

CHAPTER 14- Environmental management plan

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14.1 Introduction

14.1.1 Purpose and Scope

This Environmental Management Plan (EMP) has been prepared to address the requirements of the Twin Bonanza Environmental Impact Statement (EIS). Preparation of this document is in accordance to leading practices with reference to AS/NZS ISO 14001:2004 and in keeping with regulatory requirements. The EMP and related documents apply to all aspects of the projects construction, operation and decommissioning.

The purpose of this strategic document is for the facilitation of environmental management measures to minimise the environmental risks associated with the project and to protect the environment. More specifically the EMP:

- details environmental management designed to meet environmental objectives and outcomes
- provides a framework for effective implementation of environmental management
- defines roles and responsibilities for environmental management and compliance
- ensures ongoing review of site specific environmental management and mitigation measures to affect continuous improvement in environmental management.

ABM Resources NL (ABM) aims to conduct its business in an efficient and environmentally responsible manner, meeting the expectations of its community, shareholders and relevant government agencies. This EMP will be an evolving document over time to reflect changes in current knowledge and project dynamics.

This chapter serves as the EMP for the Twin Bonanza 1 project and a stand-alone EMP for the mine will be written following the submission of this EIS. Until that time this chapter will serve as the EMP for the company. Existing environmental management plans for exploration and bulk sampling are already in place.

14.1.2 Environmental management

This EMP addresses requirements of the Final Guidelines for the Preparation of an Environmental Impact Statement. Commitments within the EMP are measurable and auditable; they set objectives, standards and measurable indicators, and include control strategies/actions to facilitate achievement of the objectives.

This EMP is the over-arching document; however, the EMP is supported by the following management plans:

- Mining Management Plan

- Water Management Plan
- Conceptual Mine Closure Plan
- Weed Management Plan
- Social Impact Management Plan
- Cultural Heritage Risk Management Plan
- Fire Management Plan
- Noise Management Plan
- Emergency Response Management Plan
- Biting Insect Management Plan
- Air Quality Management Plan
- Biodiversity Management Plan

This EMP covers the Twin Bonanza mine. The environmental values, impacts, commitments and conditions apply to ABM Resources Mineral Lease 29822. The EMP applies to all consultants and subcontractors in designing and constructing the Twin Bonanza mine and facilities.

ABM's environmental policy is as follows:

ABM Resources NL acknowledges that it conducts mineral exploration and mining on land owned by Traditional Owners and that ABM's access to this land is guided through processes with the Central Land Council. ABM is committed to a close working relationship with the Central Land Council, the communities and the Traditional Owners. ABM is committed to offer employment opportunities to people in local communities and the promotion of knowledge, understanding and respect for Indigenous Australians traditions and culture.

ABM is committed to responsible exploration, development, operations and closure. ABM is focused on conducting its business in harmony with stakeholders' and the wider community's desire to conserve and protect the natural environment and community interests.

To deliver on ABM's commitment to stakeholders and the environment, ABM will:

- *comply with legislative and regulatory requirements for the environment*
- *proactively develop and maintain management systems to measure and continually improve environmental performance*

- *operate in a responsible manner to minimise impacts on the environment and prevent pollution*
- *care for the environment and its heritage value*
- *work closely with the community and governing bodies to ensure that a good approach is always followed relating to environmental protection*
- *encourage employees to value the heritage and the environment in which we work*
- *reduce waste, recycle and recognise the by-product of our consumables*
- *maintain an open consultation process with regulators, the community and stakeholders*
- *minimise workplace exposure to hazards, ecosystem disturbance or degradation*
- *re-establish disturbed areas as sustainable ecosystems and community assets*
- *facilitate the training of employees and contractors in relation to their roles and responsibilities to environmental management.*
- *periodically audit ABM's environmental systems and performance to further improve environmental outcomes.*

14.2 Existing environmental management system

14.2.1 Review / audits

A review will be completed every 12 months, or as required, to ensure continuing effectiveness of the EMP and supporting documents to deliver the desired environmental outcomes to address issues and changes in site operation, technology, environmental management procedures, legislation, policies, guidelines and other requirements. The review will involve the environmental manager and other senior management as required. Reviews may include but not limited to:

- results of internal and external audits in respect to compliance with legal and company commitments
- communication from external stakeholders and interested parties
- implementation of the EMP to achieve objectives and targets
- environmental performance
- success of preventive and corrective actions that have been adopted
- findings of previous reviews.

When changes are made to the EMP a new revision of the document will replace the previous version within the company's record systems. Additionally, any updates will be communicated to the Department of Mines and Energy (DME) through the MMP process. If required changes in the EMP will be conveyed to employees and contractors by inductions, toolbox meeting, regular onsite meetings or via email. Regular reviews of the EMP reflect a commitment to deliver continuous improvement in environmental management across the operation. The initial review will incorporate any recommendations and feedback from the EIS process.

14.2.2 Legislative requirements

Commonwealth and Northern Territory legislation relevant to this project are detailed in below:

Commonwealth legislation

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Native Title Act 1993*
- *Aboriginal Land Rights (Northern Territory) Act 1976*

Northern Territory legislation

- *Environmental Assessment Act 1982*
- *Mining Management Act 2001*
- *Mineral Titles Act 2010*
- *Territory Parks and Wildlife Conservation Act 2000*
- *Water Act 2004*
- *Heritage Conservation Act 1991*
- *Aboriginal Land Act 1980*
- *Northern Territory Aboriginal Sacred Sites Act 1989*
- *Planning Act 1999*
- *Work Health and Safety (National Uniform Legislation) Act (and related Regulations)2007*

14.2.3 Responsibilities

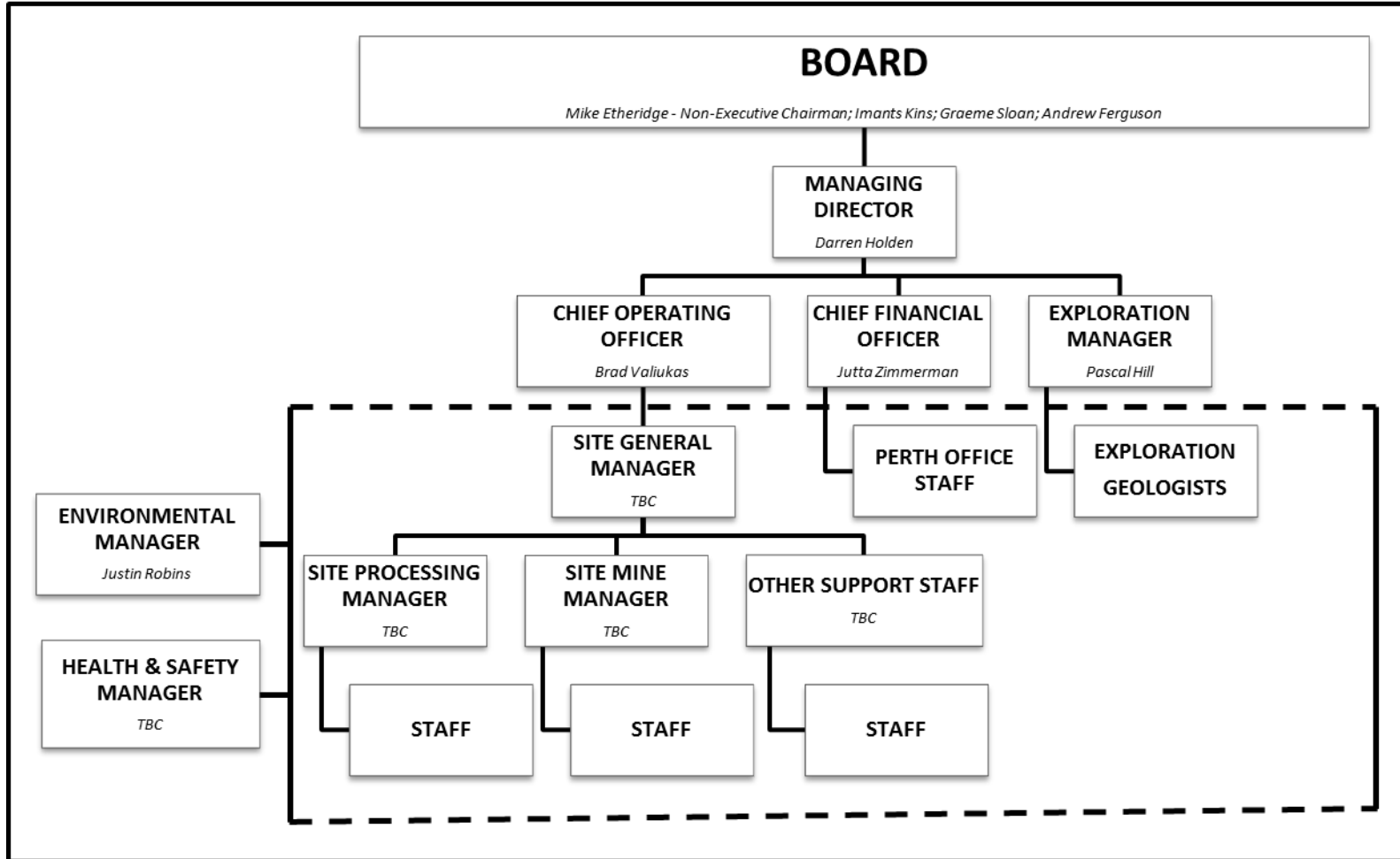


Figure 14-1. ABM organisational chart of management at the Twin Bonanza project

Figure 14-1 details the organisational chart for the Twin Bonanza operation. Review and update of the organisational chart occurs on an as-needs basis to reflect any changes to the management structure. In the event of absences, delegation of authority is to the next upward level as shown on the chart, unless specifically delegated otherwise.

Overall responsibility for environmental management and compliance at the Twin Bonanza Project lies with the environment manager. Implementing, resourcing and maintaining environmental management as documented in this EMP is the responsibility of the environmental manager and delegated onsite personnel. The environmental manager and relevant onsite managers are responsible for defining and communicating relevant environmental responsibilities and accountabilities to employees, consultants and contractors within their area of responsibility during the stages of construction, operation and decommissioning.

It is the responsibility of ABM employees, consultants and contractors to perform any duties that may potentially impact on the environment in accordance to the requirements in this EMP and supporting documents. All persons have a general environmental duty to prevent environmental harm. If environmental harm, or potential to cause environmental harm, is observed personnel must report all incidents to their manager or the environmental manager.

In addition, all employees, consultants and contractors are required to:

- report any environmental incidents that may occur during the performance of their duties
- implement practical ways to manage environmental risks
- assist in corrective actions and system improvements when audit and review results deem necessary.

The allocation of responsibilities for implementation of environmental management tasks is shown in Table 14.1.

Table 14-1. Environmental responsibilities

Responsibility	Personnel
Monitor overall performance	Environmental manager, chief operating officer (COO)
Ensure regulatory compliance (external)	Environmental manager, COO
Ensure the EMP compliance (internal)	Environmental manager and area managers
Update and maintain the EMP	Environmental manager and/or delegate
Ensure continuous improvement	Environmental manager
Develop and maintain environmental management procedures	Environmental manager and/or delegate

Table 14-2. Roles and responsibilities for EMP implementation

Position/role	Responsibility
COO	<ul style="list-style-type: none"> • Ensure all ABM staff are undertaking works in compliance with the final EMP. • Review and monitor environmental performance at regular intervals / meetings / hold points etc.
Environmental manager	<ul style="list-style-type: none"> • Inform all staff of any site specific environmental performance related requirements (i.e. guidelines and procedures). • Inform managers of requirements of this EMP. • Update and finalise EMP for DME approval. • Identify, obtain and hold on site any other licence, permit, certificate or approval needed to undertake work. • Provide guidance and advice to staff with regard to environmental management requirements. • Review and update the EMP every twelve months or as required (if more frequent) e.g. significant changes to activities and management are proposed. • Carry out environmental audits/inspections/monitoring to verify compliance with the EMP. • Require notification of any major environmental incidents and review the management procedures in place to deal with such occurrences. • Inform the site general manager of any complaints the project receives relating to the undertaking of the works and to investigate the complaint. • Ensure all ABM staff are undertaking works in compliance with the final EMP. • In the event of a non-conformance with either the requirements of this EMP, the relevant section managers are to make certain corrective actions are implemented satisfactorily and in an appropriate timeframe. • Monitor non-compliance and review management procedures if a problem persists. • Facilitate the monitoring / reporting of incidents that may impact on the surrounding environment. • In the event that a complaint is shown to be legitimate, undertake appropriate actions to prevent further complaints. • Conduct internal audits (including review of environmental performance)

Position/role	Responsibility
	<p>and report findings to the COO and managing director.</p> <ul style="list-style-type: none"> • Implement and maintain for the duration of mining a management system that includes procedures and forms for the documentation of environmental accidents/incidents, non-conformances and complaints, and procedures for undertaking corrective and/or preventative actions to rectify any accidents/incidents, non-conformance or complaints. • Monitor statutory requirements and ensure compliance.
<p>Site specific managers i.e processing manager, camp manager, site general manager</p>	<ul style="list-style-type: none"> • Induct and train staff and/or contractors so they are able to meet ABM's requirements, the requirements of the EMP and follow the necessary procedures. • Ensure that all staff are aware of and understand their responsibilities and the consequences of their actions under the EMP (including inductions). • Ensure that the EMP is relevant to current requirements and highlights areas of future attention. • Where necessary, coordinate and/or assist in the response to environmental incidents. • Report all incidents with the potential to cause serious environmental harm to the site general manager and environmental manager. • Ensure that all relevant licences/permits/approvals are in place prior to any works that requires them. • Carry out work in accordance with the requirements of the final EMP. • Make all staff and contractors aware of the requirements of the final EMP and any ABM site specific procedures.
<p>Site general manager</p>	<ul style="list-style-type: none"> • Consider and advise on matters specified in the requirements of this plan and comply with such requirements. • Keep a register of all environmental accidents/incidents, non-conformances and complaints. • Provide the environmental manager and COO with a copy of all documented accidents/incidents, non-conformances and complaints. • Ensure the EMP is implemented across the site. • Carry out compliance investigations and report complaint investigation findings to the environmental manager and COO. • Report all non-conformances to the environmental manager and COO in accordance with the set procedure. • Ensure the implementation and effectiveness of corrective actions across site in response to a non-compliance.
<p>Site personnel</p>	<ul style="list-style-type: none"> • Carry out work in accordance with the requirements of the final EMP. • Comply with all permits, approvals and subsequent plans associated with these works. • Comply with all relevant legislation, guidelines and standards.

14.2.4 Objectives, targets and performance indicators

ABM has adopted a number of objectives, with associated targets and performance indicators, to track the success of risk management, mitigation measures and design controls in minimising the environmental impact of the proposal. The EMP adopts a hierarchical order of objectives, targets and performance indicators to ensure that the desired environmental outcomes are measurable.

Measurable environmental objectives and targets are set based on:

- reduction of significant environmental risks
- compliance with legal requirements and commitments
- continual improvement
- available technology
- financial resourcing
- operational and business requirements.

Environmental objectives, targets and performance indicators are communicated to each work area and where relevant, incorporated into work place duties to improve employee awareness, resourcing and timeframes to achieve the desired outcomes.

14.2.5 Competence, training and awareness

All new employees, contractors and visitors to ABM sites or properties are required to undergo an induction that details the environmental issues and requirements relating to the Tanami region.

The induction includes the following items:

1. ABM's environmental policy and commitments
2. relevant legislation and discussion of the consequences of breaching legislative requirements
3. significant fauna of the Tanami region
4. flora and vegetation management
5. erosion control methods and responsibilities
6. storage and handling requirements for chemicals, fuels and other potentially polluting substances
7. waste disposal requirements
8. spill management procedures
9. environmental incident reporting procedures.

Employees and contractors entering reserves or areas of significance will be briefed prior to commencing work to outline other specific environmental issues and special requirements.

The induction includes a briefing on the restriction of vehicles and equipment to cleared tracks and nominated routes.

All environmental inductions will be conducted as part of the site induction. The induction is designed to highlight the:

- importance of complying with environmental requirements
- potential environmental impacts of the operation
- roles and responsibilities
- potential consequences of a divergence from established environmental practices.

Training will be commensurate with the involvement of individual personnel in implementing, reviewing or managing components of the EMP. The daily morning meetings, tool box meetings and in house training will provide opportunities for further task specific environmental training including, but not limited, to weed hygiene, recycling practices and spill management. Content and attendance at morning and toolbox meetings will be recorded to enable a review of the effectiveness of the communication. The site induction will be reviewed on an as needs basis or in the event of a substantial change in environmental procedures to ensure it reflects current working practices.

The respective inline managers aided by the environmental manager or site delegate will ensure that all personnel are suitably qualified or experienced to undertake their work in an environmentally responsible manner. ABM recruitment is targeted to ensure personnel are selected on the basis of skills, experience and job fit. Where a training need is identified by direct managers, arrangements will be made for the appropriate training and development of competences in line with the individual's needs. A record of this training will be stored in site general manager's office.

Individual competency, skills and awareness development is intended to aid:

- compliance with legal requirements and company undertakings to stakeholders
- achieving environmental objectives and targets
- pollution prevention
- continual improvement.

All personnel participate in awareness programs and daily planning meetings; this allows staff to raise issues of concern or interest, and for employees and contractors to be briefed.

14.2.6 Communication

ABM will consult with employees, contractors, and regulatory authorities when changes are made to the Twin Bonanza operation and/or facilities. Examples of situations requiring consultation include, but are not limited to:

- changes to work environments, work methods, work systems, or equipment, which may alter environmental impacts
- changes to factors that are identified in the risk assessment matrix
- undertaking, or reviewing risk assessments and implementing controls
- investigating incidents and complaints.

The environmental manager, managing director, COO and applicable section managers, or delegates will participate in communicating any significant environmental issues.

Environmental objectives include the efficient and effective reporting of incidents including mitigation, documentation and review.

14.2.6.1 Internal communications

Employees and contractors working on the project will be involved (as a minimum) in the communication of environmental issues, and other issues that may impact the environment, through the following methods:

1. daily toolbox and safety meetings
2. regular environmental communications such as toolbox talks, pre-start meetings, daily construction meetings, and work instructions
3. reviews of this management plan
4. risk assessments
5. incident / accident Investigations.

The environmental manager will coordinate and convene regular meetings of the onsite personal. The purpose of these meetings will be to:

1. review and set strategy for implementing the EMP in an efficient and appropriate manner
2. provide a consistent approach to environmental management across the project
3. review evolving works and activities to ensure the current EMP addresses all significant environmental aspects (risks).

The sessions will include discussions and notification of recent environmental incidents, outstanding corrective actions, audit and inspection outcomes, EMP requirement/changes, risks associated with changes, legal and other requirements, and environmental performance against EMPs. Minutes of meetings will be maintained as records.

ABM has implemented the following environmental communication program that will continue for the project:

- environmental management plans are displayed throughout the operation
- standards and guidelines are available electronically.

14.2.6.2 External information and communication

ABM has an incidents and complaints register. All complaints received and incidents reported will be logged within the Incidents and Complaints Register, information contained in the report will include at minimum:

1. Date and time of the complaint or incident.
2. Contact details of the complainant if known, or where no details are provided a note to that effect.
3. The nature of the complaint or incident.
4. The nature of the events that gave rise to the complaint or incident.
5. Prevailing weather conditions and any other factors of note at the time of the complaint or incident.
6. Detail of the actions taken in relation to the complaint or incident including follow-up contact with any complainant.
7. If no action was taken, detail explaining why actions were not warranted.

Incidents that cause or are threatening to cause pollution resulting in material or serious environmental harm will be reported to DME as soon as practicable as per section 19 of the *Mining Management Act 2001*.

External complaints

The environmental manager will be required to report and record any complaints from the public or specific project stakeholders to the site general manager and COO. Complaints received will be entered into a Complaints Register. All external complaints will be investigated by the environmental manager, or delegate 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.

Government departments

ABM will communicate on reportable incidents as part of any reporting requirements under the NT EPA and as part of the annual Mining Management Plan (MMP) pursuant under the *Mining Management Act 2001*.

Central Land Council

As part of ongoing consultation and engagement with the Central Land Council (CLC) information will be provided on any issues or incidents that have been the result of environmental impact. ABM provides feedback to the CLC via annual reporting on activities within the Mt Fredrick No. 2 Aboriginal Land Trust.

14.2.7 EMP elements, aspect and impacts

The following environmental elements, aspects and potential impacts are identified as being of potential significance. Significance is based on assessment of risk in accordance with AS/NZS 4390: Risk Management. Risk is assessed pre and post mitigation with mitigation measures presented in Chapter 5: Risk management. The residual risks (post-mitigation reductions in risk) are primarily the product of reductions in the likelihood of impacts and subsequent consequences. Assessments of the effectiveness of the mitigation measures are based on past implementation of these procedures in the region.

14.2.8 Structure of EMP

The EMP is organised around identified environmental elements, and the activities that may impact each element. Management of elements are structured as sub-plans and are organised as follows.

ENVIRONMENTAL MANAGEMENT PLAN - STRUCTURE	
Objectives	The guiding environmental management objective/s and activities that apply to the element.
Targets	Sets the benchmarks by which the successes of the management strategies are judged.
Actions/ measures/ land management	The procedures to be employed to ensure that the relevant objectives are met.
Performance indicators/ criteria	Sets the performance indicators and criteria for measuring the effectiveness of the actions or measures.
Monitoring	The process of measuring actual performance, or how well the objective has been achieved. This includes the format, timing and responsibility for reporting and auditing of the monitoring results.
Corrective actions	The action/s to be implemented in the case of non-compliance. This includes strategies of remediation and the person(s) responsible for the actions.
Responsibilities	Those responsible for ensuring that the environmental management system is established, implemented and maintained in accordance with the requirements of the EMP.
Response timing	Specified timing for response in the case of non-compliance with the EMP.
Review & reporting	Requirements for review and reporting of the EMP and associated management plans.
Responsible agency	Government and regulatory agencies responsible for compliance.
Relevant legislation and standards	Relevant legislation and standards associated with the environmental aspect discussed in the EMP.

14.3 Construction Environmental Management Plan

The Construction Environmental Management Plan (EMP) documents how ABM will fulfil the company's environmental policy and meet its environmental commitments while the mine is being constructed. ABM recognises that mining often occurs in previously unexplored areas that have undergone limited modification by external forces. A comprehensive EMP has been developed to fulfil the company's environmental management commitments.

AIR QUALITY AND GREENHOUSE GASES MANAGEMENT	
Objectives	To identify and control potential air quality impacts and to minimise the dust impact generated from construction on ABM staff, external stakeholders and the environment.
Targets	<p>No complaints from staff, contractors or the public.</p> <p>No reported OH&S issues caused by dust generated during construction.</p> <p>No evidence of excessive dust arising from construction.</p>
Actions/ measures/ land management	<p>To reduce greenhouse gases staff and contractors will:</p> <ol style="list-style-type: none"> 1. maintain equipment including tyres to maximise efficiency and prevent incomplete combustion of hydrocarbons 2. source and procure machinery with high fuel efficiencies and combustion technologies including catalytic convertors when practicable 3. purchase fuel produces with a low sulfur content if practicable. <p>Staff and contractors will mitigate and manage dust generation through the strategies outlined below.</p> <ol style="list-style-type: none"> 1. A conservative and a progressive approach to vegetation clearances will be followed, ensuring a minimum area is clear at any one time and the majority of the area is still vegetated and undistributed. 2. Topsoil will be removed during periods when soil moisture and wind conditions limit dust generation where practical. 3. Dust generation will be mitigated by regular applications of water by a water cart along haul roads and cleared areas to reduce dust from mine traffic and wind. 4. The use of a dust suppressant will be investigated to reduce the water consumption while maintaining dust suppression. 5. A vegetative cover will be established by progressively ripping and rehabilitating areas no longer required. 6. Vehicle speeds will be limited around site. <p>Additional measures include:</p> <ol style="list-style-type: none"> 1. Rehabilitation as soon as possible to stabilise any areas exposed or disturbed to minimise dust generation. 2. Whenever possible, avoid conducting dust generating activities during high wind speed conditions. 3. Vehicle movements are restricted to cleared access tracks and nominated tracks 4. Maintenance of equipment to minimise air emissions as far as possible, avoid activities generating excessive dust and if required implement dust mitigation measures (i.e. watering and PPE). 5. Undertake regular maintenance of all machinery and vehicles. 6. Direct exhaust emissions from mobile plant away from the ground. 7. Limit vehicle, plant and machinery speeds to reduce dust.
Performance indicators criteria	Dust levels will not exceed the New South Wales Department of Environment and Conservation standards for dust deposition, monitoring and mitigation.

	<p>1. Nuisance dust levels are defined as a total of 4 grams/m²/month, and monitoring is recommended over the space of a month. In addition, an increase of 2 grams/m²/month can be considered a nuisance.</p>
Monitoring	<p>Dust monitoring at the Twin Bonanza mine site and accommodation facilities will comprise dust deposition monitoring points and daily visual monitoring. Deposition dust monitors provide details of dust deposition within a defined time period but cannot be correlated to specific dust events or sources. To be able to monitor dust on a daily basis on site managers will observe current dust conditions. Depending on conditions this will facilitate management measures for example, more frequent water application via a water cart.</p> <p>Complaints received will be recorded and attended to promptly.</p> <p>Records in Environmental Observations and Incident Register.</p>
Corrective actions	<p>The following actions are to be undertaken when an incident or non-conformance is identified:</p> <ul style="list-style-type: none"> • An investigation into the incident or non-conformance is to be immediately undertaken by the site supervisor. • The identified cause/s is/are to be rectified to prevent additional incidents or non-conformance. For example high levels of dust leading to the coating of vegetation. • Review processes, instigate procedural change and feed back into the EMP.
Responsibilities	Environmental manager
Response timing	Immediate response to any emissions threatening staff and environment. Direct reporting of incident to environmental manager.
Review and reporting	<p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>.</p> <p>Review of any observations/incidents in annual MMP reporting.</p>
Responsible agency	<p>Department of Minerals and Energy – section 29 of <i>Mining Management Act</i></p> <p>Department of Health and Families - NT Public Health Act and NT Public Health Regulation</p> <p>Work Place Health and Safety NT</p>
Relevant standards and legislation	<p><i>Work Health and Safety (NUL) Act 2011</i> (NT) under Division 2 Primary Duty of Care</p> <p><i>Waste Management and Pollution Control Act 1998</i> (NT)</p> <p>Leading Practice Sustainable Development (LPSD) - Airborne Contaminants, noise and vibration</p> <p>Leading Practice Sustainable Development (LPSD) - Biodiversity Management</p> <p>International Erosion Control Associations (IECA) Best Practice Erosion and</p>

	<p>Sediment Control Guidelines (BPESC) (Books 1-6).</p> <p>New South Wales Department of Environment and Conservation Standards for Dust Deposition</p>
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The following sections identify the environmental elements potentially impacted during the construction program of the mine site, the potential causes of impacts, the management procedures applicable to protecting the values, and monitoring of environmental conditions following mitigation. These are the practical components of the EMP and are intended to prevent or minimise environmental impacts.

14.3.1 Flora and fauna - biodiversity

The staged approach to the project means that biodiversity management will be the same for construction as it is for operation. Refer to section 14.4.1 - all details are relevant to both construction and operation.

14.3.2 Surface water

Refer to section 14.4.2 - all details will be relevant for both construction and operation.

14.3.3 Groundwater

Refer to section 14.4.3 - all details will be relevant for both construction and operation.

14.3.4 Fire management

Refer to section 14.4.4 - all details will be relevant for both construction and operation.

14.3.5 Air quality and greenhouse gases

Refer to section 14.4.5 - all details will be relevant for both construction and operation.

14.3.6 Noise and vibration

NOISE AND VIBRATION MANAGEMENT	
Objectives	Minimise noise emissions and vibration and mitigate potential impact as far as possible.
Targets	<p>No complaints from staff, contractors or the public.</p> <p>Compliance with legislation and regulatory requirements.</p>

NOISE AND VIBRATION MANAGEMENT	
Actions/ measures/ land management	<p>Strategies to be implemented include:</p> <ul style="list-style-type: none"> • Avoidance if practicable and design activities to minimise noise and vibration. • ABM staff and contractors will ensure 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. • ABM will establish a minimum 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. • Employees will be trained in the appropriate use and application of machinery to minimise noise emissions as far as practicable. • 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.
Performance indicators criteria	Number of noise and vibration complaints.
Monitoring	<p>Monitoring will incorporate:</p> <ul style="list-style-type: none"> • 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. • 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.
Corrective actions	<p>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.</p> <p>All external complaints will be investigated by the environmental manager or health and safety manager and when required actions taken to resolve the matter.</p>
Responsibilities	Health and safety manager

NOISE AND VIBRATION MANAGEMENT	
	<p>Environmental manager</p> <p>This plan will be implemented in the induction for all staff and contractors.</p>
Response timing	<p>Immediate response to any noise emissions and vibration issues threatening staff and environment. Direct reporting of incident to health and safety manager and environmental manager.</p>
Review and reporting	<p>As part of on-going consultation and engagement with the CLC information will be provided on any issues or incidents that have been the result of excessive site noise and vibrations.</p> <p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>, and Work place Health and Safety NT in accordance with <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care</p> <p>Review of any observations/incidents in annual MMP reporting.</p>
Responsible agency	<p>Department of Minerals and Energy – section 29 of <i>Mining Management Act</i></p> <p>Work place Health and Safety NT - <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care</p>
Relevant standards and legislation	<p><i>Work Health and Safety (NUL) Act 2011</i> (NT) under Division 2 Primary Duty of Care</p> <p><i>Waste Management and Pollution Control Act 1998</i> (NT)</p> <p>NOHSC:1007 (2000) - National Standard for Occupational Noise.</p> <p>AS/NZS 1269.3:2005 - Occupational noise management – hearing protector program</p> <p>LPSD - Airborne Contaminants, noise and vibration</p> <p>Code of Practice- Worksafe – Managing and preventing hearing loss at work</p>

14.3.7 Waste management

Waste generated during the construction of the Twin Bonanza project can be divided into mineralised waste (as a by-product of the extraction and processing of the ore that includes tailings and waste rock) and non-mineralised waste (generated through the general operating processes on site).

14.3.7.1 Mineralised

No mineralised waste will be produced prior to production. Refer to section 14.4.7.1 for operational mineralised waste management.

14.3.7.2 Non-mineralised

NON-MINERALISED WASTE MANAGEMENT	
Objectives	Achieve the best possible environmental outcome by minimising waste generation, maximising waste re-use, maximising recycling and safely treating and disposing of non-recyclable materials. To prevent wastes from contaminating the surrounding environment.
Targets	Achieve efficient waste management by: <ul style="list-style-type: none"> • optimising the processes/products that produce zero or minimal waste requiring disposal • not contaminating surrounding environment • maximising the principles of avoid, reduce, reuse and recycle wherever possible • safely disposing of non-reusable and recyclable materials.
Actions/ measures/ land management	Waste management actions will include: <ul style="list-style-type: none"> • segregating wastes that are recyclable and reusable, and will endeavour to recycle wastes in appropriate recycling facilities or use on site if applicable • re-using or recycling wastes such as oil, scrap metal and timber pallets while others will be disposed of on-site • utilising processes/products that produce zero or minimal waste requiring disposal • utilising processes/products which minimise contamination of the surrounding environment • placing contaminated wastes, including materials that have been in contact with lubricants, greases, hydrocarbons and other hazardous chemicals in designated disposal bins for transporting off site and disposal • installing septic tanks and leach and evaporation systems in line with the Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion and Prevention) Regulations – Regulation 28. • recycling saline water rejected from the plant as a by-product of the reverse osmosis and mixing it with the water for the processing plant • storing waste oil in waste oil tanks/containers prior to offsite disposal • re-using decanted water from the tailings dam in the processing plant to reduce water consumption and assist in the consolidation of tailings.
Performance indicators criteria	Appropriate waste management resulting in minimal environmental effects. Effective recycling and reuse of appropriate materials to reduce resource use.
Monitoring	Regular inspections/audits by of camp and operational areas to ensure that waste is being managed appropriately. Records kept of waste disposed to licenced facilities. Monitoring will include the recording of waste types and volumes generated on-site (e.g. general waste, contaminated waste, scrap metal and recyclables) and being transported off-site.
Corrective actions	If an incident occurs including improper waste disposal and failure to recycle waste, investigate incident then instigate procedural change. If deemed

NON-MINERALISED WASTE MANAGEMENT	
	necessary further workforce training.
Responsibilities	Environmental manager Site general manager
Response timing	Immediate response to any waste management incident. If training is required implement over required training timeframe.
Review and reporting	Records will be reviewed on a regular basis and appropriate corrective actions formulated to reduce or eliminate waste generation or impacts associated with waste. Reporting of any incidents internally and to DME in accordance with section 29 of the <i>Mining Management Act</i> . Include summary of inspections/audits and waste management activities (including recycling) in annual MMP update.
Responsible agency	Department of Minerals and Energy – section 29 of <i>Mining Management Act</i> Work place Health and Safety NT - <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i>
Relevant standards and legislation	<i>Waste Management and Pollution Control Act 1998</i> (NT) <i>Waste Management and Pollution Control (Administration) Regulations 2001</i> (NT) <i>Public and Environmental Health Act 2011</i> (NT) <i>Water Supply and Sewerage Services Act 2000</i> (NT) <i>Water Act 2004</i> (NT) <i>Mining Management Act 2009</i> (NT) NT Department of Health - Environmental Health Fact Sheet #700 - Requirements for Mining and Construction Projects Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent (1996) AS 1940-2004: The storage and handling of flammable and combustible liquids Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (2013) AS1940-2004 - The storage and handling of flammable and combustible liquids LPSD - Hazardous Materials Management

14.3.8 Rehabilitation

Although progressive rehabilitation will be undertaken throughout the rest of the project; there will be no rehabilitation undertaken until the project is in full operation.

14.3.9 Community

Community environmental management will be the same as for operational management as all details will be relevant for both construction and operation.

14.3.9.1 Cultural

Refer to section 14.4.9.1.

14.3.9.2 Social

Refer to section 14.4.9.2.

14.3.10 Biting insects

BITING INSECTS MANAGEMENT	
Objectives	Prevent the risk of creating biting insect breeding sites, namely mosquitos, associated with construction activities
Targets	No sites which encourage mosquito breeding
Actions/ measures/ land management	<p>Health and safety:</p> <ul style="list-style-type: none"> • induct all personnel entering the area on the risks of biting insects • ensure camp accommodation is screened to exclude insects • instruct and encourage personnel to follow standard procedures from reducing mosquito bites including wearing long sleeved shirts, long trousers, and use of mosquito repellents • record all instances of insect born disease. <p>Prevent the introduction of biting insects (particularly mosquitos) to the site by:</p> <ul style="list-style-type: none"> • inspecting any ponds and on-site excavations filled with water for the presence of mosquito larvae during the wet season; if larvae are detected suitable method of control implemented • filling or draining any depressions created in the ground surface where possible to prevent the ponding of water and all drainage channels/spoon drains will be kept as shallow as possible to prevent ponding • placing stockpiles in areas that do not impede drainage and will be shaped to prevent ponding • designing ponds, dams and other water holding structures appropriately and maintained to minimise the potential for mosquito breeding • taking care that ponding does not occur in rubbish storage areas

BITING INSECTS MANAGEMENT	
	<ul style="list-style-type: none"> controlling erosion and wash-down practices to prevent sediment and debris forming standing water pools around the site constructing haul roads and the main access road to minimise any potential for constricting flow avoiding pooling of water for mosquito breeding sites.
Performance indicators criteria	<p>No increased larvae or adult mosquito activity present on site</p> <p>PPE adequate to protect against bites</p> <p>Minimal impacts and bites from Mosquitos reported to medical officer on site</p>
Monitoring	<p>ABM staff will periodically check mosquito activity within the accommodation and work areas, including the water storage dams, to identify the success of mitigation measures and to determine whether larval and adult eradication programs should be implemented.</p>
Corrective actions	<p>If mosquitos and larvae are identified at an area that is the result of ABM activities the following steps will be completed.</p> <ul style="list-style-type: none"> ABM will seek advice from the Northern Territory Medical Entomology Branch, before proceeding with chemical eradication of the mosquitos. Habitat modification of existing infrastructure and breeding receptacles to prevent mosquito breeding. The aim of habitat modification is to reduce the surface water ponding onsite to discourage and reduce mosquito breeding.
Responsibilities	<p>Environmental manager</p> <p>Site general manager</p> <p>Various site managers</p>
Response timing	<p>Immediate reporting followed by implementation of management measures. Timeframe for management measures dependent on required action.</p>
Review and reporting	<p>All infestations will be reported to the environmental manager and/or delegate.</p> <p>Any significant infestations of biting insects and/or sickness due to biting insects are to be reported to the Northern Territory Medical Entomology Branch.</p>
Responsible agency	<p>Centre for Disease control - Northern Territory Government.</p> <p>Medical Entomology - Northern Territory Medical Entomology Branch.</p>
Relevant standards and legislation	<p>Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites 2005. NT Government.</p>

14.3.11 Chemicals and dangerous goods

There will be minimal chemicals and dangerous goods onsite during construction other than fuels and hydrocarbons for the vehicles and processing plant. Therefore all management

details of chemicals and dangerous goods are outlined in the Operations Environmental Management Plan in section 14.4.11.

14.3.12 Health and safety

HEALTH AND SAFETY MANAGEMENT	
Objectives	The construction phase does not adversely affect the health and safety of employees, contractors or the general public.
Targets	No reportable injuries and work-related illnesses.
Actions/ measures/ land management	Health and safety training will be incorporated into the area specific inductions and site induction for all staff, contractors and visitors to the site. Job Safety Analysis will be completed for any new task or modification to an existing task. Establishment of a safe work place and/or environment.
Performance indicators criteria	Number of reported incidents Severity of incidents
Monitoring	All incidents or complaints regarding health and safety will be managed in accordance with ABM's health and safety management system. The procedure requires the following actions to be undertaken: <ol style="list-style-type: none"> 1. Take any necessary immediate action 2. Report the incident or complaint 3. Undertake an investigation (if warranted by regulators and/or management plan) 4. Determine root causes 5. Undertake may necessary corrective or preventative actions 6. Monitor action implementation 7. Audit effectiveness of action
Corrective actions	ABM will investigate, respond to and take appropriate corrective action and preventive action following a health and safety incident.
Responsibilities	Health and safety manger
Response timing	Immediate action undertaken as soon as possible within receipt of a complaint and/ or notification of review.
Review and reporting	All incidents and complaints will be recorded in the health and safety incident reporting system. Incident notification sent to NT Worksafe.
Responsible agency	Worksafe NT Department of Minerals and Energy – section 29 of <i>Mining Management Act</i>

HEALTH AND SAFETY MANAGEMENT	
Relevant standards and legislation	<p><i>Work Health and Safety (National Uniform Legislation) Act</i> (and related Regulations)2007 (NT)</p> <p>Work Health and Safety (National Uniform Legislation) Regulations</p>

14.3.13 Incidents and complaints management

INCIDENTS AND COMPLAINTS MANAGEMENT	
Objectives	Manage environmental or social incidents and complaints.
Targets	<p>Immediate action undertaken as soon as possible within receipt of a complaint.</p> <p>Investigations completed within of receipt of a complaint.</p> <p>All corrective actions implemented by the nominated due date.</p>
Actions/ measures/ land management	<p>All incidents or complaints about either environmental or social issues will be managed in accordance with the relevant ABM procedure.</p> <p>The procedure requires the following actions to be undertaken:</p> <ol style="list-style-type: none"> 1. Take any necessary immediate action 2. Report the incident or complaint 3. Undertake an investigation (if warranted by regulators and/or management plan) 4. Determine root causes 5. Undertake may necessary corrective or preventative actions 6. Monitor action implementation 7. Audit effectiveness of action
Performance indicators criteria	<p>Number of complaints received.</p> <p>Number of complaints resolved within specific timeframe.</p> <p>Effective implementation of appropriate management plans.</p>
Monitoring	Monitor performance against the complaints and actions taken.
Corrective actions	<p>If further incidents occur or complaints be received in relation to previous occurrences the following corrective actions will be undertaken (where applicable):</p> <ul style="list-style-type: none"> • additional environmental awareness training of the workforce with respect to the procedures to be followed • investigation into why the incident/complaint was not addressed • implement measures to rectified the ongoing issue.
Responsibilities	Environmental manager

INCIDENTS AND COMPLAINTS MANAGEMENT	
Response timing	Immediate action undertaken as soon as possible within receipt of a complaint and/ or notification of review.
Review and reporting	All incidents and complaints will be recorded in the environmental management incident reporting system. Reports of all incidents and complaints will be submitted to ABM’s managing director and board of directors. The complainant will be advised of what action, if any, is taken as a result of the complaint.
Responsible agency	Department of Minerals and Energy – Section 29 of <i>Mining Management Act</i>
Relevant standards and legislation	Refer to appropriate management plan.

14.4 Operational Environmental Management Plan

The following sections identify the environmental elements potentially impacted during the operational stage of the mine site, the management procedures applicable to protecting the environmental values, and monitoring of environmental conditions following mitigation of impacts. These are the practical components of the EMP and are intended to prevent or minimise environmental impacts.

14.4.1 Flora and fauna - biodiversity

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
Objectives	To minimise risk of impacts to flora and fauna. To minimise risk to threatened species identified.
Targets	No disturbance to native fauna (i.e. injuries or death), especially species of conservation significance outside of the approved footprint. No impact to fauna and flora habitats outside of approved footprint including fragmentation of habitats. No loss of viable topsoil during clearing processes. No vegetation clearing beyond approvals. No introductions of non-native fauna and flora species.
Actions/ measures/ land management	Measures to achieve targets: <ul style="list-style-type: none"> • Relocate mining infrastructure away from bilby and mulgara habitat. • If threatened species are identified within the proposed clearing area,

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
	<p>this will trigger further investigation and a case by case plan as required to minimise potential harm to individuals.</p> <ul style="list-style-type: none"> • All land clearing activities associated with the project will require completion and compliance of ABM’s Land Clearing Procedure. • Vegetation clearing will only occur when required (i.e. no wide scale clearing prior to building waste rock dumps) as clearing prior to immediate development exposes soils to wind and water erosion. • Compulsary inductions detail the presence of threatened species and employee’s duty to comply with ABM’s environmental requirements. • Pest management for the Twin Bonanza project to ensure that predation pressure on threatened species is not increased as a result of the mining operation. • A night speed limit of 60 km/hour will be adopted and posted within areas of known bilby and mulgara activity on haul roads and roads within the project area. • Identified areas of bilby and mulgara activity will be demarcated on maps, with access restricted at these areas. • fire only being used under controlled condition and there will be no intentional starting of bush fires without explicit approval from government authorities and the CLC (refer to Fire Management Plan) • Construction of the tailings dam will not create an uneven floor thus forming islands for migratory and water bird roosting. • During operations supernatant water resting against dam walls will be minimised to prevent additional habitat for waders and drinking access for granivorous birds. • Only a small volume of tailings material will be processed using cyanide. The Acacia Reactor used to process these tailings will have a cyanide removal and neutralisation module that ensures no cyanide is discharged. Tailings characterisation of the gravity separated tailings which is the bulk of tailings has highlighted that it is unlikely to generate acid mine drainage. Discharge and supernatant water will be monitored monthly to detect the potential loading of arsenic and other elements. • Construct and decommission all production and monitoring bores in accordance to the document titled “Minimum Construction Requirements for Water Bores in Australia, Edition 3”. If deeper aquifers are targeted then management measures will ensure cross aquifer contamination does not occur (i.e. sealing of the aquifer by concreting). • Site cleanliness will be maintained at a high level to avoid attracting introduced fauna species by making sure rubbish around the camp;

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
	<p>mining and processing area is managed.</p> <ul style="list-style-type: none"> • Waste from covered bins will be collected regularly and transferred to landfill. • Fences are to be erected around landfill. • Pests will be baited and/or trapped. • Putrescible wastes will be burned. • As far as practicable the effects and availability of man-made water sources on terrestrial fauna will be reduced (namely one-humped camels, dingoes, cats). • Machinery and equipment arriving at site will be inspected for signs of stowaway pests. • Trapping and/or hunting will be implemented across the project area for feral predators that have the potential to adversely affect threatened species (namely greater bilby and brush-tailed mulgara which are known to persist at Twin Bonanza). • To dissuade dingoes and other scavengers from entering camps, food scraps are to be burnt, standing water is to be avoided and feeding and any other interaction with fauna is not permitted.
Performance indicators/ criteria	<p>No greater bilby deaths as a result of mining activities.</p> <p>No significant decline in the quantity and quality of greater bilby habitat adjacent to mining operations.</p> <p>No brush-tailed mulgara deaths as a result of mining activities.</p> <p>No significant decline in the quantity and quality of brush-tailed mulgara habitat adjacent to mining operations.</p> <p>Clearing within approved boundaries</p> <p>Fully recovery of topsoil.</p> <p>Rate of tree mortality in palaeochannels is comparable to the surrounding environment.</p> <p>No new pest species introduced to the site.</p> <p>No increase in the existing populations of known pest species.</p> <p>No new weed species introduced to the site.</p> <p>No increase in the existing populations of known weed species.</p>

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
Monitoring	<p>Monitoring will include:</p> <ul style="list-style-type: none"> • Regular inspections of work sites, tracks and camp areas. • Sand plot monitoring which will be used to estimate activity and population of greater bilby, mulgara and predators within the Twin Bonanza project area. This monitoring program will be based on methods developed by Colleen O'Malley and Rachel Paltridge (Pavey 2006a). • A vegetation monitoring program including weeds will occur within the project area. The objective of this program is to monitor vegetation condition across the site, and the program can be used to identify potential degradation of threatened species habitat. • A vegetation monitoring program is proposed to occur within the project area. The objective of this program is to monitor vegetation condition across the site, and can be used to identify potential degradation of brush-tailed mulgara habitat (which may or may not be attributed towards mining operations). • Weekly site inspections of land fill and camp area for pest fauna (such as feral cats and dingoes). • As part of regular monitoring of the tailings dams and sewerage dam, the presence of water bird/migratory species and evidence of illness or fatalities will be recorded. <p>The palaeochannel monitoring program is to provide possible warning signs that water extraction operations are having an adverse impact on deep rooted trees within the palaeochannel environment. Monitoring includes:</p> <ul style="list-style-type: none"> • Visual tree health assessment, which aims to determine a health score for each tree based on visual parameters. • Monitoring of standing water level, which measures standing water levels from purpose built monitoring bores.
Corrective actions	<p>Any failures to comply will be investigated, with appropriate actions taken to overcome the non-compliance. Actions may include:</p> <ul style="list-style-type: none"> • In the event of encountering a site of apparently major flora or fauna significance the area will be avoided or work ceased. • Any new weed or feral animal species occurrence shall be recorded by the employee and reported to the site manager, DME & Department Lands, Planning and Environment; as applicable. An eradication program will then be implemented. • If monitoring provides conclusive evidence that greater bilby and

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
	<p>mulgara habitat is in decline because of ABM's activities, ABM will investigate and liaise with experts in the field to determine the best management measures to resolve the issue. ABM will take preventative measures if the cause of decline can be determined.</p> <ul style="list-style-type: none"> • Any unauthorised clearing will be reported to DME and propose re-vegetation strategy for the affected area. • An injury or death of a greater bilby and mulgara as a result of mining activities (i.e. vegetation clearing, haul trucks traffic, and light vehicle traffic) would be immediately reported to DME and DOE. This would trigger a response that reviews reasons why the incident occurred and how the risk of re-occurrence could be minimised. • If cats are detected during weekly site inspections of camp area and landfill site, this will trigger a control program using baits within the landfill compound that does not provide access to native species • If large bird aggregations are occurring at tailings dams then bird deterrent activities, such as use of bird scarers, can be introduced. • An appropriate method of weed treatment, either chemical or mechanical, will be used for each identified weed species.
Responsibilities	<p>Environmental manager Site general manager</p>
Response timing	<p>Report incidents as soon as possible. Time taken for remedial actions depend on action to be taken.</p>
Review and reporting	<p>Include details in an updated MMP as required.</p> <p>Annual audits of biodiversity management compliance will be conducted and reported as part of the annual MMP review and renewal process. ABM operations will be annually audited against this the Biodiversity Management Plan and the results provided to regulatory authorities, such as the DME, as requested.</p> <p>Incident reporting will be implemented to record any safety or environmental non-conformances or incidents.</p> <p>Any recording of a Declared Weed, Class A, B, C within EL28322 will be reported to the DLRM – Weeds Branch as soon as practicable following recording.</p>
Responsible agency	<p>Department of Minerals and Energy – Section 29 of <i>Mining Management Act</i> Department of Land Resource Management - NT Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i> Department of Environment (Commonwealth)</p>
Relevant legislation and standards	<p><i>Environment Protection and Biodiversity Act 1999</i> (Cth) <i>Territory Parks and Wildlife Conservation Act 2006</i> (NT) <i>Water Act 1992</i> (NT)</p>

FLORA & FAUNA / BIODIVERSITY MANAGEMENT	
	<p><i>Waste Management and Pollution Control Act 1998</i> (NT)</p> <p><i>Dangerous Goods Act 1998</i> (NT)</p> <p><i>Weed Management Act 2001</i> (NT)</p> <p>Revised National Weeds Strategy 1999</p> <p><i>Bushfire Act 2009</i> (NT)</p> <p>Bushfire Regulations 2005;</p> <p><i>Environmental Assessment Act 1982</i> (Cth)</p> <p><i>Fire and Emergency Act 2012</i> (NT)</p> <p>Fire and Emergency Regulations 2011</p> <p><i>Work Health and Safety (NUL) Act 2011</i> (NT)</p> <p>National Recovery Plan for the Greater Bilby <i>Macrotis lagotis</i> (Pavey 2006)</p> <p>Best Practice Environmental management in Mining: Cyanide Management (Environment Australia 1998)</p> <p>Northern Territory Land Clearing Guidelines (Department of Natural Resources, Environment, the Arts and Sport. 2010. Land Clearing Guidelines. Technical Report 20/2009D, NT Government, Darwin</p> <p>Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping. Technical Report No. 02/2007D, NT Government, Darwin</p> <p>Supplement to the NT Parks and Wildlife Conservation Master plan for bioregional conservation significance</p> <p>DLRM threatened species fact sheets</p> <p>Commonwealth's guidelines for the assessment of the significance of impacts on matters of national environmental significance</p> <p>LPSD - Biodiversity Management</p> <p>International Erosion Control Associations (IECA) Best Practice Erosion and Sediment Control Guidelines (BPESC) (Books 1-6)</p> <p>LPSD - Water Management</p> <p>Fauna Egress Matting and Ramps - Western Australia Department of Mines and Petroleum</p> <p>Northern Territory Government (2010) Guidelines for Weed Data Collection in the Northern Territory, Northern Territory Government of Australia.</p> <p>Guideline for the General Management of Hazardous Waste in the NT</p> <p>Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites In the Northern Territory - NTEPA January 2013</p>

14.4.2 Surface water

SURFACE WATER MANAGEMENT	
Objectives	To minimise risk of impacts to surface water resources. To maximise the efficient use of water on site.
Targets	<p>Minimise amount of sediment runoff</p> <p>Management including storage and handling of hazardous material and hydrocarbons aligned with Australian Standards.</p> <p>Minimise the blocking of ephemeral water courses.</p> <p>Management of tailings dam in line with operating strategy.</p> <p>Water quality not above trigger values.</p>
Actions/ measures/ land management	<p>Action and measures to be taken include:</p> <ul style="list-style-type: none"> • Some potential for flooding was identified along the lower lying areas of the main access road, and within the adjacent borefield area. The main access road is already established, and has been fitted with low pass crossings in areas with a high likelihood of seasonal flooding. The flood potential within the borefield area has not been assessed in detail, as there will be little infrastructure installed in this area. It is anticipated that any equipment installed within the borefield area should be able to cope with seasonal flooding. • All surface water storage facilities will be designed, constructed, and managed to prevent any release of water into the surrounding environment, regardless of the actual level of contamination present. The Water Storage Dam has been constructed using an HDPE liner. This will prevent all seepage from these facilities. Water will primarily be removed by pumping and recycling water into to the processing circuit and by evaporation (up to approximately 3,000 mm/yr) • Diversion drains and bunds will be used to redirect any “clean” surface water flows around the main site areas. • Exposed soil surfaces will be engineered to minimise erosion potential. This will be achieved through careful material selection, slope grading, and other surface treatments. • Any sediment-laden water within the disturbance areas will be captured and treated in sediment basins to minimise the amount of sediment released into the surrounding environment. • Hydrocarbons and other chemicals (e.g. ammonium nitrate) will be stored onsite, primarily in the workshop, processing plant, and explosive magazines. All tanks, fuel drums and chemical products shall be stored within self bunded tanks, bunded/lined areas or within portable self bunded pallets. Permanent bunded storage areas are to be located away from the accommodation site and drainage lines. • An Emergency Response Management Plan has been developed to

SURFACE WATER MANAGEMENT	
	<p>outline more detailed procedures for spills that occur outside of the main risk areas outlined here.</p> <ul style="list-style-type: none"> • Waste dumps will be positioned according to surface water modelling result to prevent inhibition of surface water flows. • Tailings and process water dams have been designed for minimal seepage (i.e. non-toxic seepage) or overflow (i.e. high level of contingency above operating levels). Appropriate design, construction and operation of facilities will ensure structural integrity is maintained; in accordance to the principals of the ANCOLD Guidelines. Regular independent inspections will be undertaken to ensure quality control during dam construction. The freeboard of the facility will be managed to ensure that the facility not to be used for water storage, so that water ponding is prevented. • The deposition of tailings and freeboard in tailings dam will be monitored to ensure available capacity and prevent subsequent overtopping in accordance to ANCOLD Guidelines. • The design of outer batters of waste dumps have been based on results from erodibility testing and physical characteristics of the material. • AMD and water leach tests will be undertaken, and design of the waste dump based on the chemical nature of the material. • Waste dumps will be positioned according to the surface water modelling results to reduce inhibition of surface water flows. • Design and operation of the sewerage facility will be accordance with the code of practice for small onsite sewage and sullage treatment systems and the disposal or reuse of sewage effluent - NT Department of Health and Families. Water from ablutions will be sent from approved septic tanks to leach system. • Appropriate clearing methods to minimise potential risk of erosion and sedimentation of downstream surface waters.
Performance indicators/ criteria	<p>Compliance with relevant management plans and design parameters.</p> <p>Specific trigger values and monitoring solutions for surface water and groundwater have been developed according to the ANZECC & ARMCANZ Procedural Framework for the monitoring and assessment of water quality (ANZECC and ARMCANZ, 2000), and these are discussed further in the following sections.</p> <p>The concept of trigger values does not readily apply to the majority of the monitored surface water within the Twin Bonanza project due to the nature of the water that will be present in the tailings dam, water storage dam, and CRD (i.e. this water is likely to have elevated concentrations of arsenic). These facilities have been designed to be fully contained, and no releases of surface water to the environment are planned or expected. Thus, setting specific threshold values for particular constituents is not warranted. Monitoring of these facilities is instead conducted with the purpose of identifying the relevant properties of the water for use within the processing circuit, and so that constituents of particular concern can be identified in the highly unlikely case of</p>

SURFACE WATER MANAGEMENT	
	<p>unexpected releases to the environment.</p> <p>Specific trigger values can, however, be set for the sediment basins. As these facilities have been designed to remove 90 % of material ≥ 0.045 mm in diameter, measurements of sediment basin inflow and outflow will demonstrate this level of removal efficiency, when averaged over 12 rainfall events each year.</p> <p>The current <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZECC and ARMCANZ, 2000) do not provide any guidance for acceptable levels of oil/grease or petroleum hydrocarbons in surface water. Therefore, an alternative two-tiered trigger value system is proposed for monitoring total petroleum hydrocarbons (TPH) in the sediment basins):</p> <ol style="list-style-type: none"> 1. If concentrations of TPH > 15 mg/L are detected, the efficiency of the oil/grease traps is to be assessed, and improvements made, where necessary. 2. If concentrations of TPH > 30 mg/L are detected, the oil/grease traps are considered not to be functioning properly, and improvements to their functioning will be made.
Monitoring	<p>In general, most monitoring activities will be conducted monthly, by following the relevant Standard Operating Procedure (SOP). Monitoring results will be compared against trigger values to determine if any contingency measures are necessary.</p> <p>In the case of surface water from natural rainfall monitoring will occur during rain events when discernible surface water is present.</p>
Corrective actions	<p>Serious spills require cessation of all works at the site, and containment of pollution. Non-compliance requires investigation by the site manager and reporting to environmental manager, and DME if applicable.</p> <p>Exceedance of trigger values for sediment removal in the sediment basins will initiate a review of the sediment basin design, including the input assumptions used (e.g. catchment areas, surface materials, and erosion rates may be different than originally assumed). Modifications to the design of the basins will be made, where the design is found to be inappropriate.</p> <p>A two-tiered trigger value system is proposed for monitoring total petroleum hydrocarbons (TPH) in the sediment basins:</p> <ol style="list-style-type: none"> 1. If concentrations of TPH > 15 mg/L are detected, the efficiency of the oil/grease traps is to be assessed, and improvements made, where necessary. 2. If concentrations of TPH > 30 mg/L are detected, the oil/grease traps are considered not to be functioning properly, and improvements to their functioning will be made.

SURFACE WATER MANAGEMENT	
Responsibilities	<p>Environmental manager</p> <p>Site general manager</p>
Response timing	<p>Serious spills require cessation of all works at the site, and containment of pollution.</p> <p>All other issues require immediate action to be undertaken as soon as possible within receipt of a complaint, trigger values exceeded and/ or notification of review.</p>
Review and reporting	<p>Water Quality will be reported annually in the MMP in accordance with the <i>Mining Management Act 2001</i>.</p> <p>Report any significant issues as an incident to DME, in accordance with Section 29 of the Mining Management Act.</p>
Responsible agency	<p>Department of Minerals and Energy</p> <p>Water Resources Division of the Department of Land Resource Management - <i>Water Act 2011</i></p> <p>Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i></p>
Relevant legislation and standards	<p><i>Water Act, 2011</i> (NT)</p> <p><i>Minerals Titles Act 2012</i> (NT)</p> <p><i>Northern Territory Aboriginal Sacred Sites Act</i> (NT)</p> <p><i>Mining Management Act 2001</i> (NT)</p> <p><i>Environmental Assessment Act 1982</i> (NT)</p> <p><i>Waste Management and Pollution Control Act 1988</i> (NT)</p> <p>International Erosion Control Associations (IECA) Best Practice Erosion and Sediment Control Guidelines (BPESC) (Books 1-6)</p> <p>AS1940-2004 - The storage and handling of flammable and combustible liquids</p> <p>LPSD - Hazard Materials Management</p> <p>LPSD - Water Management</p> <p>LPSD - Managing Acid and Metalliferous Drainage 2007</p> <p>GARD Guide - best practices and technology to address AMD issues</p> <p>Mine Wastes. Characterisation, Treatment and Environmental Impacts (Lottermoser, B., 2007)</p> <p>Code of practice for small onsite sewage and sullage treatment systems and the disposal or reuse of sewage effluent - NT Department of Health and Families</p> <p>NT Department of Health - Environmental Health Fact Sheet #700 -</p>

SURFACE WATER MANAGEMENT	
	<p>Requirements for Mining and Construction Projects</p> <p>Waste Management and Pollution Control (Administration) Regulations. NT GOVT</p> <p>LPSD - Water Management</p>

14.4.3 Groundwater

GROUNDWATER MANAGEMENT	
Objectives	<p>To minimise risk of impacts to groundwater resources.</p> <p>To minimise adverse effects to groundwater through extraction.</p>
Targets	<ul style="list-style-type: none"> • No unacceptable impact due to groundwater drawdown. • Management including storage and handling of hazardous material and hydrocarbons aligned with Australian Standards. • Tailings dam design, construction and operation in line with Australian Standards and management of seepage at acceptable levels. • No un-controlled waste disposal and liberation of waste water.
Actions/ measures/ land management	<ul style="list-style-type: none"> • Monitoring bores will be placed at a distance of 10 and 100 m upstream and downstream of the test bore. • Groundwater extraction rates will be managed so that a sustainable yield is maintained, and so that the extraction will not negatively affect other groundwater users. • During the active mine phase, groundwater extraction rates will be managed primarily by measuring flow rates (and volumes) from the production bores and monitoring drawdown within the pumped aquifer(s). • The potential for Acid and Metaliferous Drainage (AMD) from the WRD has been previously assessed, and is considered to be negligible, as the majority of material to be extracted from the pits has been classified as Non-Acid-Forming. • The open pit walls are expected to contain minor veins of partially oxidized sulphides. The presence of small quantities of sulphides is unlikely to have an effect on water quality as the mine pit is not likely to intersect the groundwater (> 100 m bgl). • Use temporary bunded pallets for small hydrocarbon containers. Concrete bunds and double skinned tanks for bulk storage. Appropriate storage and handling of hazardous materials and monitoring of storage facilities in accordance with Australian Standards. • Tailings and process water dams have been designed for minimal seepage (i.e. non-toxic seepage) or overflow (i.e. high level of contingency above operating levels). Appropriate design, construction and operation of facility to ensure structural integrity is maintained; in accordance to the principals of the ANCOLD Guidelines. • Minimise water use in processing plant by recycling of water from

GROUNDWATER MANAGEMENT	
	<p>process water dam.</p>
<p>Performance indicators/ criteria</p>	<p>Trigger levels for water quality are set to protect the natural hydrogeological and biological environment against undue stress, and to protect water quality for potential future uses. In general, the level of protection proposed for the TGBP is intended to maintain a similar level of water quality as was present in the pre-mine environment, and accounting for natural fluctuations in constituent concentrations.</p> <p>In order to determine if site activities are affecting the groundwater quality, the pre-disturbance, or “background”, groundwater quality must first be known. It is anticipated that the first 6-12 months’ worth of data collected from the “monitoring” and “analogue” bores will initially be used to set background levels, and this will be analysed and updated according to the <i>Australian Guidelines for Water Quality Monitoring and Reporting</i> (ARMCANZ, 2000) to develop a 24 month running average as further data is collected in subsequent sampling events. During site operation, the “analogue” bores will be used to track natural fluctuations in the background levels in both the bedrock and palaeochannel aquifer systems (i.e. a BACI analysis).</p> <p>Adherence to groundwater management plan.</p> <p>Water storage facilities are constructed to design specifications.</p> <p>Fuel storage and waste water management systems designed to specifications.</p>
<p>Monitoring</p>	<p>In general, most monitoring activities will be conducted monthly, by following the relevant Standard Operating Procedure (SOP). Monitoring results will be compared against trigger values to determine if any contingency measures are necessary.</p> <p>Groundwater monitoring sites have been selected according to the <i>Australian Guidelines for Water Quality Monitoring and Reporting</i> (ARMCANZ, 2000) so that representative samples of the un-impacted (native or control) and potentially impacted groundwater may be collected both in the pre-mine period and throughout the life of mine.</p> <p>In addition to the chemical analysis, groundwater elevations and extraction rates will also be monitored. Depth to groundwater will be recorded at all “analogue”, and “monitoring” bores, with water depth also being recorded in the “production” bores where practicable. All “production” bores will be fitted with a flow metering device capable of continuous recording of the extracted flow rate and volume.</p>

GROUNDWATER MANAGEMENT	
Corrective actions	<p>Serious spills require cessation of all works at the site, and containment of pollution. Non-compliance requires investigation by the site manager and reporting to the environmental manager, and DME if applicable.</p> <p>If background groundwater water quality levels are exceeded for three consecutive monitoring periods, an investigation of the likely causes (i.e. potential contaminant sources), and an assessment of the likely significance of this in terms of future water uses will be conducted.</p>
Responsibilities	<p>Environmental manager</p> <p>Site general manager</p>
Response timing	<p>Serious spills require cessation of all works at the site, and containment of pollution.</p> <p>Impact on paleochannel vegetation require immediate investigation, and review of water extraction rates.</p> <p>All other issues require immediate action to be undertaken as soon as possible within receipt of a complaint, trigger values exceeded and/ or notification of review.</p>
Review and reporting	<p>Water Quality will be reported annually in the MMP in accordance with the <i>Mining Management Act 2001</i>.</p> <p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>.</p>
Responsible agency	<p>Department of Minerals and Energy – section 29 of <i>Mining Management Act</i></p> <p>Department of Health and Families - NT Public Health Act and NT Public Health Regulation</p> <p>Water Resources Division of the Department of Land Resource Management - <i>Water Act 2011</i></p> <p>Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i></p>
Relevant legislation and standards	<p><i>Water Act 2011</i></p> <p><i>Minerals Titles Act 2012 (NT)</i></p> <p><i>Northern Territory Aboriginal Sacred Sites Act (NT)</i></p> <p><i>Mining Management Act 2001 (NT)</i></p> <p><i>Environmental Assessment Act 1982 (NT)</i></p> <p><i>Waste Management and Pollution Control Act 1998 (NT)</i></p>

GROUNDWATER MANAGEMENT	
	<p>AS1940-2004 - The storage and handling of flammable and combustible liquids</p> <p>LPSD - Hazard Materials Management</p> <p>LPSD - Water Management</p> <p>LPSD - Managing Acid and Metalliferous Drainage 2007</p> <p>GARD Guide - best practices and technology to address AMD issues</p> <p>Mine Wastes. Characterisation, Treatment and Environmental Impacts (Lottermoser, B., 2007)</p> <p>Code of practice for small onsite sewage and sullage treatment systems and the disposal or reuse of sewage effluent - NT Department of Health and Families</p> <p>NT Department of Health - Environmental Health Fact Sheet #700 - Requirements for Mining and Construction Projects</p> <p>Waste Management and Pollution Control (Administration) Regulations. NT Government</p> <p>LPSD - Water Management</p> <p>Minimum Construction Requirements for Water Bores in Australia 2012 (3rd Edition) 1 (National Uniform Drillers Licensing Committee, 2011)</p>

14.4.4 Fire Management

FIRE MANAGEMENT	
Objectives	<p>Minimise the potential of uncontrolled fires associated with mining activities. Ensure that fire control practices are implemented on site to minimise the risk of fire from site operations and bush fires.</p> <p>Ensure that ABM complies fully with its legal obligations in relation to fire safety</p>
Targets	<p>No wildfires caused by mining activities, whether deliberate or accidental.</p> <p>No Improper practices leading to unsuitable fire regimes.</p> <p>No human injuries or loss of equipment/facilities from bushfires.</p>
Actions/ measures/ land management	<ul style="list-style-type: none"> • Around the site fire breaks will be used to prevent naturally occurring fires from damaging buildings and infrastructure. • All mining equipment and gensets will be equipped with appropriate fire extinguishers. • Housekeeping will play a major part in ABM's Fire Management Plan (FMP), including reducing waste and dry vegetation, not only in fire breaks but also around infrastructure on site. • ABM personnel are strictly banned from lighting fires except under controlled conditions. • Prescribed burning has been recommended by the CLC to maintain a reduced-fuel buffer for standard fire protection. This will be adopted for future MMP's and will be utilised where practicable, especially in between fire breaks and infrastructure.

FIRE MANAGEMENT	
	<ul style="list-style-type: none"> • The site induction, which covers environmental and safety aspects, will inform all personnel about fire awareness, the requirement to obtain a Hot Work Permit before undertaking welding, cutting or grinding activities, emergency contact numbers, and procedures in case of a fire. • The site general manager will nominate an onsite person to closely monitor weather conditions, including dominant wind direction, seasonal vegetation growth (fire fuel stores), seasonal rainfall and regional bushfires. Daily monitoring will be necessary from August through to November and observations of fuel loads and rainfall will be required regularly (monthly) throughout the year, fire risk will be higher in years following seasons of good rains. • Monitoring of the BOM website will be undertaken in the evenings, by an appointed staff member, for bushfires warnings and fire bans for the following day. Appropriate management will be implemented the next day. • Strategic fire breaks will be constructed around all buildings and operating plant. Firebreaks will aim to enable vehicle access to fight fires (approximately 6m wide), will stop a fire under mild conditions, and are essential as control lines from which back burning may be undertaken to stop wildfires in extreme conditions. Back burning and/or controlled burning will only be undertaken with a permit under the Bushfire Act that is currently administered by Bushfires NT (where applicable) and in consultation with the Traditional Owners. • ABM will conduct prescribed reduced-fuel burning along fire breaks as a standard feature of fire prevention and to create a reduced fuel buffer of 50m around the facilities. This will aid in the control of fires approaching the mine site. The location and timing of prescribed burning will be negotiated with traditional owners in order to minimise risks to any assets in the surrounding area, such as sacred sites. • Hydrocarbons and hazardous materials are to be stored in accordance with AS1940-2004 - The storage and handling of flammable and combustible liquids; appropriate hazard separation zones of fire risk areas from fuel storage and hazardous chemical storage facilities will be enforced. • Personnel are to comply with Hot Work Permits when conducting welding, cutting and grinding activities onsite. The permit will specify fire control practices to ensure no fires are started from conducting these activities. • ABM will incinerate solid wastes, i.e. cardboard and food scraps, to reduce the solid and putrescible wastes around camp. ABM will incinerate material in a bunded pit, or a turbo burner, only on days where wind is low and the fire risk is low to moderate. • The person nominated to monitor bushfires will be given site specific training to carry out the monitoring role. In addition the mine site is likely to appoint an emergency service officer (ESO) who will assist the paramedic and have specific training in firefighting and emergency

FIRE MANAGEMENT	
	<p>response.</p> <ul style="list-style-type: none"> • Fire wardens will be nominated by the site general manager or delegate and will be trained to respond to serious incidents and fires. Emergency response will be undertaken in accordance with ABM's Emergency Response Management Plan
Performance indicators/ criteria	<p>No fires will intentional or unintentional will affect the environment surrounding the mine site.</p> <p>No injuries, fatalities or loss of infrastructure will occur as a result of a fire.</p>
Monitoring	<p>Hot work Permits are applied for and adhered to.</p> <p>FMP adhered to.</p> <p>Records in Environmental Observations and Incident Register.</p>
Corrective actions	<p>If a fire is a result of ABM activities, investigate then instigate procedural change. If deemed necessary further workforce training.</p> <p>Review processes and feed back into the FMP.</p>
Responsibilities	<p>Site general manager</p> <p>Health and safety manager</p> <p>Environmental manager</p>
Response timing	<p>Immediate response to any fire threatening staff, environment and/or infrastructure. Investigation and corrective action time frame dependent on type of fire management non-compliance.</p>
Review and reporting	<p>The FMP will be subject to ongoing review and change to ensure that it remains relevant and effective throughout the life of the operation.</p> <p>Reporting of any incidents internally and to DME in accordance with section 29 of the <i>Mining Management Act</i>.</p> <p>The company representative is to report major fires to and consult with the NT Bushfires Council, DME and local communities as appropriate.</p> <p>Review of inspections/checks to be provided in annual MMP reporting.</p>
Responsible agency	<p>NT Bushfires Council</p> <p>Department of Minerals and Energy</p>
Relevant legislation and standards	<p><i>Bushfire Act 2009</i> (NT)</p> <p>Bushfire Regulations 2005 (NT)</p> <p><i>Environmental Assessment Act 1982</i> (NT)</p> <p><i>Fire and Emergency Act 2012</i> (NT)</p> <p>Fire and Emergency Regulations 2011 (NT)</p> <p><i>Work Health and Safety (NUL) Act 2011</i> (NT)</p> <p>AS1940-2004 - The storage and handling of flammable and combustible liquids</p>

FIRE MANAGEMENT	
	<p>LPSD - Hazard Materials Management</p> <p>AS 4665-2002, Guidelines for Fire Safety Audits for Buildings (Int)</p> <p>AS 3745-2002, Emergency Control Organisation and Procedures for Buildings, Structures and Workplaces</p> <p>Fire Engineering Guidelines 2001</p>

14.4.5 Air quality and greenhouse gases

AIR QUALITY AND GREENHOUSE GASES MANAGEMENT	
Objectives	To identify and control potential air quality impacts and to minimise the dust impact generated from operations on ABM staff, external stakeholders and the environment.
Targets	<p>No complaints from staff, contractors or the public.</p> <p>No reported OH&S issues caused by dust generated during operations</p> <p>No evidence of significant erosion resulting from operational activities</p>
Actions/ measures/ land management	<p>Ongoing monitoring of air quality in respect to dust.</p> <p>To reduce greenhouse gases staff and contractors will:</p> <ul style="list-style-type: none"> • maintain equipment including tyres to maximise efficiency and prevent incomplete combustion of hydrocarbons • source and procure machinery with high fuel efficiencies and combustion technologies including catalytic convertors when practicable • investigate alternative energy sources (i.e. solar power) where applicable • purchase fuel produces with a low sulfur content if practicable. <p>Odour will be mitigated by:</p> <ul style="list-style-type: none"> • managing chemicals and hydrocarbons appropriately under the standard AS1940-2004 - The storage and handling of flammable and combustible liquids • containing putrescible waste and disposing of it in accordance to on site waste management procedures that includes incineration and/or disposal in a landfill • treating sewage via onsite septic and waste water disposal systems • ensuring the concentrate leach system is closed to prevent the release of cyanide gases into the environment. <p>Mitigate and manage dust generation through the strategies outlined below.</p> <ul style="list-style-type: none"> • A conservative and a progressive approach to vegetation clearances will be followed, ensuring a minimum area is clear at any one time and the majority of the area is still vegetated and undistributed. • Topsoil will be removed during periods when soil moisture and wind

AIR QUALITY AND GREENHOUSE GASES MANAGEMENT	
	<p>conditions limit dust generation where practical.</p> <ul style="list-style-type: none"> • Dust generation will be mitigated by regular applications of water by a water cart along haul roads and cleared areas to reduce dust from mine traffic and wind. • The use of a dust suppressant will be investigated to reduce the water consumption while maintaining dust suppression. • Dust from blasting will be managed by blasting personnel to ensure fine material produced by drilling is used to stem blast holes and adequate stemming will be used at all times. • A vegetative cover will be established by progressively ripping and rehabilitating areas no longer required. • Vehicle speeds will be limited around site. <p>Additional measures include:</p> <ul style="list-style-type: none"> • Rehabilitation as soon as possible to stabilise any areas exposed or disturbed to minimise dust generation. • Whenever possible, avoid conducting dust generating activities during high wind speed conditions. • Vehicle movements are restricted to cleared access tracks and nominated tracks. • Maintenance of equipment to minimise air emissions as far as possible, avoid activities generating excessive dust and if required implement dust mitigation measures (i.e. watering and PPE). • Undertake regular maintenance of all machinery and vehicles. • Direct exhaust emissions from mobile plant away from the ground. • Limit vehicle, plant and machinery speeds to reduce dust. • In accordance to the EMP monitoring and inspections and if required suppression techniques to be employed (i.e. water spray). • Avoidance if practicable and design activities to minimise vibration and dust.
Performance indicators/ criteria	<p>Dust levels will not exceed the New South Wales Department of Environment and Conservation’s standards for dust deposition for dust monitoring and mitigation.</p> <p>Nuisance dust levels are defined as a total of 4 grams/m²/month, and monitoring is recommended over the space of a month. Also an increase of 2 grams/m²/month can be considered a nuisance.</p>
Monitoring	<p>Dust monitoring at the Twin Bonanza mine site and accommodation facilities will comprise dust deposition monitoring points and daily visual monitoring.</p> <p>Deposition dust monitors provide details of dust deposition within a defined time period but cannot be correlated to specific dust events or sources. Managers within the process, accommodation and mining area, will monitor current dust conditions on a daily basis. Depending on conditions this will facilitate management measures for example, more frequent water application via a water cart.</p>

AIR QUALITY AND GREENHOUSE GASES MANAGEMENT	
	<p>The dust collected in the gauges will in accordance to standard AS/NZS 3580 tested for insoluble solids and ash content. The results of the monitoring program will be used to provide an indication of the effectiveness of the dust control measures being implemented at the mine site. Where the dust limit is exceeded targeted dust management actions are to be implemented.</p> <p>Complaints received will be recorded and attended to promptly.</p> <p>Records in Environmental Observations and Incident Register.</p>
Corrective actions	<p>The following actions are to be undertaken when an incident or non-conformance is identified:</p> <ul style="list-style-type: none"> • an investigation into the incident or non-conformance is to be immediately undertaken by the site supervisor • the identified cause/s is/are to be rectified to prevent additional incidents or non-conformance; for example, sediment control measures may need to be established. <p>Review processes, instigate procedural change and feed back into the management plan.</p>
Responsibilities	Environmental manager
Response timing	<p>Immediate response to any emissions threatening staff and environment.</p> <p>Direct reporting of incident to environmental manager</p>
Review and reporting	<p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>.</p> <p>Review of any observations/incidents in annual MMP reporting.</p>
Responsible agency	<p>Department of Minerals and Energy – section 29 of <i>Mining Management Act</i></p> <p>Department of Health and Families - NT Public Health Act and NT Public Health Regulation</p> <p>Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i></p> <p>Work Place Health and Safety NT</p>
Relevant legislation and standards	<p><i>Work Health and Safety (NUL) Act 2011</i> (NT) under Division 2 Primary Duty of Care (NT)</p> <p><i>Waste Management and Pollution Control Act 1998</i> (NT)</p> <p>Leading Practice Sustainable Development (LPSD) - Airborne Contaminants, noise and vibration</p> <p>Leading Practice Sustainable Development (LPSD) - Biodiversity Management</p> <p>International Erosion Control Associations (IECA) Best Practice Erosion and</p>

AIR QUALITY AND GREENHOUSE GASES MANAGEMENT	
	<p>Sediment Control Guidelines (BPESC) (Books 1-6).</p> <p>New South Wales Department of Environment and Conservation Standards for Dust Deposition</p>

14.4.6 Noise and vibration

NOISE AND VIBRATION MANAGEMENT	
Objectives	Minimise noise emissions and vibrations and mitigate potential impact as far as possible.
Targets	<p>No complaints from staff, contractors or the public.</p> <p>Compliance with legislation and regulatory requirements.</p>
Actions/ measures/ land management	<p>Strategies to be implemented include:</p> <ul style="list-style-type: none"> • Avoidance if practicable, and design activities to minimise noise and vibration. • ABM staff and contractors will ensure the equipment is maintained to reduce any noise emissions impacting 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. • ABM will establish a minimum 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. • Employees will be trained in the appropriate use and application of machinery to minimise noise emissions as far as practicable. • 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.
Performance indicators/ criteria	Number of noise and vibration complaints
Monitoring	<p>Monitoring will incorporate:</p> <ul style="list-style-type: none"> • 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

NOISE AND VIBRATION MANAGEMENT	
	<p>hazards that require action or control measures.</p> <ul style="list-style-type: none"> • 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.
Corrective actions	<p>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.</p> <p>All external complaints will be investigated by the environmental manager or health and safety manager and when required actions taken to resolve the matter.</p>
Responsibilities	<p>Health and safety manager</p> <p>Environmental manager</p> <p>This plan will be implemented in the induction for all staff and contractors.</p>
Response timing	<p>Immediate response to any noise emissions and vibration issues threatening staff and environment.</p> <p>Direct reporting of incident to health and safety manager and environmental manager.</p>
Review and reporting	<p>As part of ongoing consultation and engagement with the CLC information will be provided on any issues or incidents that have been the result of excessive site noise and vibrations.</p> <p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>, and Work place Health and Safety NT in accordance with <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care</p> <p>Review of any observations/incidents in annual MMP reporting.</p>
Responsible agency	<p>Department of Minerals and Energy – section 29 of <i>Mining Management Act</i></p> <p>Work place Health and Safety NT - <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care</p>
Relevant legislation and standards	<p><i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care</p> <p><i>Waste Management and Pollution Control Act 1998</i> (NT)</p> <p>NOHSC:1007 (2000) - National Standard for Occupational Noise.</p> <p>AS/NZS 1269.3:2005 - Occupational noise management – hearing protector program</p> <p>LPSD - Airborne Contaminants, noise and vibration</p> <p>Code of Practice- Worksafe – Managing and preventing hearing loss at work</p>

14.4.7 Waste

Waste generated at the Twin Bonanza project can be divided into mineralised waste (as a by-product of the extraction and processing of the ore that includes tailings and waste rock) and non-mineralised waste (generated through the general operating processes on site).

14.4.7.1 Mineralised

MINERALISED WASTE MANAGEMENT	
Objectives	<p>To prevent waste rock and tailings from impacting the surrounding environment.</p> <p>To optimise the use of rehabilitation materials (waste rock) to ensure rehabilitation success.</p>
Targets	<p>Construction of tailings dams, concentrate residual dam and waste rock dump in accordance to design.</p> <p>Scheduling of waste rock to ensure required waste rock placement is achieved.</p> <p>Selective stockpiling of sandstone and siltstone for rehabilitation.</p> <p>Management of tailings dam and concentrate residual dam in line with operating strategy.</p>
Actions/ measures/ land management	<p>Management and mitigation measure will include:</p> <ul style="list-style-type: none"> • Material that has the potential to generate small volumes of acid will be contained within non-acid forming material (NAF) material to reduce any negative effects on the environment through leaching. • Approximately 1 to 2 tonnes of this material will be leached with cyanide to recover fine gold. Prior to deposition in the lined CRD, the cyanide will be recovered and detoxified. • Integrity of tailings dam wall and/or concentrate residual dam. <ul style="list-style-type: none"> ○ Appropriate design, construction and operation of facility to ensure structural integrity is maintained; in accordance to the principles of the ANCOLD Guidelines. ○ Regular independent inspections. Quality control during dam construction. ○ Manage the freeboard of the facility and ensure that the facility is not used for water storage, to prevent water ponding. • Prevent tailings pipeline leak. <ul style="list-style-type: none"> ○ Appropriate design, construction and operation of facility to ensure structural integrity is maintained; in accordance to the principles of the ANCOLD Guidelines. ○ Regular inspections of pipelines. Quality control during construction.

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	<ul style="list-style-type: none"> ○ Pipelines located in earthen bunds. ● Tailings dam seepage. <ul style="list-style-type: none"> ○ Facility designed in accordance to the tailings characterisation work. ○ Leach residuals reporting to a separate CRD. ○ Position the tailings dam to limit seepage and construct a low permeability layer. Installation of monitoring bores and if required, recovery bores. ○ Position the facilities in mineralised soils with similar elevated elements. ● Prevent overtopping of tailings dam. <ul style="list-style-type: none"> ○ Monitor the deposition of tails and freeboard to ensure available capacity and prevent subsequent overtopping; in accordance to ANCOLD Guidelines. ○ Design the facilities with a spillway for a probable maximum flood event. ● Prevent sediment from waste dump <ul style="list-style-type: none"> ○ Undertake erodability testing and design outer batters based on physical characteristics of the material. Assessment undertaken external batters covered by competent sandstone. ● Prevent liberation of leachates from waste dump <ul style="list-style-type: none"> ○ Undertake AMD and water leach tests, and design the waste dump based on the chemical nature of the material. Testing has highlighted that it is unlikely that AMD or potential leaching will occur. ● Prevent waste dump from inhibiting surface water flow <ul style="list-style-type: none"> ○ Complete surface water modelling and position waste dump according to results. Waste dumps positioned in areas with small catchments and limited surface water intersection. ● Reduction and/or fragmentation in threatened species habitat <ul style="list-style-type: none"> ○ Siting of infrastructure in areas that will least impact threatened species. ○ Adhere to agreed clearing boundaries as part of the EIS approval. ○ Manage clearing in accordance with the Biodiversity Management Plan.
Performance indicators/ criteria	<p>Acceptable levels of sediment liberated into the environment from the waste rock dumps and tailings dam.</p> <p>No failure of tailings dam walls.</p> <p>Build waste rock dump to design.</p>

MINERALISED WASTE MANAGEMENT	
	Build tailings dam to design.
Monitoring	<p>Monitoring of the tailings dam and CRD is to include both geotechnical and geochemical monitoring. Geochemical monitoring will include surface water and groundwater to monitor for potential changes in water quality over time from the existing site conditions.</p> <p>The proposed operational monitoring will be extended to include the closure phase to ensure a continuous series of data is available to aid in demonstrating the trends in water quality and levels over time.</p> <p>Monitoring of the waste dumps will include elements of sediment, erosion and geochemical monitoring. Geochemical monitoring will include surface water and groundwater to monitor for potential changes in water quality over time from the existing site conditions. Monitoring will encompass:</p> <ul style="list-style-type: none"> • monthly checks of groundwater quality from bores around the waste rock dumps to detect changes in water quality • visual assessment of erosion after rainfall events • monitoring of dust as part of air quality • monitoring of surface water will only occur when surface water flows are present due to the distinct wet season and semi-arid Tanami climate.
Corrective actions	<p>If an incident occurs, investigate then instigate procedural change. If deemed necessary further workforce training.</p> <p>Review processes and feed back into site management.</p> <p>Notify appropriate authorities if required.</p>
Responsibilities	Environmental manager
Response timing	Immediate response to any waste rock or tailings risks impacting staff and environment. Timeframe for remediation dependent on nature of issue.
Review and reporting	<p>Reporting of monitoring data in annual update of MMP.</p> <p>Report any significant issues as an incident to DME, in accordance with section 29 of the <i>Mining Management Act</i>.</p>
Responsible agency	<p>Department of Minerals and Energy</p> <p>Environmental Protection Agency (EPA)</p>
Relevant legislation and standards	<p>The regulatory requirements governing waste management in the Northern Territory are contained within the following legislation:</p> <ul style="list-style-type: none"> • <i>Waste Management and Pollution Control Act 1998</i> (NT) • <i>Waste Management and Pollution Control (Administration) Regulations 2001</i> (NT) • <i>Water Act 1992</i> (NT) • <i>Mining Management Act 2001</i> (NT)

MINERALISED WASTE MANAGEMENT	
	<p>Regulations and guidelines that are applicable and have been consulted are outlined below:</p> <ul style="list-style-type: none"> • ANCOLD Guidelines - Guidelines on tailings dams; planning, design, construction, operation and closure. • AS 1726-1993 - Geotechnical site investigations • LPSD - Tailings Management • LPSD - Water Management • LPSD - Managing Acid and Metalliferous Drainage 2007 • GARD Guide - best practices and technology to address AMD issues • TEAM NT: Technologies for the Environmental Advancement of Mining in the Northern Territory, Toolkit. • Mine Wastes. Characterisation, Treatment and Environmental Impacts (Lottermoser, B., 2007)

14.4.7.2 Non-Mineralised

Waste generated during the operations of the Twin Bonanza project will vary in volumes and type compared to the construction phase, however the overall waste management practices will be the same. In some cases with the staged approach construction may occur concurrently with operations as such waste management detailed in section 14.4.7.1 is applicable to operational activities.

14.4.8 Rehabilitation

Refer to 14.5 for how the company will meet its rehabilitation commitments during the operations of the project.

14.4.9 Community

14.4.9.1 Cultural & Heritage

CULTURAL & HERTIAGE MANAGEMENT	
Objectives	<p>To protect cultural heritage and Aboriginal archaeological sites.</p> <p>To ensure that operations do not inhibit traditional land management practices.</p> <p>To minimise the impact on aesthetic values and the cultural landscape.</p>
Targets	<p>No unapproved cultural heritage sites disturbed.</p> <p>Prevention of unplanned economic social impacts on local community.</p>

CULTURAL & HERTIAGE MANAGEMENT	
	<p>No adverse effect to traditional land management practices.</p> <p>No inadvertent impact on aesthetic and cultural values for local communities.</p>
<p>Actions/ measures/ land management</p>	<ul style="list-style-type: none"> • ABM will maintain a register of sites and these sites will be marked on maps, development plans and advertised at the site (unless the location of the site is deemed confidential by the CLC). • All employees and contractors will be advised of cultural and heritage sites, as well as exclusion zones. • ABM will conduct surveys of any sites that are subject to development or disturbance. These surveys will be conducted by professional practitioners and where applicable will be carried out in conjunction with the CLC. • In addition, members of ABM staff will be trained on how to identify new areas. Posters will be put up in common areas stating the plan and how to recognise new sites. • All new sites will be reported to executive management who will report the findings to the CLC and other government organisations as appropriate. • ABM and employees will adhere to a “IF IN DOUBT – MARK IT OUT” policy to areas of potential new sites. Should an employee identify a potential site they will mark it out with blue pegs (as below) and not disturb the site until an archaeological survey can be arranged by ABM. • Ongoing consultation with underlying landholder, through the CLC, under the Aboriginal Land rights Act 1976. The engagement process will include topics such as design of waste rock dumps, tailings dams and closure. • Ensure all practices are in line with ABM’s social impact assessment (SIA) and Social Impact Management Plan (SIMP). • Infrastructure and operations aimed at maintaining aesthetic and cultural values for local communities, where practicable. • Designing of waste rock dumps and tailings dams to integrate into the surrounding environment upon closure.
<p>Performance indicators/ criteria</p>	<p>No un-authorized disturbance of archaeological and CLC designated sacred sites.</p> <p>No recorded disturbance of cultural heritage sites.</p> <p>No unplanned economic social impacts on local community.</p> <p>Level of feedback and concerns raised at on ground meetings on the operations effect on cultural values and traditional land management practices.</p>

CULTURAL & HERTIAGE MANAGEMENT	
<u>MONITORING</u>	<p>Regular meetings and communication with the CLC to ensure all practices are in line with ABM’s SIA, SIMP and legal agreements with the CLC.</p> <ul style="list-style-type: none"> • On a quarterly basis the environmental manager will monitor all sites for disturbance. A quarterly report will be presented to ABM’s board of directors. • Notification of any accidental disturbance to the relevant authorities. • Evidence of notification of the new sites to the CLC and the relevant authorities.
Corrective actions	<p>A register of all external communications relevant to the mine’s operations will be maintained in ABM Incident and Complaints Register. This will incorporate any details from on-country meetings. This will lead to an appropriate action to overcome the problem.</p>
Responsibilities	<p>Managing director</p> <p>COO</p> <p>Environmental manager</p>
Response timing	<p>Immediate response to any cultural issues time taken to overcome the problem reflects the nature of the matter.</p>
Review and reporting	<p>ABM has a policy to notify the relevant authorities, including the CLC and relevant government agencies, if deemed appropriate, should any new sites be identified.</p> <p>Any relevant complaints and enquiries for the calendar year will also be reported in the MMP under the <i>Mining Management Act 2001</i> and to the CLC and Traditional Owners through on ground meetings, discussing the scope and project direction, and through technical reporting under the mining agreement with the CLC.</p> <p>ABM will maintain mechanisms to update this CHMRP, particularly recognising new and emerging issues and implementation into the plan. These mechanisms include:</p> <ul style="list-style-type: none"> • reporting quarterly to the board on any issues of cultural heritage risk or impact • making all employees aware of the CHMRP, and providing regular opportunity for feedback they have been receiving in the wider community • the indigenous liaison officer reporting regularly to senior management (In the case of Indigenous Australians) • allowing open and honest dialogue with the CLC and Traditional

CULTURAL & HERTIAGE MANAGEMENT	
	<p>Owners.</p> <p>The CHMRP will be updated at least annually to reflect any findings.</p>
Responsible agency	<p>Department Lands, Planning and Environment</p> <p>CLC –Central Land Council - under the <i>Aboriginal Land rights Act 1976</i></p>
Relevant legislation and standards	<p><i>Aboriginal Land Act 1980</i> (NT)</p> <p><i>Northern Territory Aboriginal Sacred Sites Act 1989</i> (NT)</p> <p><i>Native Title Act 1993</i> (Cth)</p> <p><i>Aboriginal Land Rights (Northern Territory) Act 1976</i> (Cth)</p> <p><i>Environmental Assessment Act 1982</i> (NT)</p> <p><i>Mining Management Act 2001</i> (NT)</p> <p><i>Heritage Conservation Act 1991</i> (NT)</p> <p>Social Impact Assessment: Guideline to preparing a social impact management plan - Queensland Government</p> <p>LPSD - Community Engagement</p> <p>LPSD - Working with Indigenous Communities</p> <p>LPSD - Community Engagement</p>

14.4.9.2 Social

SOCIAL MANAGEMENT	
Objectives	<p>Maximise the positive effect on the surrounding communities while minimising the negative effect.</p>
Targets	<p>Prevention of unplanned economic social impacts on local communities.</p> <p>No environmental degradation across the entire ecosystem that has an effect on local communities.</p> <p>No complaints about social and community impacts.</p>
Actions/ measures/ land management	<ul style="list-style-type: none"> • Adoption of appropriate health and safety practices. • Ongoing consultation with underlying landholder and communities, through the CLC, under the <i>Aboriginal Land Rights Act 1976</i>. • Ensure all practices are in line with ABM's SIA and SIMP. • Appropriate implementation of the environmental management and mitigation measures. • ABM will adhere to agreements with the Traditional Owners (that make up the local communities) and the CLC.

SOCIAL MANAGEMENT	
	<ul style="list-style-type: none"> • Traditional Owners are not to be denied access to any part of the project area or surrounding lands for hunting or bush food gathering (except for reasons of mine-safety). • As per agreements with the Traditional Owners, should there be roles that become available for which local people are suitable or may be trained for, ABM must seek to employ via the communities first. • The company will prioritise and select service providers on a best efforts basis, within the reasonable expectation of free-market principals / efficiency of service based on their locality and proximity to the project area. • Timely response to community and stakeholder concerns.
Performance indicators/ criteria	<p>Number of health and safety incident concerning either staff or community involving ABM.</p> <p>Formal engagement with Traditional Owners</p> <p>Positive contributions to the community including grants, employment and delivery of local services.</p>
Monitoring	<p>Regular meetings and communication with the CLC to ensure all practices are in line with ABM's SIA, SIMP and legal agreements with the CLC.</p> <p>Ongoing consultation with underlying landholder and local communities, through the CLC, under the <i>Aboriginal Land Rights Act 1976</i>.</p>
Corrective actions	<p>Corrective actions may include:</p> <ul style="list-style-type: none"> • working with local communities to resolve and rectify issues and concerns • responding to valid complaints • increasing variety of training available • establishing reasons for leaving / absenteeism and try to remedy • discussing with CLC and Traditional Owners programs available for funding • approaching schools, sporting groups, cultural groups etc with offers of sponsorship • assessing impact on restricted entry around the mine site and implement changes as per the plan • consulting with affected peoples to see if new areas can be offset programs can be implemented • searching for new businesses to supply and offer tender in local /

SOCIAL MANAGEMENT	
	regional centres.
Responsibilities	Managing director COO Environmental manager
Response timing	Immediate response to any social compliant or concerns raised by the local community.
Review and reporting	<p>Complaints and enquiries for the calendar year will also be reported in the MMP under the <i>Mining Management Act 2001</i> and with the CLC and Traditional Owners through on ground meetings, discussing the scope and project direction, and through technical reporting under the mining agreement with the CLC.</p> <p>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/inquiry, response and corrective actions.</p> <p>ABM has mechanisms in place to update the SIMP, particularly recognising new and emerging issues and implementation into the plan. These mechanisms include:</p> <ul style="list-style-type: none"> • reporting quarterly to the board on any issues of social impact • making all employees aware of the SIMP, and providing regular opportunity for feedback they be receiving in the wider community • having the Indigenous liaison officer reporting regularly to senior management • conducting an annual economic and social impact assessment, similar to that presented in the EIS • allowing open and honest dialogue with the CLC and Traditional Owners. <p>The SIMP will be updated at least annually to reflect any findings.</p>
Responsible agency	Department Lands, Planning and Environment CLC –Central Land Council - under the <i>Aboriginal Land rights Act 1976</i>
Relevant legislation and standards	<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)</p> <p><i>Aboriginal Land Rights (Northern Territory) Act 1976</i> (Cth)</p> <p><i>Environmental Assessment Act 1982</i> (NT)</p> <p><i>Mining Management Act 2001</i> (NT)</p> <p><i>Heritage Conservation Act 1991</i>(NT)</p>

SOCIAL MANAGEMENT	
	<p><i>Aboriginal Land Act 1980</i> (NT)</p> <p><i>Work Health and Safety (National Uniform Legislation) Act (and related Regulations)2007</i> (NT)</p> <p>Social Impact Assessment: Guideline to preparing a social impact management plan - Queensland Government</p> <p>LPSD - Community Engagement</p> <p>LPSD - Working with Indigenous Communities</p> <p>LPSD - Community Engagement</p>

14.4.10 Biting insects

The staged approach to the project means that biting insects management will be the same for operations as it is for construction. Refer to section 14.3.9 - all details will be relevant for both construction and operation.

14.4.11 Chemicals and dangerous goods

DANGEROUS GOODS MANAGEMENT	
Objectives	To ensure that transport, storage and handling of dangerous goods on-site does not cause environmental harm or harm to persons.
Targets	<p>No harm to environment or persons resulting from transport, storage and handling of dangerous goods.</p> <p>Compliance with the required standards for the transport, handling and storage of chemicals and hazardous goods.</p> <p>No complaints from staff, contractors or the public.</p>
Actions/ measures/ land management	<ul style="list-style-type: none"> • Documented risk assessment conducted prior to working with hazardous substances and repeated any time the scope of work changes or any surrounding conditions change. • Field personnel will respond to an emergency situation as described in the Emergency Response Management Plan. • Any licences required for storage will be obtained. • Bunding will be inspected for damage regularly and repaired as soon as is practicable if any damage is detected. • Hazardous substances will be stored on site in accordance with the relevant legislative requirements MSDS's and guidelines. • Key personnel will be trained in the appropriate handling of the various chemicals to be stored on site. • A qualified person will be appointed as site safety adviser and will have on-site a set of the relevant MSDS for hazardous and dangerous materials. • Spill kits will be available where hazardous materials are used and

DANGEROUS GOODS MANAGEMENT	
	<p>stored and personnel trained in correct use.</p> <ul style="list-style-type: none"> • Refuelling shall not be done within 100 metres of a watercourse. • New hazardous substances required for use must have approval from the safety and environmental coordinators prior to transport and use on site. This ensures that the products are reviewed for potential risks to health and the environment in their use. • The personnel responsible for receiving hazardous substances shall ensure that chemical deliveries are labelled in accordance with the Code of Practice for the Labelling of Workplace Hazardous Substances and any damaged packages are returned to the supplier. • The area supervisor shall maintain an inventory for each separate hazardous substance storage area on site. • No asbestos or asbestos containing substances shall be brought onto site. • Paints and polyurethane containing iso-cyanates shall not be used, unless prior written approval is obtained from the site general manager. • Synthetic mineral fibres (glass fiber, rock wool and ceramic fibers) shall be only brought onto site with prior written approval from the site general manager. • No radioactive substances or equipment containing or requiring radioactive sources for operation shall be brought onto site without approval from the site general manager. • Storage facilities for all Hazardous Substances and Dangerous Goods shall comply with the Dangerous Goods Act 2012 (NT) and Dangerous Goods Regulations 2012 (NT), prior to storing hazardous substances on site to ensure that the necessary licenses or exemptions are clarified. • Where required by the <i>Dangerous Goods Act 2012</i> (NT) storage areas shall be contained within bunds. Bund construction shall comply with AS1940:1993 The Storage and Handling of Flammable and Combustible Liquids and regulatory requirements. In the event of inconsistency, regulatory requirements shall be followed. • The site general manager is responsible for ensuring that all waste and unused hazardous substances are removed from site in accordance with legislative requirements. <p>PPE is considered the last line of defence against hazardous substances. Material Safety Data Sheets (MSDS) normally contain recommendations on the selection and use of PPE for the particular materials being used. Supervisors shall ensure that:</p> <ul style="list-style-type: none"> • protective devices are selected which are suitable for the individual and give the required level of protection from the risks associated with the particular task • all PPE meets relevant Australian Standards • use of correct PPE is enforced • PPE is readily available, clean and functional, and employees are individually fitted

DANGEROUS GOODS MANAGEMENT	
	<ul style="list-style-type: none"> • there is a proper instruction on the need for, and correct use of, personal protective clothing • an effective system of cleaning and maintenance for PPE is implemented.
Performance indicators/ criteria	<p>No harm to environment or persons resulting from transport, storage and handling of dangerous goods.</p> <p>No complaints from staff, contractors or the public.</p>
Monitoring	<p>Storage facilities will be inspected regularly (at least weekly) and any resulting recommendations and corrective actions shall be implemented.</p> <p>Records in Environmental Observations and Incident Register.</p> <p>Administration controls consist of properly designed and implemented work practices and procedures and may include:</p> <ul style="list-style-type: none"> • safe work procedures that describe the correct methods for performing all activities associated with storing, handling and disposing of dangerous goods • training and supervision to provide the necessary knowledge and skill and ensure correct procedures are followed safely • good housekeeping, including regular cleaning of contamination from walls and surfaces, dust and drip removal from all work areas, and keeping lids on containers when not in use • workplace monitoring to ensure safe working conditions is maintained.
Corrective actions	<p>Corrective actions may include:</p> <ul style="list-style-type: none"> • enforcing safe work practices • enforcing PPE use and consider further training and awareness • reviewing practices and amend management plans / procedures in light of review.
Responsibilities	<p>Site general manager</p> <p>Supervisors / area managers</p> <p>Health and safety manager</p>
Response timing	<p>Immediate response to any event threatening staff and environment</p>
Review and reporting	<p>Spills and clean-up are to be documented and reported by the staff and reported to the Environmental Manager</p> <p>Reporting of any incidents internally and to DME in accordance with Section 29 of the <i>Mining Management Act</i>.</p>

DANGEROUS GOODS MANAGEMENT	
	Summary of inspections to be provided in annual MMP reporting. Reporting to NT Worksafe if required.
Responsible agency	Department of Minerals and Energy – section 29 of <i>Mining Management Act</i> Work place Health and Safety NT - <i>Work Health and Safety (NUL) Act 2011</i> under Division 2 Primary Duty of Care Environmental Protection Agency (EPA) - <i>Environmental Assessment Act 1982</i>
Relevant legislation and standards	<i>Work Health and Safety (NUL) Act 2011</i> (NT). <i>Dangerous Goods Act 2012</i> (NT). Work Health and Safety (NUL) Regulations 2012 (NT). AS1940-2004 - The storage and handling of flammable and combustible liquids LPSD - Hazardous Materials Management

14.4.12 Health and safety

The staged approach to the project means that the health and safety management will be handled in the same manner for operations as for construction. Refer to section 14.3.12 - all details will be relevant for both construction and operation.

14.4.13 Incidents and complaints management

INCIDENTS AND COMPLAINTS MANAGEMENT	
Objectives	Manage environmental or social incidents and complaints.
Targets	Immediate action undertaken as soon as possible within receipt of a complaint. Investigations completed within of receipt of a complaint. All corrective actions implemented by the nominated due date.
Actions/ measures	All incidents or complaints about either environmental or social issues will be managed in accordance with the relevant ABM procedure. The procedure requires the following actions to be undertaken: <ol style="list-style-type: none"> 1. Take any necessary immediate action 2. Report the incident or complaint 3. Undertake an investigation (if warranted by regulators and/or management plan) 4. Determine root causes 5. Undertake may necessary corrective or preventative actions

INCIDENTS AND COMPLAINTS MANAGEMENT	
	<p>6. Monitor action implementation</p> <p>7. Audit effectiveness of action</p>
Performance indicators/ criteria	<p>Number of complaints received.</p> <p>Number of complaints resolved within specific timeframe.</p> <p>Effective implementation of appropriate management plans.</p>
Monitoring	The environmental manager will monitor compliance against the targets.
Corrective actions	<p>If further incidents occur or complaints are received in relation to previous occurrences, the following corrective actions will be undertaken (where applicable):</p> <ul style="list-style-type: none"> • additional environmental awareness training of the workforce with respect to the procedures to be followed for environmental incidents or complaints • investigation into why the incident/complaint was not addressed within the specified time frame • undertakING incident/complaint follow-up according to the results of the investigation.
Responsibilities	Environmental manager
Response timing	Immediate action undertaken as soon as possible within receipt of a complaint and/ or notification of review.
Review and reporting	<p>All incidents and complaints will be recorded in the environmental management incident reporting system.</p> <p>Reports of all incidents and complaints will be submitted to ABM's managing director and board.</p> <p>The complainant will be advised of what action, if any, is taken as a result of the complaint.</p>
Responsible agency	Department of Minerals and Energy – section 29 of <i>Mining Management Act</i> .
Relevant legislation and standards	Refer to appropriate management plan.

14.5 Mine Closure Environmental Management Plan

The EMP documents how ABM will fulfil the company’s environmental policy and meet its environmental commitments.

The following section identifies the strategic aspects of mine decommissioning and closure. This section provides a summary of the conceptual closure plan located in Appendix O.

REHABILITATION AND CLOSURE MANAGEMENT	
Objectives	Rehabilitate the disturbed landscape and created landforms to be safe, stable and non-polluting with compatibility to future land use.
Targets	Meet closure objective by satisfying defined completion criteria.
Actions/ measures/ land management	<ul style="list-style-type: none"> • Retaining the topsoil as a viable resource to use for rehabilitation purposes at a later date. • Progressive rehabilitation will be undertaken during the life of the mine, to optimise topsoil properties. • Removal and disposal of equipment and rubbish meet requirements of closure plan. • Final tailings dam and waste rock dump construction to conform to design to prevent failure slumping and significant erosion. • Waste rock managed in accordance to management strategy based on physical and chemical characteristics. • Geotechnical design and capping of tailings dam to maintain stability, manage seepage with acceptable surface water quality. • Surface drainage to downstream environments is retained, or reinstated where possible. • Native plant cover of local provenance, species type and diversity similar to surrounding areas. • Vegetation community that can withstand local fire regime. • Establishment of abandonment bunds and signage to stop inadvertent access to open pits. • Areas contoured back to original ground level will be covered by 100mm of topsoil. Areas above grade including the waste dump and tailings storage will have 100mm of topsoil covering the top surface of the landforms and the outer batters will have rock mulch consisting of blended topsoil and inert sandstone. If required, areas will be seeded with locally collected material with the aid of Traditional Owners. • In the case of the tailings dam the closure principles outlined in the ANCOLD Guidelines on Tailings Dams 2012 will be adhered to. Due to the small scale catchments any water diversion structures left at closure will be designed in consideration of a 1:1000yr peak flow event.

<p>Performance indicators/ criteria</p>	<p>Ground and surface water monitoring demonstrates no discernible changes in background ground and surface water quality.</p> <p>Soil profiles across the site are compliant with the design and closure plan strategy.</p> <p>Results of EFA monitoring indicate that rehabilitation has resulted in:</p> <ul style="list-style-type: none"> • foliage cover and species density within the range of values of the analogue sites in the reference ecosystem • no evidence of listed weed species and buffel grass • Infiltration and Nutrient Cycling Index is within the range of values from analogue sites in the target ecosystem • presence of leaf litter/organic material • erosion is comparable to surrounding environment.
<p>Monitoring</p>	<p>Monitoring of all rehabilitated landforms is proposed to be completed using EFA. The objective of the monitoring is to identify if a rehabilitated site is progressing to be stable, non-polluting, self-sustaining and safe, comparative to the target ecosystem.</p> <p>Erosion monitoring of the tailings dam and waste rock dump is also proposed to be conducted.</p> <p>During operations both surface water and groundwater will be monitored.</p> <p>Rehabilitation monitoring programs will include assessments of vegetation cover, flora diversity, fauna colonisation and the presence of weeds.</p>
<p>Corrective actions</p>	<p>If results of the monitoring programs reveal that the rehabilitation is not meeting the completion criteria set in the Conceptual Mine Closure Plan (CMCP) (i.e. not meeting target vegetation growth, stability etc.), remedial work will be completed to rectify any issues identified with the rehabilitation.</p>
<p>Responsibilities</p>	<p>Environmental manager Managing director COO</p>
<p>Response timing</p>	<p>Immediate response to any event impacting staff, environment and/or infrastructure.</p> <p>Remediation timeframe dependent on nature of issue.</p>
<p>Review and reporting</p>	<p>Following all the rehabilitation work a rehabilitation/compliance audit will be conducted. The audit will focus on identifying any areas where rehabilitation requirements have not been met.</p> <p>The results of all these monitoring programs will be reported annually within the MMP until the completion criteria have been met. Once completion criteria have been met annual monitoring will cease and a report of the results will be submitted to the DME along with all relevant documentation for a certificate of closure to enable the release of the security for Tenement ML 29822.</p>

Responsible agency	Department of Minerals and Energy CLC –Central Land Council - under the <i>Aboriginal Land rights Act 1976</i>
Relevant legislation and standards	<p><i>Mining Management Act 2009</i> (NT) <i>Environmental Assessment Act 1982</i> (NT) <i>Aboriginal Land Rights(Northern Territory) Act 1976</i> (Cth)</p> <p>ABM in the course of establishing the CMCP has followed the principles and objectives identified in the Strategic Framework for Mine Closure (ANZMEC, 2000).</p> <p>In addition, the following documents were also used to guide the development of the methodology for the delivery of the project:</p> <ul style="list-style-type: none"> • Leading Practice Sustainable Development in Mining Handbooks <ul style="list-style-type: none"> ○ A Guide to Leading Practice Sustainable Development in Mining ○ Evaluating Performance: Monitoring and Auditing ○ Mine Closure and Completion ○ Mine Rehabilitation ○ Risk Management ○ Tailings Management • Planning for Integrated Mine Closure: Toolkit (ICMM 2008) • Guidelines for Preparing Mine Closure Plans (Department of Mines and Petroleum Western Australia/EPA, 2011). • Mine Close out Objectives, Life of Mine Planning Objectives, Advisory Note (Department of Mines and Energy 2008)

14.6 Environmental performance reporting

Site and management personnel will be made aware of issues regarding the project's environmental performance.

A written report of non-conformance, to include failures to meet the 24 hour deadline for reporting spills and other incidents) will be reported to site manager and environmental manager. Details provided will include the date, type and location of the non-conformities, how the non-conformities occurred and the corrective action employed.

The environmental manager should monitor environmental performance additional strategies or training will be developed / implemented when environmental strategies do not attain the management objective. Records will be kept, along with a Non-Conformance Register.

Non-conformities (e.g. serious spills) or other requiring reporting will be made to the appropriate agency within time limits specified in legislation.

Documentation of environmental management activities will be held on site and in the Perth office; and will be available to all key personal.

Reports to DME on environmental performance will be made as required by the MMP. In the case of serious environmental incidents reporting will occur in accordance to section 29 of the *Mining Management Act 2001*.

All environmental management is subject to continual review and improvement as required.