

**FINAL GUIDELINES FOR THE PREPARATION OF AN ENVIRONMENTAL IMPACT
STATEMENT**

**TWIN BONANZA 1 GOLD MINE
ABM RESOURCES NL**

JULY 2013

1	Introduction.....	1
2	General Advice on EIS.....	2
2.1	General Content.....	2
2.2	Format and Style.....	2
2.3	Administration.....	3
2.4	Public Exhibition.....	3
3	Description of the Proposed Development.....	4
3.1	General Information.....	4
3.2	Description of the Proposal.....	4
3.2.1	Project components.....	5
3.3	Alternatives.....	8
4	Risk Assessment.....	9
4.1	Risk Assessment Approach.....	9
4.2	Socio-economic risks.....	10
4.3	Risks to Historic and Cultural Heritage.....	12
4.4	Risks to Biodiversity.....	13
4.5	Risks to hydrology and surface water quality.....	15
4.6	Rehabilitation and Mine Closure.....	16
4.7	Other Issues.....	18
5	Environmental Management.....	18
6	Public Involvement and Consultation.....	19
7	Government Policy and Guidance Notes.....	19
7.1	Environmental Offsets.....	19
7.2	Public Health Premises and Food Premises.....	20
7.3	Water Supply.....	20
7.4	Wastewater.....	20
7.5	Waste discharge.....	20
7.6	Solid waste storage and disposal.....	20
7.7	Mosquito Breeding.....	20

1 Introduction

ABM Resources NL (the Proponent) intends to develop the Twin Bonanza 1 gold mine and associated processing facilities (the Project) in the Tanami Region of the Northern Territory. The Project is within Mining Lease Area (MLA) 29822 which is located approximately 527km west of Tennant Creek, and 14km east of the Northern Territory and Western Australia border. The mine will require the excavation of a series of open pits with the aim of extracting gold. The Proponent has stated in its Notice of Intent (NOI) that the action involves the construction and operation of the following components:

- a series of open pits (including cutbacks) down to a maximum depth of ~100m using drill, blast, load and haul techniques;
- installation of associated water storage and tails dams;
- the installation and operation of gravity processing equipment for refining ore;
- installation of ancillary infrastructure, including: generators/power plants, staff accommodation, workshop and office areas;
- reverse osmosis plant for producing potable water;
- upgrading and lengthening of the existing Bonanza airstrip;
- upgrade of existing, and construction of new, access roads around the proposed mine site; and
- sourcing of water initially from within MLA 29822 from two bore locations and a borefield.

The Proponent predicts that the Project will have an initial open pit mine life of 3-4 years. This estimate is based on a short term extraction rate of between 200 000 and 300 000 tonnes per annum. Should any additional resources be identified, the proponent notes that the life of the open pit mine may extend beyond 3-4 years. Additional mining activities, including underground mining will require further investigation and for this reason have not been included within the scope of this action.

On 11 January 2013, the Proponent referred a NOI for the Project to the Department of Mines and Energy for consideration under the *Mining Management Act*. On 15 May 2013, the Northern Territory Environment Protection Authority (NT EPA) determined that the Project required assessment under the NT *Environmental Assessment Act* (EA Act) at the level of an Environmental Impact Statement (EIS). Issues contributing to the decision include:

- the potential for the action to impact sites with Indigenous and non-indigenous cultural or archaeological significance;
- the clearing and loss of potential habitat and individuals of a number of species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Territory Parks and Wildlife Conservation Act* (TPWC Act);
- an increased risk of environmental damage or degradation to the site. In the absence of suitable mitigation or management measures, ongoing degradation could result in significant impacts to the environment, in particular flora and fauna and remnant vegetation;
- potential ongoing impacts to groundwater resources through the establishment and abstraction of water from at least two bores and a borefield;
- uncertainty around the scope of the Project in relation to the scale, size and complexity of all components;
- the potential for ongoing land degradation and impacts associated with the management and disposal of wastewater and other contaminants; and

- based on the information provided and in the absence of further assessment or analysis, the introduction and operation of a new development with associated infrastructure is likely to significantly alter the current social and economic aspects of the region.

The Project was referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) on 13 March 2013. On 23 April 2013, the Project was determined to be a controlled action under the EPBC Act as it has the potential to significantly impact listed threatened species and communities (sections 18 & 18A).

On 16 May 2013, the Australian Government decided that it would accredit the Northern Territory's EIS process under the *Environmental Assessment Act* for the purposes of assessing this action.

2 General Advice on EIS

2.1 General Content

The EIS should be a stand-alone document. It should contain sufficient information to avoid the need to search out previous or additional, unattached reports.

The EIS should enable interested stakeholders and the NT EPA to understand the environmental consequences of the proposed development. Information provided in the EIS should be objective, clear, succinct, and easily understood by the general reader. Maps (using an appropriate scale, resolution and clarity), plans, diagrams and other descriptive detail should be included. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

The level of analysis and detail in the EIS should reflect the level of significance of the expected and potential impacts on the environment, as determined through adequate technical studies. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which a limitation, if any, of available information may influence the conclusions of the environmental assessment should also be discussed.

Information materials summarising and highlighting risks of the Project should be provided in a culturally appropriate format and language, where relevant.

2.2 Format and Style

The EIS should be produced on A4 size paper capable of being photocopied, with any maps, diagrams or plans on A4 or A3 size paper, and in colour, if possible.

The EIS should comprise of three elements:

- Executive summary

The executive summary must include a brief outline of the Project and each chapter of the EIS, allowing the reader to obtain a clear understanding of the proposed Project, its environmental implications and management objectives. It must be written as a stand-alone document, able to be reproduced on request by interested parties who may not wish to read the EIS as a whole.

- Main text of the document

The main text of the EIS should include a list of abbreviations, a glossary to define technical terms, acronyms and abbreviations, and colloquialisms. The document should consist of a series of chapters detailing the level of significance of the expected and potential impacts on the environment from the Project.

- Appendices

The appendices must include detailed technical information, studies or investigations necessary to support the main text that can be made publicly available, including:

- A table listing how these Guidelines have been addressed in the EIS, cross-referenced to chapters, page numbers and/or appendices;
- An outline of the relevant legislation, codes, standards and guidelines applicable to the Project;
- A list of persons and agencies consulted during the EIS;
- The names of, and work done by, the persons involved in preparing the EIS; and
- The qualifications and experience of the people involved in work contributing to the EIS.

The EIS must be written so that any conclusions reached can be independently assessed. All sources must be appropriately referenced using the Harvard Standard. The reference list should include the address of any internet pages used as data sources. All referenced supporting documentation must be available upon request.

2.3 Administration

The Proponent should lodge ten, bound, hard copies and an electronic (Adobe PDF format) copy of the EIS with the NT EPA and two bound hardcopies with the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). The electronic copies should be provided both as a single file of the entire document and separate files of the document components. Additionally, a Microsoft Word copy of the EIS should be provided to facilitate the production of the Environmental Assessment Report. Proponent should consider the file size, the number of files, format and style of the document appropriate for publication on the NT EPA website. The capacity of the website to store data and display the material may have some bearing on how the document(s) are constructed.

Hard copies of the EIS document should be offered to all neighbours of the Project, and other significant stakeholders.

At a minimum, the Proponent is to advertise when the EIS will be available for review and comment in *The Centralian Advocate*, *Tennant and District Times* and *NT News*.

Please note that the NT EPA requires the EIS document and a draft of the advertisement at least one week prior to advertising the draft EIS, to arrange web upload of the document, and review and comment on advertising text.

2.4 Public Exhibition

The EIS should be made available for public exhibition at:

- NT Environment Protection Authority, 2nd Floor, Darwin Plaza, 41 Smith Street Mall, Darwin;
- Mines and Energy Information Centre, Department of Mines and Energy, 3rd Floor, Paspalis Centrepont, 48 Smith Street Mall, Darwin;
- Department of Lands, Planning and the Environment, Floor 1, Alice Plaza Building, Todd Street Mall, Alice Springs;
- Central Land Council, 27 Stuart Hwy, Alice Springs;
- The Australian Government Department of Sustainability, Environment, Water, Population and Communities Library, John Gorton Building, Parkes, Canberra; and
- Northern Territory Library, Parliament House, Darwin.

The EIS exhibition period should not occur in late December or January in any year to ensure optimal opportunity for public and Government viewing of the EIS document. Additional time will be added to the EIS exhibition period if the EIS exhibition overlaps any Christmas and January periods.

3 Description of the Proposed Development

3.1 General Information

The EIS should provide a brief background and context to the Project, including:

- The title of the Project;
- The full name and postal address of the Proponent;
- An explanation of the objectives, benefits and justification for the Project;
- The Project's location in the region and its proximity to landmark features, sites of cultural/social significance, regional community centres, and sensitive environments such as major waterways, significant groundwater resources, significant natural features, conservation reserves and any areas on the National Reserve System;
- Details of the Proponent's environmental record, including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Proponent;
- Climate and atmospheric characteristics relevant to the Project (e.g. air quality, wind speed and direction, seasonal temperatures, humidity, wind, evaporation, extreme events and rainfall);
- Agreements between the Northern Territory Government, land manager(s) and the Proponent;
- The background to the development of the Project including discussion of previous environmental impact assessment and overview of historic mining activities;
- Identification of areas under exploration which may be mined in future, or any other potential future activities being planned;
- How the Project relates to any other proposals or actions (of which the Proponent should reasonably be aware) that have been or are being taken, or that have been approved in the region;
- National and Northern Territory standards, codes of practice and guidelines which may be relevant to the Project;
- An overview of the schedule for the whole Project; and
- The current status of the Project.

3.2 Description of the Proposal

The EIS should identify all the processes and activities intended for the Project, and any associated ancillary activities, during the life of the Project. As background to discussion of specific components, the following should be included:

- An outline of the geology of the area including:
 - A summary of the results of studies and surveys undertaken to identify the extent of the resource within the Project area;

- Geological properties of the Project site including the results of studies to identify sulphidic ores;
- Characterisation of waste rock, the ore which is to be mined and any waste material associated with the ore body; and
- The results of geotechnical studies undertaken for the purposes of designing open pit(s), waste rock dump(s), tailing storage facility(s) and water storage facility(s).
- Delineation of the Project footprint using detailed maps and diagrams, including:
 - Location of the resource/s to be explored, developed or mined;
 - All areas to be cleared or disturbed (including mine, haul roads, product stockpiles and other infrastructure), both for the life of the Project and temporarily, prior to rehabilitation;
 - The location of any works to be undertaken, structures to be built or elements of the proposed Project. Where relevant this must include, but is not limited to, the location of the mine, water extraction points and storage facilities, roads, airfield, accommodation village or construction camp/s, hard stands, stockpiles (soil/ore/waste rock), haul roads, product export facilities; and
 - Additionally, data should be provided to the NT EPA as importable GIS shape files (compatible with ArcMap) with relevant features and areas marked as polygons, lines and points, and any relevant geospatially referenced underlays also included.

3.2.1 Project components

Mine

Provide the following relevant information which relates to mining activities for the Project:

- Timetable for construction including staging of construction activities;
- Vegetation to be cleared and disposal of consequent plant matter;
- Methods of mine construction, including estimates of the volume of materials required;
- Sources of clay for tails dam construction; and
- Details of the plant and machinery required.

Provide specific details on the following aspects of operation:

- Mining types and methods, including the major equipment to be used in the various components of the operation;
- Handling/stockpiling of topsoil and waste materials;
- Quantity of material to be mined, ore produced and waste rock generated annually, and any proposed ramping up of production or staging of development;
- Methods for dewatering in the event that any proposed pits intersect possible water holding geological structures such as palaeochannels. The discussion should include details of the storage, treatment, usage and disposal;
- Provide a conceptual pit design and waste rock dump design that provides an indication of their scale in relation to existing surrounding landscape; and
- Timetable for operation of the mine including the targeting of each prospect or deposit.

Processing

Provide relevant information with respect to the processing plant, including but not limited to:

- Clearing and preparation of the site;
- Transport of materials to the site and assembly of the plant;
- Ore processing method, including flow diagrams;
- The recovery method proposed (including flow diagrams);
- Describe the waste streams, tailings and emissions produced from the processing activities; and
- The content and methods for disposal of tailings and screenings.

Road transport

Identify proposed routes for transport of construction materials, personnel, product and supplies for the Project, including use of existing transport infrastructure. Details of proposed road construction and/or upgrades should be provided, including:

- Precise locations (including maps) of existing and new road infrastructure;
- Maximum width of road corridors required for construction;
- Plant and machinery required;
- Vegetation clearing methods and disposal of plant matter following clearing;
- Location of campsites for construction crews, if required;
- The results of surface water investigations in and around proposed road structures;
- Sources of water;
- Sources of construction inputs and materials;
- Methods including crossing techniques which will be used when bisecting creeks or linear infrastructure (provide cross section diagram/s);
- Timeframes for transport infrastructure construction/upgrade;
- Design requirements, Legislative approvals and/or requirements which will be applicable to the construction of access points onto the Tanami Road; and
- Ongoing provisions for transport infrastructure maintenance, including source and extraction of maintenance inputs and materials.

Details of road use should be provided including:

- Type, size and number of vehicles required during all phases of the Project;
- Estimated frequency of Project vehicle use on public roads;
- Methods to convey all site traffic (including materials, workers and product) to and from the site;
- Routes for transport, including details of proposed routes for over-dimension or very heavy loads;
- Details of the method of truck loading and load constraint;
- Peak user times for vehicular movements by staff/contractors along the Tanami Road;
- Hazardous or dangerous material which may be transported;
- Additional transport infrastructure works required, including site access and signage; and
- Hours of operation.

Water

- Provide information on the quantity, quality, source (groundwater including existing bores and borefields, surface water), storage, and infrastructure requirements for water use, including a water balance, for both construction and operational aspects of the Project. Include:
 - Dust suppression;
 - Drinking water;
 - Ablutions and sewage treatment;
 - Processing/ crushing machinery;
 - Transportation of ore and material; and
 - Any other uses.
- Provide information on the proportion of water that will be recycled and if treatment is required, provide details of waste water treatment systems and effluent disposal;
- Describe stormwater drainage systems proposed at the Project site and disposal or re-use arrangements; and
- Identify any seasonal requirements for additional clean water and discharge options for excess contaminated water if applicable.

Energy

- Determine Project energy requirements, including fleet fuels and electricity demand;
- Provide details of proposed power plant (including type of equipment, output, fuel use); and
- Provide details of energy infrastructure requirements, both on and off the site, including fuel storage.

Waste management

Discuss all construction and operational aspects relating to the management and disposal of waste, including:

- Predicted waste streams, both industrial and domestic, including solid wastes at the mine site, accommodation and other relevant locations;
- Waste generation and/or by-products and their storage and disposal;
- Methods for disposing of waste rock, tailings and any other residues; and
- Provide an inventory of any hazardous wastes requiring management during the Project.

Workforce and accommodation

- Describe the number of people to be employed, skills base required, and likely sources (local, regional, overseas) of workforce during construction, and operational phases;
- Discuss arrangements for transport of workers to and from project areas, including air services required; and
- Specify the number of people to be employed to manage or undertake environmental duties on the site, and minimum requirements for qualifications and experience.

For the proposed mine camp, provide brief information on aspects of the facility such as:

- Proximity of the camp to work sites and mining operations;
- Requirements for food preparation and storage; and
- Whether the premises will be licensed and include alcohol storage facilities.

Ancillary infrastructure

Provide construction and operational information regarding ancillary infrastructure, including, but not limited to:

- Telecommunications;
- Information on potentially hazardous materials to be used or produced and methods for storage, transport, handling, containment, disposal and emergency management of these materials (including fuel);
- Details of the use of existing or any proposed airfields. Include a discussion of any upgrade requirements for existing airfields if relevant; and
- Detail any existing ancillary infrastructure that could be used by the Project.

Closure and rehabilitation

Discuss the various aspects of proposed progressive and final rehabilitation of disturbed areas, including:

- Proposed staging/timing;
- Soil profile reconstruction;
- Final landform design and any voids or landscape depressions to be left at cessation of mining;
- The rehabilitation techniques to be used and the final topographic and drainage morphology;
- The proposed revegetation program, with selection and collection of local native species (e.g. native grasses and other vegetation);
- Other preparations required for successful rehabilitation (seed harvesting, seedling generation, etc.); and
- The current and projected financial situation of the proponent including the ability to allocate sufficient resources to meet all closure, stabilisation and rehabilitation requirements once operations have ceased.

Describe mine closure plans including:

- Removal of plant, equipment, structures, hardstand and concrete footings, buildings, water storages, and methods proposed for stabilisation of affected areas;
- Reinstatement of creeks where diversion of creeks is proposed during operations; and
- Future land tenure arrangements.

3.3 Alternatives

The EIS should describe any feasible alternatives to carrying out the proposed activity. The choice of the preferred option(s) should be clearly explained, including how it complies with the principles and objectives of ecologically sustainable development. Alternatives should include:

- Not proceeding with the Project;
- Options for concentrate transport and export;
- Site selection for mine components;
- Mining methods and management of wastes;
- Rehabilitation methods;
- Alternative sources of water;
- Energy sources for power generation;

- Alternative processes, methods and lifecycle; and
- Consideration of alternative environmental management measures for key risks/impacts.

Discussion should include:

- Adverse and beneficial effects of alternatives at national, territory, regional and local levels;
- The comparison of short (whilst operational), medium (post closure) and long term advantages and disadvantages of the alternatives; and
- A comparative description of the impacts of each alternative on the NES matters protected by controlling provisions of Part 3 of the EPBC Act for the action.

It is recommended the Proponent refer to flowchart 3.1 in the Guidebook for Evaluating Mining Projects (ELAW, 2010) (<http://www.elaw.org/mining-eia-guidebook>) to ensure the alternatives section in the EIS is adequate to assess whether the preferred alternatives are the least environmentally damaging practical alternatives.

4 Risk Assessment

4.1 Risk Assessment Approach

The EIS should be undertaken with specific emphasis on the identification, analysis and treatment of risks through a whole-of-project risk assessment. Through this process, the EIS will:

- Acknowledge and discuss the full range of risks presented by the Project, including those of special concern to the public;
- Quantify and rank risks so that the reasons for proposed management responses are clear;
- Acknowledge levels of uncertainty about estimates of risk and the effectiveness of risk controls; and
- Explicitly identify those members of the community expected to accept residual risks and their consequences, providing better understanding of equity issues.

Statements about levels of uncertainty should accompany all aspects of the risk assessment. Steps taken to reduce uncertainty or precautions taken to compensate for uncertainty should be identified and their effect/s demonstrated.

Information provided should permit the reader to understand the likelihood of the risk, its potential severity, and any uncertainty about the effectiveness of controls. Levels of uncertainty that preclude robust quantification of risk should be clearly acknowledged.

Risk rankings assigned should be fully justified. Where a risk score associated with the likelihood or consequence of an impact is reduced as a result of proposed mitigation measures, clear justification should be provided for the reduction in score. The adequacy and feasibility of mitigation measures must be demonstrable.

Sufficient quantitative analysis should be provided to indicate whether risks are likely to be acceptable or tolerable. A comparison can be made with similar ventures in Australia and internationally. Assumptions used in the analyses should be explained. Relevant standards, codes and best practice methodologies that minimise risks should be discussed.

The risk assessment should be based on international best practice. Processes for risk management are formalised in Standards Australia / Standards New Zealand (e.g. AS/NZS ISO 31000:2009; HB 436:2004; HB 158:2010; HB 203:2012).

A number of key Project risks have been identified through a preliminary assessment of the Project. Each of the identified risks should be addressed by the Proponent in the risk assessment and management process.

Additionally, it is expected that further risks will be identified through the comprehensive risk assessment process required for the EIS. These should also be addressed and appropriate management initiatives developed.

Environmental objectives, or overarching goals identifying environmental values to be protected, have been identified for each key risk.

4.2 Socio-economic risks

Key Risks

Operations associated with the life of the Project and increased human activities in the Project area have the potential to change the social demographic, culture and economies. Assessment and monitoring is required to ensure that the local community benefits from the Project, and that the risks of the Project not realising its projected economic and social benefits have been adequately considered.

Objectives

To analyse, monitor and manage the intended and unintended social consequences, both positive and negative, of the Project and any social change processes.

Information Requirements

The EIS should include a balanced summary of the Project's economic value (positive and negative) to the regional, state and national economies, in terms of direct and indirect effects on employment, income and production. The following are suggestions that may assist with highlighting the economic value of the Project and are not intended to result in the inappropriate disclosure of confidential information. It should be noted in the EIS if data are not available or unsuitable. Aspects to be covered include:

- The Project's contribution to the Northern Territory and Australian economy;
- Estimated total Project revenue for the duration of the Project (to provide the economic scale of the Project);
- Total contribution to Gross State Product (GSP) and Gross Domestic Product (GDP) over the economic life of the Project;
- A summary of project feasibility;
- Opportunities available to regional centres based on the activity generated by the Project (construction, rehabilitation and operation);
- Estimated overall tax;
- Estimated capital expenditure for the whole Project;
- Expected annual operational expenditure;
- Estimated workforce and contractor numbers by occupational classification;
- Overall employment training proposed during commencement, construction and operations;
- Planned Indigenous employment, training and other Project participation;
- Expected level of overseas recruitment (if appropriate);
- Availability of goods and services;
- Community and economic value of any residual infrastructure, such as roads, following the life of the Project; and
- Other contributions to local communities, including traditional owners.

The EIS should include a balanced summary of the Project's social value (positive and negative) on a regional, state and national scale. A brief description of the current population, demography and social aspects of the region affected by the Project should be provided in the EIS. This should be done through community consultation, historic research and field survey. No information of a confidential nature, particularly related to anthropological matters relevant to Indigenous people or groups is to be disclosed in the EIS.

Existing social aspects, and their components, to be discussed must include:

- Key stakeholders;
- Regional community structures and vitality (e.g. demography, health, education and social well being, access to services, housing);
- The number and capacity of existing human services to support the construction work force:
 - Skills audit of affected communities;
 - Workforce characteristics; and
 - Accommodation type and quantity.
- Social amenity.

Assessment of risk

An Economic and Social Impact Assessment (ESIA) should be conducted which gives consideration to the potential benefits and costs of the Project. The ESIA should include consideration of the following:

- Estimates of the quantity and value of production/exports relating to the mine, including expected reduction in revenue should the proposal not proceed;
- An estimate of the value of the Project to the local economy. In particular, the value associated with expenditure during the construction phase and the annual expenditure on regional goods and services as it relates to the mine and associated infrastructure; and
- Benefits to local communities, during and beyond the life of the mine, such as development of new skills and facilities, economic development and opportunities for local and regional business and employment opportunities; and
- Negative impacts to local communities during and beyond the life of the mine.

Mitigation and Monitoring

A Social Impact Management Plan (SIMP) should be prepared to address any identified risks associated with the ESIA. At a minimum, the SIMP should include:

- Any stakeholder engagement strategies that have occurred and will continue throughout the life of the Project;
- Prioritisation of potential economic and social impacts predicted in the ESIA;
- Mitigation and management strategies for the identified risks including a register of agreed activities and commitments;
- Establish a mechanism for monitoring any identified potential socio-economic and cultural impacts. The mechanism should also have opportunities for review;
- Mechanisms to resolve new and emerging issues as they transpire and amend the SIMP; and

- Outcome and threshold criteria that will give early warning that management and mitigation measures are failing.

4.3 Risks to Historic and Cultural Heritage

Key Risks

- Construction of the Project has the potential to damage areas or items which have historic and/or cultural heritage values;
- The design of the Project could potentially degrade the aesthetic values of local sites and places which have heritage values;
- Indirect impact to heritage items due to vibration from construction works; and
- Operations associated with the life of the Project and increased human activities in the vicinity have the potential to disturb or damage areas of historic and/or cultural heritage.

Environmental Objective

To identify, understand and mitigate the potential impacts of the project on items or places which have historic and/or cultural heritage values and are protected under the *Heritage Act* and/or *Aboriginal Sacred Sites Act*.

Information Requirements

The EIS should provide information on the significance of any sites within the vicinity of the Project which are protected under the *Heritage Act* and/or the *Aboriginal Sacred Sites Act* and are at risk of being impacted. Information should be provided which outlines the cultural and/or heritage significance of each item identified during any archaeological investigations. The EIS should outline whether those sites or items are protected under relevant Territory and/or National legislation. The information in the EIS should include the results of searches on the Northern Territory Government database. The results of any archaeological investigations should be provided in the EIS as an appendix.

The EIS should provide a summary outlining the survey effort and level of confidence that all items of heritage or cultural significance at risk have been identified.

Assessment of risk

The identification of any impacts to Indigenous cultural heritage is to take place in consultation with relevant Indigenous groups. Provide:

- Details of any requirements to apply to, or applications already made to, the NT Minister for Lands, Planning and the Environment to disturb or destroy a prescribed archaeological place and/or object under the *Heritage Act*;
- Provision of evidence of an Aboriginal Areas Protection Authority (AAPA) Certificate under the *Aboriginal Sacred Sites Act*.

Mitigation

The EIS should outline the prevention and mitigation of risks to sites or items of historic and cultural heritage in a Cultural Heritage Management Plan. The plan should include:

- Procedures to avoid significant areas and sites;
- Protection of key sites during construction, operation and decommissioning work;
- Ongoing protection measures;

- Procedures for the discovery of surface or sub-surface materials during the course of the Project; and
- Measures to enable the Proponent to meet its duty of care to protect the cultural and heritage values of any places or items of significance.

When preparing the archaeological report and the Cultural Heritage Management Plan it is strongly recommended that the Proponent give consideration to, and refer to the Burra Charter and guideline (<http://australia.icomos.org/publications/charters/>) to ensure that the investigations and mitigation measures proposed meet best practice standards for the management of cultural heritage in Australia.

Monitoring

To determine the effectiveness of mitigation measures, the Cultural Heritage Management Plan should include details of a monitoring and reporting program which is to be implemented throughout the life of the project. The monitoring and reporting program should identify when further action is required and outline contingency measures should the proposed mitigation measures result in ongoing degradation to the values of items with heritage significance.

4.4 Risks to Biodiversity

Key risks

- That the Project will result in the following significant impacts to species listed as threatened under the EPBC Act and/or TPWC Act:
 - The Project may lead to a long-term decrease in the size of an important population of a listed threatened species;
 - The Project may fragment an existing important population into two or more populations; and
 - The Project may modify, destroy, remove or isolate the availability or quality of habitat to the extent that a threatened species is likely to decline.
- Degradation of the environment could occur through the introduction and spread of weeds and pest fauna species within and adjacent to the Project area; and
- The potential risks to local biodiversity through the clearing of vegetation, edge effects, introduction of pest animals and weeds and fragmentation of habitat.

Environmental Objectives

To maintain the conservation status, diversity, geographic distribution and productivity of flora and fauna at species and ecosystem levels through the avoidance or management of adverse impacts.

Information Requirements

The following information should be included in the EIS in relation to the Project's risk to biodiversity:

- The results of surveys for species listed as threatened under the EPBC Act and TPWC Act in the proposed action area and surrounding areas. The surveys should also outline the survey effort, timing, location and methodology and be consistent with current Northern Territory or Australian Government guidelines; and
- The EIS should outline the proposed Project footprint overlain with vegetation mapping within the Project area. The vegetation mapping should be sufficient to identify areas which have already been subject to clearing activities or disturbance previously (if any) and identify areas of vegetation which are proposed for clearing.

Assessment of risk

- When assessing the risk of impact to biodiversity, the EIS should refer to relevant research as well as relevant statutory plans including: action plans, recovery plans and threat abatement plans. The EIS should outline the following information:
- A detailed assessment of the presence and potential impacts upon native fauna including consideration, where relevant, of vegetation clearance, habitat fragmentation, altered hydrology, water quality impacts, erosion and sedimentation impacting on waterways, soil compaction, inappropriate/ineffective rehabilitation, groundwater contamination, impacts on surface and groundwater systems, waste material, risks associated with transport and traffic during construction and operation, weed and pest invasion, dust and noise impacts. Species assessed must include, but not be limited to:
 - Crest-tailed Mulgara (*Dasyercus cristicauda*);
 - Brush-tailed Mulgara (*Dasyercus blythi*);
 - Greater Bilby (*Macrotis lagotis*); and
 - Great Desert Skink (*Liopholis kintorei*).
- Discuss the potential impact to vegetation at a local and regional scale, including the potential for ongoing indirect impacts as a result of edge effects, weed incursion or other processes exacerbated as a result of clearing activities;
- Identify and discuss the potential for the Project to introduce or increase the spread of weed species declared under the *Weeds Management Act* onto or throughout the site. Information on the records of weeds should be sourced from the Weeds Branch of the Department of Lands and Resource Management.

Mitigation

- The EIS should contain a detailed Biodiversity Management Plan which outlines clear and concise methods to mitigate likely impacts to biodiversity. All mitigation and monitoring measures should be in accordance with best practice advice from relevant Northern Territory and Australian Government advisory agencies and focus on:
 - Potentially significant impacts to biodiversity as a whole;
 - The proponent's control and mitigation measures under the *Weeds Management Act*; and
 - Potentially significantly impacted vegetation types, rare or threatened species.
- The following information should be provided for EPBC Act listed species:
 - A description of proposed safeguards and mitigation measures to deal with relevant impacts of the action; and
 - Any statutory or policy basis for the mitigation measures.

Monitoring

The Biodiversity Management Plan should include details of a Fauna and Flora Monitoring Program which is designed to monitor the effectiveness of the mitigation measures proposed. The Flora and Fauna Monitoring Program should identify the methodology for monitoring the impacts to biodiversity and identify clear thresholds and contingency measures which will be implemented in the event that the mitigation measures appear ineffective.

4.5 Risks to hydrology and surface water quality

Key Risk

- Surface water quality may be impacted by spills to surface water and runoff containing hazardous substances or elevated sediment concentrations; and
- Contamination of groundwater could occur through the incorrect storage and handling of contaminants, chemicals and toxicants.

Environmental Objective

To ensure that surface water and groundwater resources and quality are protected both now and in the future, such that ecological health and land uses, and the health, welfare and amenity of people are maintained.

Information requirements

- Provide a detailed description of site and regional surface water catchments, including springs, in the vicinity of the proposed Project area and along access roads;
- Discuss the sensitivity and significance of site and regional surface water resources from an ecological, public/social and economic perspective, including a description of water quality and flows, and any existing surface water users;
- Provide a description of site and regional groundwater aquifer resources, quality and significance in the vicinity of the proposed mining areas and their connectivity with surface waters;
- Describe site (and, if relevant, regional) hydrogeology to enable the prediction of potential impacts of the proposal on flora and fauna adjacent to mining areas, including drawdown cones and pollution pathways; and
- Indicate the location of groundwater bores for the Project with respect to any groundwater dependent natural features.

Assessment of risk

Provide an assessment of the risk to surface and groundwater resources in the vicinity of the site and regionally as a result of Project activities. In particular identify and assess risks associated with:

- The area affected by drawdown in relation to other groundwater users, groundwater dependent ecosystems and areas of natural discharge;
- The potential impacts of constructing any infrastructure adjacent to or within waterways. The discussion should outline the potential for erosion, sedimentation and changes to hydrology;
- The potential impacts to surface water and groundwater systems in the event of an accidental spill of contaminants or hydrocarbons;
- The potential for impacts to livestock through the exposure of animals to salt and other contaminants and pollutants associated with mining and/or waste storage activities; and
- The potential for ongoing land degradation and impacts associated with the management and disposal of brine, sulphates, wastewater or other contaminants.

The Proponent should acknowledge that surface and groundwater extraction licences under the *Water Act* are likely to be required. Information on the location of bores (if groundwater is to be used) or river pumps (if surface water is to be used) and monthly water extraction rates at each of these locations will be required in order to assess the water extraction licence applications from a water availability perspective.

Mitigation

To mitigate likely impacts of the action on groundwater and surface water resources, the EIS should contain a detailed Water Management Plan which outlines clear and concise mitigation measures. The purpose of the plan is to maintain and protect both the quality and quantity of ground and surface water resources. All mitigation and monitoring measures in the Water Management Plan should be consistent with best practice advice from relevant Northern Territory and Australian Government advisory agencies. The Water Management Plan must include but not be limited to measures that:

- Avoid contamination of surface or groundwater resources;
- Ensure the protection and resilience of water dependent ecosystems;
- Protect and monitor water quality and levels for existing users of bores and/or surface waters;
- Avoid the exposure of livestock to salt or other chemical substances which may be harmful; and
- Treat and manage domestic wastewater and sewage.

The Water Management Plan should also include a detailed Erosion and Sediment Control Plan (ESCP) which has been prepared by a suitably qualified professional. It is recommended that the ESCP be prepared consistent with ICEA's Best Practice Erosion and Sediment Control Guidelines 2008 (www.austieca.com.au) and outline the proposed control and maintenance measures for both construction and operational phases of the project. The ESCP should include maps and diagrams which display where control measures are proposed to be installed.

Monitoring

To determine the effectiveness of the mitigation measures, the Water Management Plan should outline details of a monitoring program which is to be implemented throughout the life of the Project. The monitoring program should identify clear thresholds and contingency measures should operational activities affect water quality on the site.

4.6 Rehabilitation and Mine Closure

Key Risks

- Following closure and rehabilitation, the mine continues to negatively impact the environment and/or associated communities; and
- The social and economic risk that the Project will create an ongoing environmental legacy if operations are required to cease ahead of schedule due to unforeseen circumstances.

Environmental Objectives

The EIS should include a detailed assessment of the risks to demonstrate that:

- As far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values; and
- The prevention and mitigation of risks associated with closure and rehabilitation of the underground mine and the potential impact on the closure of the existing operation is adequately addressed.

Information Requirements

- Outline final rehabilitation, revegetation and closure plans for all aspects of the Project on completion of mining on site;
- Based upon consultation with Traditional Owner groups of the area, rehabilitation and closure plans must incorporate recognition and consideration of traditional Aboriginal

knowledge, cultural values, land management systems and significance of particular species;

- Based upon landscape evolution modelling, demonstrate that legacy mine structures will be stable over a geologically relevant period; and
- Describe proposed post-mining land uses which have been identified and agreed upon through consultation with stakeholders.

Assessment of Risk

- Identify and discuss risks associated with final rehabilitation, revegetation and closure of the Project; and
- Demonstrate that identified risks associated with rehabilitation, revegetation and closure from the Project will be avoided, mitigated or otherwise minimised to a low level.

Mitigation

Provide a conceptual, whole-of-site Mine Closure Plan (MCP) referring to the information requirements in the Western Australian Environment Protection Authority and Department of Mines and Petroleum mine closure guidelines: <http://edit.epa.wa.gov.au/EPADocLib/Guidelines-for-preparing-mine-closure-plans-21061.pdf>. The MCP must provide an understanding of the issues that require management at closure and demonstrate that all relevant issues and appropriate management measures have been identified.

Demonstrate that closure will be achieved in line with the industry best practice, including:

- Procedures to facilitate the closure process ahead of schedule in the event that the Project is closed due to unforeseen circumstances;
- Revegetation of the disturbed sites using local native plant species similar in density and abundance to those existing in adjacent areas;
- Stabilisation of erosion to, as far as can reasonably be achieved, a similar level of comparable landforms in surrounding undisturbed areas. Information on the use of bunding and drainage around pits should be included;
- Measures required to prevent contamination of groundwater, including contamination of aquifers;
- Contingencies to make landforms secure and non-polluting in the event of any unexpected or temporary closure;
- Weed management; and
- Fire management.

The EIS should also include details of a Care and Maintenance Plan which is based on the Mine Closure Plan. This Care and Maintenance Plan must include measures which outline how the Proponent will maintain its environmental obligations should the Project be temporarily closed.

Monitoring

Describe the post-mining monitoring and reporting used to evaluate and report on the effectiveness and performance of the mitigation measures and contingency measures in the event that monitoring demonstrates that management measures have not been effective.

4.7 Other Issues

Other environmental impacts should be identified and management strategies proposed, including, but not limited to:

Bushfires

The Proponent should be aware of sections of the *Bushfires Act* and Regulations that apply to the Project and address risk and management of bushfires. The development of the Fire Management Plan should be in consultation with traditional owners, pastoralists and their representative organisations, including the Central Land Council, that have specialist knowledge in fire management.

Noise and Vibration

The potential sensitivity of receptors to noise and vibration and mitigation measures should be discussed in a relevant section of the EIS. The Proponent should also address the impact of noise and vibration resulting from the Project on any sensitive receptors. A Noise Management Plan should outline methods for communicating with, and reducing the impact on residents and communities who may be affected by the project.

Waste Management

Discuss:

- Methods for the storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel);
- Methods for the storage, processing and management of waste product produced through the operation of a reverse osmosis plant on site; and
- Waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste.

Air Quality

The EIS should identify risks from air quality to potential sensitive receptors. The EIS should discuss the risks from dust, odours and particulate matter. The EIS should include air quality baselines, monitoring and mitigation measures. The EIS should also discuss the potential nuisance and human health issues associated with air quality.

The sources and projected quantities of greenhouse gases emitted by the Project should be described, including from land clearing.

5 Environmental Management

Specific safeguards and controls proposed to be employed to minimise or remedy environmental impacts identified in previous sections are to be included in an Environmental Management Plan (EMP) or similar plan.

The EMP should be strategic, describing a framework for environmental management of the Project. However, as much detail as is practicable should be provided to enable adequate assessment of the proposal during the public exhibition phase. Specific management practices and procedures should be included in the EMP, where possible.

The EMP should include:

- The proposed management structure of the operation and its relationship to the environmental management of the site;

- Management targets and objectives for relevant environmental factors, including stochastic events such as flooding and high rainfall events;
- Mitigation and treatment strategies should any Potentially Acid Forming material be encountered;
- The proposed measures to minimise adverse impacts and maximise opportunities, including environmental protection outcomes;
- Performance indicators by which all anticipated and potential impacts can be measured;
- Proposed monitoring programs to allow early detection of adverse impacts;
- Information on how areas of land will be managed should it be changed from existing land uses;
- The EMP needs to address the Project phases (construction, operation, decommission) separately. It must state the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue;
- The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program;
- A summary table listing the undertakings and commitments made in the EIS, including clear timelines for key commitments and performance indicators, with cross-references to the text of the EIS; and
- Provision and timing for periodic reviews of the EMP to incorporate improvements to standards and technology as they occur.

Reference should be made to relevant legislation, guidelines and standards, and proposed arrangements for necessary approvals and permits should be noted. Proposed reporting procedures on the implementation of the plan, independent auditing or self-auditing and reporting of accidents and incidents should be included. The agencies responsible for overseeing implementation of the EMP should be identified.

The EMP would continue to be developed and refined following the conclusion of the assessment process, taking into consideration the proposed timing of development activities, comments on the EIS and incorporating the Environmental Assessment Report recommendations and conclusions.

6 Public Involvement and Consultation

The EIS has an important role in informing the public about the Project. It is essential that the Proponent demonstrate how any public concerns were identified, and will influence the design and delivery of the Project. Public involvement and the role of government organisations should be clearly identified. The outcomes of any surveys, public meetings and liaison with interested groups should be discussed including any changes made to the Project as a result of consultation. Details of any ongoing liaison should be discussed.

7 Government Policy and Guidance Notes

7.1 Environmental Offsets

The Australian Government Environmental Offsets Policy, October 2012 requires residual (after avoidance and mitigation measures have been implemented) significant impacts to be offset, with a focus on direct offsets. The Offsets assessment guide, which accompanies this policy, has been developed to give effect to the policy's requirements, utilising a balance sheet approach to quantify impacts and offsets. It applies where the impacted protected matter is a threatened species or ecological community. These documents are available at:

<http://www.environment.gov.au/epbc/publications/environmental-offsets-policy.html>.

The EIS should provide information on:

- Any identified impacts or detriments that cannot be avoided, reduced or mitigated at reasonable costs and whether these impacts could be considered as ‘significant’ under the EPBC Act;
- Risks of failure of management actions (such as rehabilitation, weed control, etc.) and uncertainties of management efficacy should be identified; and
- Proposed offsets for residual significant impacts to listed threatened species or and an explanation as to how these proposed offsets are consistent with the requirements of the Environmental Offsets Policy and Offsets assessment guide, where relevant.

7.2 Public Health Premises and Food Premises

NT Department of Health will require detailed plans submitted via a building certifier, prior to construction, if shops or accommodation facilities are to be provided on the Project site. Further information from the NT Department of Health are provided in fact sheet 700 - *Requirements for Mining and Construction Projects*.

7.3 Water Supply

All workings of the Project require the provision of an adequate potable water supply. All water supplies collected from groundwater must be at least 100m from any effluent drainage system or other water bodies as described in the *NT Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent (The Code)*.

7.4 Wastewater

NT Department of Health will require a notification to install a waste water treatment system outside of a building control area if a new effluent treatment system is to be installed to treat effluent. Any waste water treatment system(s) installed on-site shall be capable of collecting, treating and disposing of waste water on-site in accordance with the Code. Further information can be found at: www.health.nt.gov.au/Environmental_Health/Wastewater_Management.

7.5 Waste discharge

Any discharge of wastewater from the Project area into groundwater or waterways may require licensing under the NT *Water Act*. Guidance and application forms can be found at: www.ntepa.nt.gov.au.

7.6 Solid waste storage and disposal

Disposal of waste should be conducted in such a way as to avoid potential public health nuisances and environmental pollution.

7.7 Mosquito Breeding

Guidance on preventing the creation of mosquito breeding sites can be found in the Medical Entomology guideline “Guidelines for preventing mosquito breeding sites associated with mining sites in the Northern Territory”. Reference to the Medical Entomology, Department of Health guidance documentation regarding biting insect management is located at: http://health.nt.gov.au/Medical_Entomology/Publications/Development_Guidelines/index.aspx.