnel 1978). The animal's initial reaction to a new noise source is fright and avoidance but if other sensory systems are not stimulated (for instance optical or smell), the animal learns quite quickly to ignore the noise source, particularly when it exists in the presence of humans. These findings are supported by personal communication with Jeremy Shepherdson (comms 2013 Principal Ecotec Proprietary Limited) and Dr Richard Southgate. Doctor Southgate, one of Australia's more foremost bilby experts noted that: "Bilbies can tolerate disturbance. For example, bilby activity occurred along part of the easement for the Ghan Railway line north of Tennant Creek during the construction phase and they have continued to occur near the railway line." (Southgate, 2012). Bearing this in mind, blasting and shot firing has the potential to cause the most noise and vibration disturbance to local fauna, and as such ABM have provided for management of blasting at times to coincide with animal activity (both nocturnal and diurnal) with the aim to reduce the impact of fauna activities. Additionally, where practicable establish the greatest possible distance between noise sources and potential bilby and mulgara habitat, with the aim to reduce excessive noise disturbance.

7. INFORMATION & COMMUNICATION

7.1 Internal information and communication

Key avenues for internal communication on environment and community aspects or concerns of operations will be maintained mainly through meetings. Additionally, ABM will implement the following methods of communication with the workforce and employees;

7.1.1 Accident / incident report

In the event of a noise complaint, ABM personnel including contractors are to attempt to stop the source of the noise, or control the source of the noise. If they can't control the incident then they are to report the incident to their supervisor.

A record is to be taken as per the “ABM Incident Reporting and Investigation System”. The health and safety manager, and environmental manager are to be notified of the incident as soon as possible to assist in determining actions and to inform the mine manager of the incident.

Incidents which may occur that relate to the NMP include:

- noise complaints & enquiries
- results of surveys
- noise levels produced by defective noise reduction systems
- unplanned vibration caused by blasting.

7.2 External information and communication

7.2.1 External complaints

ABM will respond to any community inquiries or complaints received as described in the ABM Incident Report and these will be recorded on the appropriate register. All external complaints will be investigated by the environmental manager or health and safety manager and when required actions taken to resolve the matter. Upon finalisation of the investigation and implementation of any required management measures a response will be provided to the party that has lodged the complaint. The response will detail the findings and course of action taken.

7.2.2 Government departments

If a reportable incident occurs ABM will notify Work Safe (if health and safety related) and the NT EPA of the incident as soon as practicable after the incident. Workplace Health and Safety NT require an incident notification form to be emailed or faxed as soon as possible.

Contact details for both organisations as follows:

Workplace Health and Safety NT

Fax: 8999 5141

Telephone: 1800 019 115

Incident Notification form: <http://www.worksafe.nt.gov.au/Forms/Notifications/FM137.pdf>

Email: ntworksafe@nt.gov.au

Environmental Operations

NT Environment Protection Authority

GPO Box 3675

Darwin NT 0801

Email: Environmentops.@nt.gov.au

7.2.3 Central Land Council

As part of ongoing consultation and engagement with the Central Land Council information will be provided on any issues or incidents that have been the result of excessive site noise and vibrations.

7.2.4 Responsibilities

The NMP will be implemented by the ABM health and safety manager and environmental manager with the assistance of ABM staff and qualified contractors. It is the responsibility of the ABM managers to maintain, audit and review the monitoring program.

This plan will be implemented in the induction for all staff and contractors.

8. MONITORING

8.1 Noise monitoring

Noise at Twin Bonanza Mine site and accommodation facilities will be monitored in the following ways.

8.1.1 Monitoring

Monitoring will incorporate:

- Regular review of the number, frequency and type of noise and vibration complaints. During the review examine the potential trends that may be developing and implement mitigation measures, if required.
- A complaint form will be available and a register of all complaints will be available.
- Regular inspections of the workplace and discussions with the workforce via, toolbox and safety meetings to identify any noise hazards that require action or control measures.
- Monitor the maintenance of mobile and fixed plant to ensure noise emissions are maintained at an acceptable level.
- Monitor that the implemented control measures are not resulting in noise hazards.

Specifically monitoring and maintenance of onsite machinery will focus on checking for changes in noise levels – badly worn bearings and gears, poor lubrication, blunt blades, loose parts, unbalanced rotating parts and steam or air leaks all create noise that can be reduced with good maintenance. Engineering controls such as vibration mountings, impact absorbers, gaskets, seals, silencers, barriers and other equipment. Regular inspection and maintenance will be conducted in accordance with the WorkSafe Code of Practice – Managing and preventing hearing loss at work.

8.1.2 Community / social monitoring

ABM Resources will monitor social impacts of its operations by recording and trending complaints over time by entering these in the complaints register and reviewing the nature of complaints on an annual basis. This will assist in determining the environmental aspects of the complaint and requirement for additional controls or management strategies to limit the noise impacts.

8.2 Reporting

8.2.1 Legislative reporting

Complaints and enquiries for the calendar year will also be reported in the Mining Management Plan under the *Mining Management Act 2001* and if required under the *Waste Management and Pollution Control Act*.

8.3 Record keeping

8.3.1 Noise monitoring

Details of all noise complaints and investigations will be kept to assist in monitoring compliance with this management plan.

8.3.2 Register of external communication

A register of all external communications relevant to mine's operations will be maintained in ABM's Incident and Complaints Register. Community complaints and inquiries will be registered recording details such as the date, time, complainant/inquirer name and address, information about the complaint or inquiry, response and corrective actions.

9. AUDIT

The objectives of an audit are to maintain compliance with the NMP.

9.1 Internal audits

Internal audits of the ABM NMP will be conducted annually or as new machinery with potential to exceed allowed noise levels are introduced to the mine site or accommodation area.

9.2 External audits

Independent audits of the NMP shall be conducted as requested by government regulators.

10. REVIEW

Revisions are to be coordinated by the environmental manager or as requested by the site general manager. The objectives of a review are to:

- maintain compliance with the statutory requirements
- identify opportunities for improvement in the Management Plan
- consider community and employee feedback on the NMP.

11. REFERENCES

Department of State Development, 2013, *Browse LNG Precinct Environmental Assessment: Bilbies*. Published April 2013. MPAPR13_2462. Government of Western Australia. Available from: < <http://www.dsd.wa.gov.au/documents/002211.browselng.pm.pdf>>. [8 August 2013].

Fletcher, JL, & Busnel, RG 1978, *Effects of Noise on Wildlife*, Academic Press, London.

Southgate, R., 2012, *Peer review of the Browse Bilby Review, a report detailing the consolidated information relating to the occurrence of the Bilby *Macrotis lagotis* near the proposed Browse LNG Precinct (close to James Price Point) and more broadly on the Dampier Peninsula*. Available from: <http://www.epa.wa.gov.au/EIA/EPAReports/Documents/1444/Appendix_7/1444-BROWSE2.PDF>. [8 August 2013].

The Australian and New Zealand Environment and Conservation Council (ANZECC), 1990, *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*. Available from: < <http://www.environment.nsw.gov.au/resources/noise/ANZECBlasting.pdf>>. [8 August 2013].

Legislation

- *Work Health and Safety (National Uniform Legislation) Act 2011* (NT) under Division 2 Primary Duty of Care
- *Waste Management and Pollution Control Act 1998* (NT)

Codes of Practice and guidance material

- *NOHSC:1007 (2000) - National Standard for Occupational Noise*.
- *AS/NZS 1269.3:2005 - Occupational noise management – hearing protector program*
- *LPSD - Airborne Contaminants, noise and vibration*
- *Code of Practice- Worksafe – Managing and preventing hearing loss at work*

12. CONTROL AND REVISION HISTORY

12.1 Document information

PROPERTY	VALUE
Approved by	Chief Operating Officer
Document Owner	Environmental Manager
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12.2 Revisions

VERSION	DATE REVIEWED	REVIEW	NATURE OF THE AMENDMENT
1	30/08/2013	R. Richards	Initial Issue
2	11/10/2013	B. Valiukas	Revision
3			
4			

12.3 Read by

	NAME	DATE	SIGNED
1	Pascal Hill	29/08/2013	
2	Alwin van Roij	29/08/2013	
3			
4			