Terms of Reference for the proposed Wateranga Project

Environmental Protection Agency
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PREAMBLE

The project

Queensland Industrial Minerals Ltd (QIM) has lodged one Mining Lease Application (ML 80116), known as Wateranga, within MDL 355 located approximately 80 km south-west of Bundaberg in Queensland.

The Wateranga ML is required for the purpose of extracting a variety of industrial minerals including feldspar and ilmenite. The deposit consists of a combination of unconsolidated and hard rock resources, of which the eluvial component is uniformly distributed and is situated at, or near surface. Additional resources external to the boundaries of the proposed MLA will be secured at the appropriate time in the future when the current resources are exhausted. Exploration to date has identified a large resource which, based on current proposed processing rates, will take over 30 years to mine.

The Project comprises the following activities: Pre-clearing/engineering design; clearing; infrastructure construction; mining and processing; transportation; decommissioning; and rehabilitation.

The Project will be affected by the Burnett River Dam (BRD), currently under construction, which will, upon inundation, cover a sizeable portion of the identified resources. Dam construction has commenced and will progressively fill during the wall development. The dam is scheduled for completion and subsequent flooding in November 2005.

The Project's mining operation will extract and process resources located above and below the full supply level (FSL) of the BRD. QIM will extract the identified resources from below the FSL during periods when these areas are not subject to inundation. This opportunistic exploitation of resources below the FSL will be facilitated by the placement of bunds.

Stockpiling of topsoil is not expected to be large as the resource is generally only covered by a thin veneer of overburden. Initial unconsolidated resources will be extracted to a depth in the order of 4.5 metres. Ore will initially be processed through a gravity water separation plant to extract the mineral concentrate, which will then pass through a magnetic separation process to separate the ilmenite and other magnetic minerals from the reject material.

Progressive rehabilitation will be undertaken to ensure minimal disturbance of the site. Stabilisation of the mined areas below the FSL through appropriate rehabilitation techniques will occur prior to allowing water levels to return to the FSL. Upon a return to the FSL, these areas will reach their final land use and will be considered rehabilitated. In other areas above the FSL, dewatered tailings material from the gravity separation process will be directed back into the mined areas. Upon completion of each excavation and backfilling with tailings, topsoil will be spread over the re-contoured pit and sown with a lucerne crop in order to complete the de-watering process. Upon completion of the lucerne crop, an appropriate final vegetation species mix will be sown. Other beneficial and sustainable land uses which may be employed at this site include the development of forestry, vineyards, orchards and grazing.

Aims of the study

This document provides terms of reference (TOR) for the preparation of an Environmental Impact Statement (EIS) for the Project. In preparing the EIS, the proponent should be aware of the following aims of an EIS and the public review process:

- To provide a source of information from which interested individuals and groups may gain an understanding of the Project, the need for the Project, the alternatives, the environment that it would affect, the impacts that may occur and the measures to be taken to minimise these impacts.
- To provide a forum for public consultation and informed comment on the Project.
- To provide a framework in which decision-makers can consider the environmental aspects of the Project in conjunction with economic, social, technical and other factors.

While every attempt has been made to ensure that these TOR address all of the major issues associated with this Project, they are not necessarily exhaustive and should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them or matters (currently unforeseen) that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIS.

These TOR address the major issues associated with the Project, but may be refined during the preparation of the EIS if other pertinent matters arise.

The environmental impact assessment process

The key aspects of the EIS process are outlined below:

- Draft TOR are prepared and public comment is invited over a six-week period.
- The TOR are finalised to ensure that the assessment:
  - assesses the environmental, social and economic impacts that the Project will have or is likely to have; and
  - contains enough information about the Project and its relevant impacts to allow the Environmental Protection Agency (EPA) and other relevant administering authorities to make an informed decision whether or not to proceed with approvals.
- An EIS is prepared by the proponent and made publicly available for a period of at least 20 business days and submissions are invited.
- The proponent:
  - summarises the issues raised in the submissions;
  - addresses the issues raised during the submission period; and
  - prepares a supplementary report.
- The EPA evaluates the EIS and supplementary report and prepares an assessment report. A copy of the report is provided to the proponent.

CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

It is recommended that the EIS follow the heading structure of these TOR to facilitate cross referencing. However, consideration will be given to changes in the EIS structure if appropriate, including separation of identification of potential impacts from mitigation measures.

1.0 Executive summary

The function of the executive summary is to convey the most important aspects and options relating to the project to the reader in a concise and readable form. The structure of the executive summary should follow that of the EIS, although focused strongly on the key issues and conclusions.

1.1 Glossary of terms

A glossary of technical terms and acronyms should be provided.

2.0 Introduction

The function of the introduction is to explain why the EIS has been prepared and what it sets out to achieve. In particular, the introduction should address the level of detail of information required to meet the level of approval

being sought. It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Throughout the EIS, factual information contained in the document should be referenced.

2.1 Project Proponent

Provide details of the project proponents, including details of any joint venture partners.

2.2 Project Description

Provide a brief description of the key elements of the project should be provided and illustrated. Any major associated infrastructure requirements should also be summarised. Detailed descriptions of the project should follow in Section 4.

A brief description should be provided of studies or surveys that have been undertaken for the purposes of developing the project and preparing the EIS. This should include reference to relevant baseline studies or investigations undertaken previously.

2.3 Project Objectives and Scope

Provide a statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, including alternatives, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

Describe the current status of the project and outline the relationship of the project to other developments or actions that may relate whether or not they have been approved. The consequences of not proceeding with the project should also be discussed.

2.4 The Environmental Impact Assessment (EIA) Process

The purpose of this section is to make clear the methodology and objectives of the environmental impact assessment under the relevant legislation.

2.4.1 Methodology of the EIS

The important aspect of this section is to clarify the objectives of the environmental impact assessment process under the *Environmental Protection Act 1994*. This section should include a description of the impact assessment process steps, timing and decisions to be made for relevant stages of the Project.

In particular, this section should outline mechanisms in the process for public input and the public release of an EIS that will specify all responses to stakeholder submissions.

This section should further highlight the necessity for the proponent to undertake wide consultation as part of the impact assessment process. This section ensures that:

- relevant legislation is addressed;
- there is awareness of the process to be followed; and
- stakeholders are aware of any opportunities for input and participation.

2.4.2 Objectives of the EIS

Having described the objectives of the EIA process, a succinct statement should be made of the objectives of the EIS. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. In brief, the purpose of the EIS is to provide public information on the need for and likely effects of the Project, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives is a key aspect of the EIS.

Outline the role and purpose of the EIS. The audience should be able to distinguish the EIS as the key environmental document providing advice to decision-makers considering approvals for the Project. The role of the EIS in providing the mining Project's Environmental Management Overview Strategy (EMOS) for ongoing regulation should also be discussed.

2.4.3 Submissions

The reader should be informed as to how public submissions on the draft EIS will be addressed and taken into account in the decision-making process.

2.5 Public Consultation Process

Development of an appropriate public consultation program, developed to the satisfaction of the EPA, is essential to the impact assessment. This section should outline the methodology that will be adopted to identify and mitigate socio-economic impacts of the project. Information about the consultation that has already taken place and the results of such consultation should be provided.

Section 41 of the *Environmental Protection Act 1994* requires the submission of a list of affected persons and interested persons, as well as information on consultation with interested persons. Consultation should be held with affected and adjacent landowners/landholders and land users to determine road and service access requirements/agreements. Appendices should contain a Consultation Report containing this information.

The public consultation program should include meetings with interest groups and stakeholders including local landowners/landholders, government agencies and Indigenous stakeholders.

The public consultation process should identify broad issues of concern to the local community and interest groups and should continue from Project planning through commissioning, Project operations and final rehabilitation.

Reference should be made to the Department of Natural Resources and Mines (DNRM) *Technical Guideline on Community Consultation 1995* and QEPA *Guideline 7 - Issue Identification and Community Consultation.*

2.6 Project Approvals

2.6.1 Relevant Legislation and Policy Requirements

This section should explain the legislation and policies controlling the approvals process. Reference should be made to the Queensland *Environmental Protection Act 1994, Water Act 2000, Mineral Resources Act 1989* and other relevant Queensland laws. Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* should also be included.

This information is required to assess how the legislation applies to the Project, which agencies have jurisdiction and whether the proposed EIA process is appropriate.

In addition, necessary approvals for the proposed Project should be identified. Consideration of the Project's consistency with the legislation, standards, codes or guidelines available to monitor and control operations on site should be given. Where applicable the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* should be referred to.

2.6.2 Planning Processes and Standards

This section should discuss the project's consistency with existing land uses or long-term policy framework for the area (e.g. as reflected in local and regional plans), and with legislation, standards, codes or guidelines available to monitor and control operations on site. This section should refer to all relevant State and regional planning policies. This information is required to demonstrate how the proposal conforms with State, regional and local plans for the area.

3.0 Project need and alternatives

3.1 Project Justification

The justification for the project should be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the project may provide. The status of the project should be discussed in a regional, State and national context.

3.2 Alternatives to the Project

Describe feasible alternatives, including conceptual and technological alternatives to the proposed Project including discussion of the consequences of not proceeding with the Project, or parts of the project (ie if resources are not exploitable below the FSL). Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Reasons for selecting the preferred options should be delineated in terms of technical, commercial, social and natural environment aspects. Comparative environmental impacts of each alternative should be summarised.

The options and the reason for preferring particular options over others can be discussed in more detail in Sections 3 and 4, particularly if the reasons are on environmental grounds.

Explain the interdependencies of the Project components, particularly in regard to how any infrastructure requirements relate to the viability of the Project. This section should include a description of and rationale for water supply and/or storage infrastructure for the Project.

The relationship of options chosen for waste management and any emissions produced should be detailed.

4.0 Description of the project

The objective of this section is to describe the project through its lifetime of construction and operation and decommissioning. This information is required to allow assessment of all aspects of a proposal including all phases of the proposal from planning, construction and operation through to decommissioning. It also allows further assessment of which approvals may be required and how they may be managed through the life of the proposal.

4.1 Location

4.1.1 Regional Context

The regional and catchment context of the proposal should be described and illustrated on maps at suitable scales.

4.1.2 Local Context

The local context of the proposal should be described and illustrated on maps at suitable scales. Site access points to, from and within the project area should be clearly identified on the aforementioned maps. Real property descriptions of the project site should be provided.

4.2 Construction

The extent and nature of the project's construction phase should be described. The description should include the type and methods of construction, the construction equipment to be used and the items of plant to be transported onto the construction site. Any staging of the proposal (construction) should be described and illustrated showing site boundaries, development sequencing, and timeframes. The estimated numbers of people to be employed in the project construction phase should also be provided with a brief description of where those people may be accommodated.

4.3 Operations

This section should analyse the effectiveness of the mining proposal in achieving the optimum utilisation of the mineral resources within the Project area. It should demonstrate that the mining proposal will best develop the mineral resources within the Project area, minimise resource wastage and avoid any unnecessary sterilisation the State's mineral resources. This section should include maps, description and discussions for any part of the resource not intended to be mined and any part of the resource that may be sterilised by the proposed mining operations or infrastructure.

The location and nature of the processes to be used, including mining, should be illustrated with maps and diagrams, and described in the text. Operational issues to be addressed should include, but may not be limited to:

- a description of plant and equipment to be employed;
- the capacity of plant and equipment, and

- chemicals to be used.

Concept and layout plans should be provided highlighting proposed buildings, structures, plant and equipment associated with the mining operation and processing operation. The nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw materials, should be described. A description of the anticipated timing and/or sequence of resource extraction from above and below the FSL should be included.

Indicative process flow-sheets should be provided showing material balances for the processing plant, and the anticipated rates of inputs, along with similar data on products, wastes and recycle streams.

Summarise the results of studies and surveys undertaken to identify the natural resources required to implement the proposal. The location, volume, tonnage and quality of natural resources required should be described (eg land, water, forests, energy). Maps should be provided showing the precise location of the project area, and in particular:

- the location and boundaries of land tenures, granted or proposed, to which the project area is or will be subject,
- the location and boundaries of mining tenures, granted or proposed, to which the project area is, or will be subject,
- the location and boundaries of proposed staged mining operations, ore stockpile area, product stockpile area, tailings dam, plant site, stormwater dam, FSL, 20 year floodline and 100year floodline,
- the location and boundaries of the project footprint, and
- the location of any proposed buffers surrounding the working areas.

Consideration should be given to providing a rectified air photo enlargement to illustrate components of the project in relation to the natural and built features of the area.

A description should be provided of the quantities and characteristics of the products produced.

Information should be provided on the workforce numbers to be employed in the facility's operations with a brief description of where those people may be accommodated.

4.4 Product handling

Describe and show on plans at an appropriate scale the proposed methods and facilities to be used for product storage and for transferring product from the processing plant to the storage facilities and from the storage facilities to the transport facilities. Include discussion of any environmental design features of these facilities including bunding of storage facilities.

The EIS must state:

- Intended stockpiles including quantities;
- Material stockpiling procedures and management to encompass all material stockpiles;
- Management of unstable stockpiles to prevent slumping or destabilisation;
- Leachate and runoff management at each stockpile; and
- Environmental features that make stockpile sites suitable for material stockpiling.

4.5 Infrastructure requirements

This section should provide descriptions, with concept and layout plans, of requirements for constructing, upgrading or relocating all infrastructure in the vicinity of the project area. The matters to be considered include (but not limited to) such infrastructure as roads, rail, bridges, jetties, ferries, tracks and pathways, dams and weirs, bore fields, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

4.5.1 Transport - Road/Rail/Ship

Describe arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction phase and operational phases of the project. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure.

Provide details of any proposed use of rail for transport of materials, products or wastes to or from the project site. Provide details of proposed use of rail for transport of materials, products or wastes to or from the project site. Rail details (if proposed to be utilised) to be provided should include: train consists (ie. the number of wagons); freight capacity of the wagons; locomotive type; and track characteristics, including constraints, if any. In relation to shipping of products, details of the number of ships and their size should be documented.

Layout plans should show the proposed transport route options, highlighting the state-controlled and local government roads. This plan should also show detail of alternative haul routes through Bundaberg to the port,

Information should be provided on road transportation requirements on public roads for both construction and operations phases, including:

- the volume, composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials, finished products;
- the volume of traffic generated by workforce personnel, visitors and service vehicles;
- method of movement (including vehicle types and number of vehicles likely to be used);
- anticipated times at which movements may occur;
- details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition); and
- the proposed transport routes.

4.5.2 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the proposal. The locations of any easements should be shown on the infrastructure plan. Energy conservation should be briefly described in the context of any Commonwealth, State and local government policies.

4.5.3 Water Supply and Storage

The EIS should provide information on water usage by the project, including the quality and quantity of all water supplied to the site. In particular, the proposed and optional sources of water supply should be described (eg. bores, any surface storages such as dams and weirs, municipal water supply pipelines) as well as the associated authorisations for the taking of any water.

Estimated rates of supply from each source (average and maximum rates) should be given. Any proposed water conservation and management measures should be described.

Determination of potable water demand should be made for the project, including the temporary demands during the construction period. Details should be provided of any existing town water supply to meet such requirements. If water storage and treatment is proposed on site, for use by the site workforce, then this should be described.

4.5.4 Stormwater Drainage

A description should be provided of the proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services.

4.5.5 Sewerage

Provide volume estimates of industrial and domestic effluent that will be produced and the proposed method of disposal. This should include the physical and chemical characteristics of such effluent.

If discharging into an existing sewerage system, an assessment of the capacity of the existing system to accept the effluent should be provided.

If onsite sewage treatment system proposed details provided should include:

- a description of the treatment process with a process flow sheet showing waste streams and the method of waste disposal;
- the capacity of the treatment and disposal system; and
- a location plan which shows proposed discharge points.

The EIS should include the following:

- Assessment of the receiving environment and its ability to receive effluent;
- Quantity and quality of effluent produced;
- Management of sewage treatment plant to ensure compliance with design specifications;
- Sustainability of effluent disposal;
- Maintenance requirements of the STP; and
- Assessment of potential surface water and / or groundwater contamination and mitigation measures (which will be undertaken in accordance with assessments of surface and groundwater for the site).

4.5.6 Telecommunications

The EIS should describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

4.5.7 Accommodation and Other Infrastructure

A description should be provided of any other developments directly related to the project not described in other sections, such as:

- camps, townships or residential developments;
- fuel storage areas;
- equipment hardstand and maintenance areas; and
- technical workshops and laboratories.

4.6 Waste Management

4.6.1 Character and Quantities of Waste Materials

Provide an inventory of all wastes generated by the proposed operation during construction and operational phases of the project. In addition to the expected total volumes of each waste produced, include an inventory of the following per unit volume of product produced:

- the tonnage of products processed;
- the amount of resulting process wastes; and
- the volume and tonnage of any by-products.

Schematic diagrams should be provided for each distinct stage of the project (e.g. construction/site preparation, operation and decommissioning) indicating the processes to be used and highlighting their associated waste streams (i.e. all waste outputs: solid, liquid and gaseous), including recycling efforts, such as stockpiling and reusing topsoil. The schematic diagrams, or an associated table, should cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described. The physical and chemical characteristics of waste material from the process plant should be provided.

In regards to tailings produced from the operation, consideration should be given to the following aspects:

- volumes of tailings to be generated;

- capacity of tailings dams and ability to cope during flood events;
- method of storage and design criteria;
- description of tailings characteristics and chemistry and reference to any potential impacts on water quality; and
- long term management of tailings.

Having regard for best practice waste management strategies and the *Environmental Protection (Waste) Policy 2000*, the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described. Information should also be provided on the composition and generation rates of all waste generated at the site and processing plant.

4.6.1.1 Air Emissions

Describe in detail the quantity and quality of all air emissions (including particulates, fumes and odours) from the project during construction and operation

The methods to be employed in the mitigation of impacts from air emissions should be described in section 4.5.

4.6.1.2 Solid Waste Disposal

The proposed location, site suitability, dimensions and volume of any landfill, including its method of construction, should be shown.

4.6.1.3 Wastewater

A description should be presented of the origin, quality and quantity of wastewater originating from the project. Particular attention should be given to the capacity of wastes to generate acid, and saline or sodic waste water. A water balance for the proposal and processing plant is required to account for the estimated usage of water.

The EIS may need to consider the following effects:

- groundwater from excavations;
- rainfall directly onto disturbed surface areas;
- run-off from roads, plant and industrial areas, chemical storage areas;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from other waste storages;
- water usage for:
    - process use,
    - dust suppression, and
    - domestic purposes.
- evaporation;
- domestic sewage treatment - disposal of liquid effluent and sludge; and
- water supply treatment plant - disposal of wastes.

4.7 Financial feasibility

This section shall detail the financial feasibility of the proposal, including details of costs of development and ongoing maintenance, operational and decommissioning costs; the cost of project impacts on state infrastructure; the capacity of the proponents to satisfactorily develop the project; the costs of decommissioning the project and rehabilitation of the site, cash-flow projections; applicable commercial and Government fees; financial assurances and Joint Venture arrangements; and Foreign Investment Review Board issues.

This part of the EIS may be confidential.

4.8 Rehabilitation and decommissioning

This section should present the strategies and methods for progressive and final rehabilitation of the environment disturbed by the proposal. Rehabilitation strategies and methods will need to be described for areas subject to mining from above, and also below, the FSL.

The proposed final landform design of any excavations, waste areas and dam sites that is consistent with landform stability and sustainable land use options should be shown. The land use suitability and sustainable land use options which are likely to be consistent with community expectations at the end of mine life for the various land disturbance types should be described.

The means of decommissioning the proposal, in terms of the removal of plant, equipment, structures and buildings should be described, and the methods proposed for the stabilisation of the affected areas should be given. Final rehabilitation of the site should be discussed in terms of achieving the following for the various land disturbance types:

- Land form stability;
- Self sustaining vegetation covers in the context of proposed ecosystem objectives;
- Ongoing land use suitability and sustainable post mining land use; and
- Management of any residual contaminated land and any other land management issues.

Consideration will need to be given to the compatibility of complementary industries to the values of the landowners/landholders, and also to the environmental values of the area.

Rehabilitation will take into account landowners/landholders requirements (eg Burnett Water Pty Ltd Vegetation Community Management).

The rate of rehabilitation will be stated in the EIS, describing how the rate of rehabilitation will suitably meet the needs of the landowners/landholders and how the rate of rehabilitation will maintain the environmental values of the area, including the ongoing maintenance of rehabilitation works during the life of the mining operation.

5.0 Environmental values and management of impacts

The functions of this section are:

- To describe the existing environmental values of the area which may be affected by the proposal. Environmental values are defined by the *Environmental Protection Act 1994* and environmental protection policies. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS;
- To describe the potential adverse and beneficial impacts of the proposal on the identified environmental values. Any likely environmental harm on the environmental values should be described. Include analysis of any cumulative impacts on environmental values caused by the proposal;
- To present environmental protection objectives and the standards and measurable indicators to be achieved; and
- To examine viable alternative strategies for managing impacts. These alternatives should be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed. This section should detail the environmental protection measures incorporated in the planning, construction, operations, decommissioning, rehabilitation and associated works for the proposal. Measures should minimise environmental harm and maximise socio-economic and environmental benefits of the proposal. Preferred measures should be identified and described in more detail than alternatives.
- Environmental protection objectives may be derived from legislative and planning requirements which apply to the proposal including Commonwealth strategies, State planning policies, local authority strategic plans, environmental protection policies under the *Environmental Protection Act 1994*, and any catchment management plans prepared by local water boards or land care groups. Special attention should be given to those mitigation strategies designed to protect the values of any sensitive areas and any identified ecosystems of high conservation value within the area of possible proposal impact.

This section should address all elements of the environment, (such as land, water, coast, air, waste, noise, nature conservation, cultural heritage, social and community, health and safety, economy, hazards and risk) in a way that is comprehensive and clear. To achieve this, the following issues should be considered for each environmental value relevant to the project:

- Environmental values affected: describe the existing environmental values of the area to be affected including values and areas that may be affected by any cumulative impacts (refer to any background studies in Appendices - note such studies may be required over several seasons).
- Impact on environmental values: describe quantitatively the likely impact of the proposal on the identified environmental values of the area. The cumulative impacts of the proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. In particular, any requirements of relevant State planning policies, environmental protection policies, national environmental protection measures and integrated catchment management plans should be addressed.

  Cumulative impacts on the environmental values of land, air and water and cumulative impacts on public health and the health of terrestrial, and aquatic ecosystems must be discussed in the relevant sections. This assessment may include air and water sheds affected by the proposal and other proposals competing for use of the local air and water sheds.

  Consultative arrangements with other industries in the project area to undertake cooperative monitoring and/or management of environmental parameters are recommended.
- Environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objective as well as the numerical standard that defines the achievement of the objective (this standard must be auditable). The measurable indicators and standards can be determined from legislation, support policies and government policies as well as the expected performance of control strategies. Objectives for progressive and final rehabilitation and management of contaminated land should be included.
- Control strategies to achieve the objectives: describe the control principals, proposed actions and technologies to be implemented that are likely to achieve the environmental protection objectives; include designs, relevant performance specifications of plant. Details are required to show that the expected performance is achievable and realistic.
- Monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals.
- Auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed. Include scope, methods and frequency of auditing proposed.
- Management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented eg. continuous improvement framework including details of corrective action options, reporting (including any public reporting), monitoring, staff training, management responsibility pathway, and any environmental management systems and how they are relevant to each element of the environment.
- Information quality: information given under each element should also state the sources of the information, how recent the information is, how any background studies were undertaken (e.g. intensity of field work sampling), how the reliability of the information was tested, and what uncertainties (if any) are in the information.

It is recommended that the final ToR and the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the environmental monitoring program for the project (see section 6).

5.1 Land

5.1.1 Description of Environmental Values

This section describes the existing environment values of the land area that may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection Policies*. It should also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

5.1.1.1 Topography/Geomorphology

Maps should be provided locating the project and its environs in both regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD). Significant features of the landscape should be included on the maps. Describe the site in relation to the catchment systems and any waterways on or near the site.

5.1.1.2 Geology, resources and reserves

The EIS should provide a description and map of the geology of the proposal area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Geological properties that may influence ground stability (including seismic activity, if relevant), occupational health and safety, rehabilitation programs, or the quality of wastewater leaving any area disturbed by the proposal should be described.

The EIS should provide details of the resources and ore reserves in the project area. The EIS should also provide details of the resources and ore reserves in the project area that fall below the FSL of the BRD.

5.1.1.3 Soils

A soil survey of the sites affected by the proposal should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials, which will influence erosion potential, storm water run-off quality and site stability. Information should also be provided on soil stability and suitability for construction of proposed facilities.

Soil profiles should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) and Australian Soil Classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the Planning Guidelines: the Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993), and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

5.1.1.4 Land Use

The EIS should provide a description of current land tenures, land suitability classes and land uses, including native title issues, in the proposal area, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims should be shown.

Maps at suitable scales showing existing land suitability classes, land uses and tenures, and the proposal location, should be provided for the entire proposal area and surrounding land that could be affected by the development. The maps should identify areas of conservation value in any locality that may be impacted by the proposal. The location of existing dwellings and the zoning of all affected lands according to any existing town or strategic plan should be included.

The proximity to the Goodnight Scrub National Park will be identified.

Describe the land use suitability classes of the affected area in terms of limiting criteria and the physical and economic attributes. The potential environmental harm caused by the proposal on the adjacent areas currently used for agriculture, urban development, recreation, tourism, other business and the implications of the proposal for future developments in the impact area including constraints on surrounding land uses should be described.

Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses, e.g. for grazing of native and improved pastures and horticulture. Land classified as Good Quality Agricultural Land in the DNRM land classification system is to be shown.

5.1.1.5 Infrastructure

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, covering the affected land should be shown. Indicate locations of gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this infrastructure.

5.1.1.6 Sensitive environmental areas

The EIS should identify whether areas that are environmentally sensitive could be affected, directly and indirectly, by the proposal. Areas sensitive to environmental harm caused by the proposal can be determined through site-specific environmental impact assessment.

In particular, the EIS should indicate if the land affected by the proposal is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should be given to national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA), areas of cultural significance and scientific reserves (see section 4.7 for further guidance on sensitive areas). Identify the proximity of the proposal elements to any of these areas.

5.1.1.7 Scenic values

The visual impact, in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation (ie BRD), from road, cycle and walkways, from the air and other known vantage points day and night, during all stages of the project as it relates to the surrounding landscape is to be analysed and discussed. The assessment is to address the local and broader visual impacts of the project structures and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos should be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations.

Special consideration is to be given to public roads, public thoroughfares, recreational areas (ie National Park) and places of residence or work, which are within the line-of-sight of the project.

5.1.1.7.1 Lighting

An assessment of all potential impacts of lighting of the project, during all stages, is to be provided, with particular reference to:

- the visual impact at night;
- night operations/maintenance and effects of lighting on fauna, flora and residents;
- the potential impact of increased vehicular traffic; and
- changed habitat conditions for nocturnal fauna and associated impacts.

5.1.1.7.2 Landscape character

All impacts of the project on the visual quality and landscape character of the site and the surrounding area are to be considered on both the broad and local level. Particular reference is to be made to the following:

- impacts on existing land use that contribute to the character of the local area;
- potential impacts to scenic amenity of any conservation (eg National Park); and
- the visual absorption capacity of the site - the ability to absorb the impact of the proposed development.

Appropriate simulation to portray broad and near views and impacts of the project on visually sensitive areas, including the extent of the significance of the skyline as viewed from known vantage points, is to be included.

The EIS should detail the scenic or landscape values of the area.

5.1.1.7.3 Visual amenity

Appropriate simulation to portray broad and near views and impacts of the project on visually sensitive areas, including the extent of the significance of the skyline as viewed from known vantage points, should be included.

An assessment should be made of the existing visual quality/landscape character of the project site and the surrounding area and its prominence including local, regional, Statewide, national and international significance. Information in the form of maps, sections, elevations and photographs is to be utilised, particularly addressing the following:

- identification of elements within the proposal and surrounding area that contribute to their image of the town/city as discussed in any local government strategic plan - city image and townscape objectives and associated maps;
- major views, view sheds, existing viewing outlooks, ridgelines and other features contributing to the amenity of the area, including assessment from private residences in the affected area along the route;
- focal points, landmarks (built form or topography), gateways associated with project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area and the project site;
- character of the local and surrounding areas including character of built form (scale, form, materials and colours) and vegetation (natural and cultural vegetation) directional signage and land use;
- identification of the areas of the proposal that have the capacity to absorb land use changes without detriment to the existing visual quality and landscape character; and
- the value of existing vegetation as a visual screen.

5.1.2 Potential Impacts and Mitigation Measures

5.1.2.1 Land Use Suitability and sustainable land use

The potential for the construction and operation of the proposal to change existing and potential land uses of the proposal site and adjacent areas should be detailed. Post operations sustainable land use options should be detailed including suitability of the area to be used for agriculture, industry, or nature conservation. The factors favouring or limiting the establishment of those options should be given in the context of land use capability or suitability prior to the proposal and minimising potential liabilities for long-term management.

If the development adjoins or potentially impacts on good quality agricultural land, then an assessment of the potential for land use conflict is required. Investigations should follow the procedures set out in the Planning Guidelines: Separating Agricultural and Residential Land Uses (DNR, DLGP, 1997).

Assessment of potential impacts on the adjacent National Park will be undertaken.

Outline incompatible land uses, whether existing or potential, adjacent to all aspects of the project, including essential and proposed ancillary developments or activities and areas directly or indirectly affected by the construction and operation of these activities should be identified and measures to avoid unacceptable impacts defined.

Changes in the fertility of disturbed areas, particularly as it may affect the suitability of the post mining landform to sustain vegetative cover, should be described.

5.1.2.2 Land Disturbance

A strategy should be developed with a view to minimising the amount of land disturbed at any one time. The strategic approach to progressive and final decommissioning should be described.

The methods to be used for the proposal for achieving:

- land form stability (geotechnical and hydrological);
- self sustaining vegetation covers for the chosen ecosystem (including performance measures); and

- sustainable post mining land use for each disturbance type, including backfilling, covering, re-contouring, topsoil handling and revegetation should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

Proposals should be provided to divert creeks during construction or operations, and, if applicable, for the reinstatement of the creeks. Where dams and roads and other infrastructure are to be constructed, proposals for the management of these structures after the completion of the proposal should be given. A contour map of the area should be provided (if relevant). Also, the final drainage and seepage control systems and any long-term monitoring plans should be described.

Proposed decommissioning should be described in detail, including consolidation, revegetation, fencing, and monitoring.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The minimisation of topsoil storage times (to reduce fertility and seed viability degradation) should also be addressed. Erosion and sediment control should be described (also see section 5.1.2.4).

Information should be provided regarding decommissioning of any plant site, removal of processing plant, rehabilitation of concrete footings and foundations, hard stand areas, storage tanks and wharfage (including any potential for reuse of these facilities).

5.1.2.3 Land Contamination

The EIS should describe the possible contamination of land from aspects of the proposal including waste, reject product, and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the *Environmental Protection Act 1994*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land, processing plant site and product storage areas after proposal completion.

A Preliminary Site Investigation (PSI) of the site consistent with the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (Refer to References section – Queensland EPA, 1998) should be undertaken to determine background contamination levels. The results of the PSI should be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a detailed site investigation progressively managed in accordance with the stages outlined in Appendix 5 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* should be undertaken.

In short, the following information may be required in the EIS:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the *Environmental Protection Act 1994*;
- identification of any potentially contaminated sites not on the registers which may need remediation; and
- a description of the nature and extent of contamination at each site and a remediation plan and validation sampling.

The EIS should address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from project activities.

5.1.2.4 Soil Erosion

For all permanent and temporary landforms, possible erosion rates and management techniques should be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques should be outlined. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also be outlined. Mitigation strategies should be developed to achieve acceptable soil loss rates, levels of sediment in rainfall runoff and wind-generated dust concentrations.

The report should include an assessment of likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas such as:

- the plant site, including buildings;
- access roads or other transport corridors;
- any waste dumps; and
- dams, banks and creek crossings.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to (a) preventing soil loss in order to maintain land capability/suitability, and (b) preventing significant degradation of local waterways by suspended solids.

5.1.2.5 Scenic Values

Scenic values should be managed as follows. List all management options to be implemented and how these will mitigate or avoid the identified impacts.

5.1.2.5.1 Lighting

Management of the lighting of the project, during all stages, is to be provided, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid:

- the visual impact at night;
- night operations/maintenance and effects of lighting on fauna and residents;
- the potential impact of increased vehicular traffic; and
- changed habitat conditions for nocturnal fauna and associated impacts.

5.1.2.5.2 Landscape Character

Describe how the impacts of the project on the visual quality and landscape character of the site and the surrounding area are to be mitigated or avoided. Particular reference should be made to the following:

- impacts on existing land use that contribute to the character of the local area;
- potential impacts to scenic amenity of any conservation area (e.g. national park); and
- the visual absorption capacity of the site - its ability to absorb the impact of the proposed development.

5.1.2.5.3 Visual Amenity

An outline of the resulting visual quality/landscape character of the project site and the surrounding area and its prominence including local, regional, statewide, national and international significance. Information in the form of maps, sections, elevations and photographs is to be utilised. Detail the impact on visual amenity and the intended proposal design to achieve the visual character specified.

5.1.2.6 Transport

The EIS should provide sufficient information to make an independent assessment of how the State-controlled and local government road networks will be affected. Sufficient information should also be provided to enable an independent assessment of how the rail network (including infrastructure) will be affected. In both cases the impact on stakeholders along the whole route should be detailed and how any impacts will be managed.

The EIS should include detailed analysis of probable impact of identified construction and operational traffic generated by the project with particular concern to impacts on road infrastructure, road users and road safety.

The EIS needs to identify impacts on the State-controlled and local government road networks and to indicate clearly the corrective measures necessary to address adverse road impacts and the costs involved. This will require the proponent to compare the traffic situation and road conditions with, and without, the project. The impact assessment should clearly identify road or rail sections that may require upgrading or additional maintenance.

New road, or road realignment, impacts should be described.

The Main Roads' Guidelines for Assessment of Roads Impacts of Development Proposals will assist the proponent in assessing road impacts when preparing the EIS. Information about the impacts and proposed measures for dealing with those impacts, should be prepared by the proponent in close consultation with the local District Office of the Department of Main Roads. Consultation about road impacts should also include relevant local governments where local roads are being considered in haulage route options.

The EIS should provide details of the impact on any current or proposed rail infrastructure.

Provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport nodes of the proposal. Indicate whether there is a need to update the plans based on increase in frequency of traffic and volumes to be transported.

The EIS should also address the potential impacts on privately owned or port authority operated ports and State-controlled, Commonwealth-controlled or privately owned airports.

5.1.2.7 Decommissioning

The strategies and methods for progressive and final rehabilitation of the environment disturbed by the proposal and related activities should be described in the context of the expected final landform, vegetation community for nominated sustainable final land uses for each disturbance type. The final topography of all sites should be shown.

The means of decommissioning the project, in terms of removal of plant, equipment, structures and buildings should be described. The methods proposed for the stabilisation of the affected areas should be given. Final rehabilitation of the plant site should be discussed in terms of ongoing land use suitability and land use, management of any residual contaminated land and other land management issues.

A rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The strategic approach to progressive and final rehabilitation should be described.

Proposals to divert creeks during operations, and, if applicable, for the reinstatement of the creeks after operations have ceased, should be provided. Where dams are to be constructed, proposals for the management of these structures after the completion of the project should be given. Also, the final drainage and seepage control systems and long-term monitoring plans should be described.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed.

Information should be provided regarding decommissioning and rehabilitation of the plant site, removal of processing plant, rehabilitation of concrete footings and foundations, hardstand areas, storage tanks and wharfage (including any potential for reuse of these facilities).

5.2 Climate

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (eg temperature inversions) that may affect air quality within the environs of the proposal. Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the proposal site. The vulnerability of the area to natural or induced hazards, such as floods and bushfires, should also be addressed. The relative frequency, magnitude and risk of these events should be considered.

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed in Section 5.1. The impacts of winds and temperature inversions on air quality should be addressed in Section 5.4.

5.3 Water Resources

5.3.1 Description of Environmental Values

This section describes the existing environment for water resources, which may be affected by the proposal (both on and off site), in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection Policies.

5.3.1.1 Surface Waterways

A description should be given of the surface water courses, including the BRD (currently under construction), and their quality and quantity in the area affected by the proposal with an outline of the significance of these waters to the river catchment system in which they occur. Details provided should include a description of existing surface drainage patterns, flows in major streams and wetlands. Also provide details of the likelihood of flooding (particularly impacts associated with the BRD) including extent, levels and frequency, and a description of present and potential water uses downstream of the areas affected by the proposal. Flood studies should include a range of annual exceedance probabilities for affected waterways, where data permits.

An assessment is required of existing water quality in surface waters likely to be affected by the proposal. The basis for this assessment should be relevant water quality monitoring data.

The water quality should be described, including seasonal variations or variations with flow where applicable. A relevant range of physical, chemical and biological parameters should be considered to gauge the environmental harm on any affected creek or wetland system, including the BRD (currently under construction).

Describe the environmental values of the surface waterways of the affected area in terms of:

- values identified in the *Environmental Protection (Water) Policy 1997*;
- sustainability, including both quality and quantity;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form; and
- any water resource plans, land and water management plans relevant to the affected catchment.

The likely water supply for construction and mining is from the BRD. However, in the event that water is sourced from another resource, then the impact of removing 2,400ML of water annually from surface water resources in the area will be assessed.

5.3.1.2 Groundwater

The EIS should review the quality, quantity and significance of groundwater in the proposal area, together with groundwater use in neighbouring areas.

The review should include a summary of existing groundwater supply facilities (bores, wells, or excavations) to the extent of any environmental harm. The information to be gathered for analysis is to include:

- location;
- pumping parameters;
- draw down and recharge at normal pumping rates; and
- seasonal variations (if records exist) of groundwater levels.

A network of observation points which would satisfactorily monitor groundwater resources both before and after commencement of operations should be developed.

This section should include reference to:

- Nature of the aquifer/s
- geology/stratigraphy - such as alluvium, volcanic, metamorphic;
- aquifer type - such as confined, unconfined; and
- depth to and thickness of the aquifers.

Hydrology of the aquifer/s

- depth to water level and seasonal changes in levels;
- groundwater flow directions (defined from water level contours);

- interaction with surface water;
- interaction with sea/salt water;
- possible sources of recharge; and
- vulnerability to pollution.

The data obtained from the groundwater summary should be sufficient to enable specification of the major ionic species present in the groundwater, pH, electrical conductivity and total dissolved solids.

Describe the environmental values of the underground waters of the affected area in terms of:

- values identified in the *Environmental Protection (Water) Policy 1997*;
- sustainability, including both quality and quantity; and
- physical integrity, fluvial processes and morphology of groundwater resources.

5.3.2 Potential Impacts and Mitigation Measures

This section is to define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should describe the possible environmental harm caused by the proposed proposal to environmental values for water as expressed in the *Environmental Protection (Water) Policy 1997*.

Water management controls should be described, addressing surface (including BRD (currently under construction)) and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface (including BRD) and groundwater should be discussed, along with the proposal for the diversion of affected creeks during mining, and the stabilisation of those works. Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the proposal.

Key water management strategy objectives include:

- protection of important local aquifers and protection of their waters, and
- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota), and
- Protection of the water quality of the BRD and Burnett River.

Conduct a risk assessment for uncontrolled emissions to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts.

5.3.2.1 Surface Water and Water Courses

The potential environmental harm to the flow and the quality of surface waters (including BRD (currently under construction)) from all phases of the proposal should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, wetland and in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered. Refer to the *Environmental Protection (Water) Policy 1997* and *Water Act 2000*.

Quality characteristics discussed should be those appropriate to the downstream and upstream water uses that may be affected. Chemical and physical properties of any waste water (including concentrations of constituents) at the point of entering natural surface waters should be discussed along with toxicity of effluent constituents to flora and fauna.

Reference should be made to the properties of the land disturbed and processing plant wastes (including tailings), the technology for settling suspended sediments from contaminated water, and the techniques to be employed to ensure that contaminated water is contained and successfully treated on the site.

In relation to water supply and usage, and wastewater disposal, the EIS should discuss anticipated flows of water to and from the proposal area. Where dams, tailings dams, weirs or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the containing walls; and the quality of water contained and potential leachate, and flows and quality of water discharged. The design of all water storage facilities should follow the technical guidelines on site water management.

The need or otherwise for licensing of any dams (including referable dams) or creek diversions, under the *Water Act 2000* should be discussed. Water allocation and water sources should be established in consultation with the DNRM and associated authorities for the taking of any water.

The Australian and New Zealand Environment and Conservation Council (ANZECC) 'National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality' (2000) and the *Environmental Protection (Water) Policy 1997* should be used as a reference for evaluating the effects of various levels of contamination.

Options for mitigation and the effectiveness of mitigation measures should be discussed with particular reference to sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

5.3.2.2 Groundwater

The EIS should include an assessment of the potential environmental harm caused by the proposal to local groundwater resources.

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the proposal to groundwater depletion or recharge, and propose management options available to monitor and mitigate these effects. The response of the groundwater resource to the progression and finally cessation of the proposal should be described.

An assessment should be undertaken of the impact of the proposal on the local ground water regime caused by the altered porosity and permeability of any land disturbance.

An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be discussed. An example includes assessing impacts on groundwater (ie, potential leachate, water quality) as a result of tailings dam storage.

5.4 Air

5.4.1 Description of Environmental Values

The function of this section is to describe the existing air environment, which may be affected by the Project in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection (Air) Policy 1997).*

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide baseline data. Parameters should include air temperature, wind speed and direction, background dust deposition and any other major constituents of the air environment.

Should it be required then data on atmospheric stability, mixing depths and other parameters necessary for modelling of air emissions should be included in this section.

5.4.2 Potential Impacts and Mitigation Measures

The function of this section is to define and describe the objectives for protecting environmental values for air, to describe how nominated quantitative standards and indicators may be achieved and how the achievement of the objectives will be monitored, audited and managed. The objectives for air emissions should be stated in respect of relevant standards, relevant emission guidelines and any relevant legislation.

Air quality predictions from the proposed levels of emissions should be compared with the current National Environment Protection (Ambient Air Quality) Measure for ambient air quality and the Environmental Protection (Air) Policy 1997).

Discuss the following:

- features of the Project designed to suppress or minimise emissions, including dust, odours and air emissions (if necessary);
- the proposed levels of emissions from the processing plant including emissions during normal and upset conditions. Consideration should be given to the range of potential upset condition scenarios including the air emissions that may be generated as a result;
- the limitations and accuracy of any atmospheric dispersion models used for air quality predictions;
- comparison of air quality predictions to the relevant goals in the National Environmental Protection (Ambient Air Quality) Measure and the Environmental Protection (Air) Policy 1997); and
- impacts on sensitive receptors such as nearest residences, the National Park and surrounding horticulture/agriculture activities.

5.5 Waste

This section should complement other sections of part 5 of the EIS by providing technical details of waste treatment and minimisation, with proposed emission, discharge and disposal criteria, while other sections describe how those emissions, discharges and disposals would impact on the relevant environmental values. The purpose of this format is to concentrate the technical information on waste management into one section in order to facilitate its transfer into the EM plan.

5.5.1 Description of Environmental Values

This section describes the existing environment values that may be affected by the project's wastes in the context of environmental values as defined by the *Environmental Protection Act 1994* and applicable Environmental Protection Policies. Refer to each of the waste streams described in section 5.6 and provide references to environmental values described in other sections of part 5 of the EIS.

5.5.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by wastes, describes how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

This section should assess the potential impact of all wastes to be generated and provide details of each waste in terms of:

- operational handling and fate of all wastes including storage;
- on-site treatment methods proposed for the wastes;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on environmental values;
- proposed discharge/disposal criteria for liquid and solid wastes;
- measures to ensure stability of the dumps and impoundments should be described;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dumps should be given;
- market demand for recyclable waste (where appropriate) should be addressed; and
- waste minimisation techniques processes proposed.

Having regard for the *Environmental Protection (Waste) Policy 2000*, the EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during the construction and operating phases of the proposal. The EPA has also released draft guidelines covering aspects of waste management under this EPP, which should be addressed.

Having regard for the requirements of the *Environmental Protection (Water) Policy 1997*, the EIS should present the methods to avoid stormwater contamination by raw materials, wastes or products and present the means of containing, recycling, reusing, treating and disposing of stormwater. Where no-release water systems are to be used, the fate of salts and particulates derived from intake water should be discussed.

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly nitrogen oxides, sulphur oxides, particulates and carbon dioxide. Particular attention should be paid to measures, which will maximise energy efficiency and minimise internal energy consumption in the proposal.

Cleaner production waste management planning should be detailed especially as to how these concepts have been applied to preventing or minimising environmental impacts at each stage of the proposal. Details on natural resource use efficiency (eg energy and water), integrated processing design, co-generation of power and by-product reuse as shown in a material/energy flow analysis are required.

5.6 Noise and Vibration

5.6.1 Description of Environmental Values

This section describes the existing environment values that may be affected by noise and vibration from the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and environmental protection policies.

If the proposed activity could adversely impact on the noise environment, baseline monitoring may be undertaken at a selection of sensitive sites affected by the proposal. Noise sensitive places (eg, the National Park) are defined in the *Environmental Protection (Noise) Policy 1997*. The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Sufficient data may be gathered to provide a baseline for later studies. Monitoring methods should adhere to relevant Environmental Protection Agency Guidelines and Australian Standards, and any relevant requirements of the *Environmental Protection (Noise) Policy 1997*.

Comment should be provided on any current activities near the proposal area that may cause a background level of ground vibration (for example: major roads, quarrying activities, etc.).

5.6.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by noise and vibration, describes how nominated quantitative standards and indicators may be achieved for noise and vibration management, and how the achievement of the objectives will be monitored, audited and managed.

Information, including mapped noise contours from a suitable acoustic model (if necessary), should be submitted on the proposed generation of noise. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. This should also include environmental harm on animals and avifauna particularly migratory species. Proposals for buffers to minimise or eliminate these effects including details of any screening, lining, enclosing or bunding should be provided. Timing schedules for construction and operations should be discussed with respect to minimising environmental impacts from noise.

Consideration should be given to the emission of low-frequency noise (noise with components below 200Hz) from major items of plant or equipment and, if necessary, measures should be described for reducing the intensity of these components.

Information should be supplied on blasting which might cause ground vibration or fly rock on or adjacent to the site with particular attention given to places of work or residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. Measures to prevent or minimise environmental harm, including nuisance, should be discussed.

Off-site transport noise and vibration factors due to road or rail should be described.

5.7 Nature Conservation

5.7.1 Description of Environmental Values

This section describes the existing environment values for nature conservation that may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection Policies,* and the *Nature Conservation Act 1992*.

Describe the environmental values of nature conservation for the affected area in terms of:

- integrity of ecological processes, including habitats of rare and threatened species;
- conservation of resources;
- biological diversity, including habitats of rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places; and
- aquatic and terrestrial ecosystems.

A discussion should be presented on the nature conservation values of the areas likely to be affected by the proposal. The flora and fauna communities which are rare or threatened, environmentally sensitive localities including waterways, riparian zone, rainforest remnants, old growth indigenous forests, wilderness and habitat corridors should be described. The description should include a plant species list, a vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective. The description should indicate any areas of state or regional significance identified in an approved biodiversity planning assessment (BPA) produced by the EPA (e.g. see the draft Regional Nature Conservation Strategy for SE Qld 2001-2006).

The EIS should identify issues relevant to sensitive areas, or areas, which may have, low resilience to environmental change. Areas of special sensitivity may wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species, bat roosting and breeding caves including existing structures such as adits and shafts, and habitat of threatened plants, animals and communities. The capacity of the environment to assimilate discharges/emissions should be assessed. Proposal proximity to any biologically sensitive areas should be described.

Reference should be made to both State and Commonwealth Endangered Species Legislation and the proximity of the area to the Great Barrier Reef World Heritage Property.

The Queensland *Vegetation Management Act 2000* and the findings of any regional vegetation management plan should also be referenced.

The occurrence of pest plants and animals in the project area should be described.

Key flora and fauna indicators should be identified for future ongoing monitoring. Surveys of flora and fauna need to be conducted throughout the year to reflect seasonal variation in communities and to identify migratory species.

5.7.1.1 Terrestrial Flora

For terrestrial vegetation a map at a suitable scale should be provided, with descriptions of the units mapped. Sensitive or important vegetation types should be highlighted, including any riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare or threatened species should be specifically addressed. The surveys should include species structure, assemblage, diversity and abundance. The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

The location of any horticultural crops in the vicinity of the site should be shown. The existence of important local and regional weed species should also be discussed.

Vegetation mapping should provide vegetation mapping for all relevant project sites including new transport infrastructure, port facilities and irrigation land if relevant. Adjacent areas may also require mapping.

The terrestrial vegetation communities within the affected areas should be described at an appropriate scale (i.e. 1:10,000) with mapping produced from aerial photographs and ground truthing, showing the following:

- location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with The Conservation Status of Queensland's Bioregional Ecosystems. (Sattler P.S. & Williams R.D. 1997 2nd edition) and the EPA's web site listing the conservation status of regional ecosystems;
- location of vegetation types of conservation significance based on EPA's regional ecosystem types and occurrence of species listed as Protected Plants under the Nature Conservation (Wildlife) Regulation 1994 and subsequent amendments, as well as areas subject to the Vegetation Management Act 1999;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (National Parks, Conservation Parks, Resource Reserves, Nature Refuges);
- any plant communities of cultural, commercial or recreational significance should be identified; and
- location and abundance of any exotic or weed species.

Existing information on plant species may be used instead of new survey work provided that the data is derived from surveys consistent with the above requirements. Methodology used for flora surveys should be specified in the appendices to the report.

5.7.1.2 Terrestrial Fauna

The terrestrial and riparian fauna occurring in the areas affected by the proposal should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The description of the fauna present or likely to be present in the area should include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species which are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the existence of feral or exotic animals;
- existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans); and
- use of the area by migratory birds, nomadic birds, fish and terrestrial fauna.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the province where the site of the proposal occurs.

Existing information on species may be used instead of new survey work provided that the data is derived from surveys consistent with the above requirements.

5.7.1.3 Aquatic Biology

If no biota surveys/studies have previously been conducted in and downstream of the project area, the aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways. The description of the fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area;
- aquatic plants;
- aquatic and benthic substrate; and
- habitat downstream of the project.

Existing information on species may be used instead of new survey work provided that the data is derived from surveys consistent with the above requirements.

5.7.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing nature conservation environmental values, describes how nominated quantitative standards and indicators may be achieved for nature conservation management, and how the achievement of the objectives will be monitored, audited and managed.

The discussion should cover all likely direct and indirect environmental harm on flora and fauna, particularly on the sensitive areas as listed below. Terrestrial and aquatic environments should also be covered. Also include human impacts and the control of any domestic animals introduced to the area.

Strategies for protecting World Heritage Property, and any rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (i.e. JAMBA, CAMBA) should be discussed.

The potential environmental harm to the ecological values of the area arising from the construction, operation and decommissioning of the project including clearing, salvaging or removal of vegetation should be described, and the indirect effects on remaining vegetation should be discussed. Short-term and long-term effects should be considered with comment on whether the effects are reversible or irreversible. Mitigation measures and/or offsets should be proposed for adverse impacts. Any departure from no-net-loss of ecological values should be described.

The potential environmental harm on flora and fauna of any alterations to the local surface and ground water environment should be discussed with specific reference to environmental harm on riparian vegetation or other sensitive vegetation communities. Measures to mitigate the environmental harm to habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described.

In relation to mining below the FSL, develop an understanding of lungfish presence adjacent to the project area as a basis for identifying habitat-enhancement rehabilitation strategies.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory, nomadic and aquatic animals should be discussed.

Weed control strategies aimed at containing existing weed species (eg. parthenium and other noxious weeds) and ensuring no new invasive weeds are introduced to the area are required, and feral animal management strategies should be addressed. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Reference should be made to the local government authorities' pest management plan when determining control strategies.

Rehabilitation of disturbed areas should incorporate where appropriate provision of nest hollows and ground litter.

Areas regarded as sensitive with respect to flora and fauna have one or more of the following features (and which should be identified, mapped, avoided or effects minimised):

- important habitats of species listed under the *Nature Conservation Act 1992* and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems recognised by the Environmental Protection Agency as 'endangered' or 'of concern' and/or ecosystems listed as presumed extinct, endangered or vulnerable under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*;
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as RAMSAR wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;

- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA);
- sites adjacent to nesting beaches, feeding, resting or calving areas of species of special interest;
- sites containing common species which represent a distributional limit and are of scientific value or which contains feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance;
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
    - natural vegetation in good condition or other habitat in good condition (e.g. wetlands); and/or
    - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area;
- a site containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; coral reefs; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- sites of palaeontologic significance such as fossil sites;
- sites of geomorphological significance, such as lava tubes or karst;
- protected areas which have been proclaimed under the *Nature Conservation Act 1992* or are under consideration for proclamation; and/ or
- areas of major interest, or critical habitat declared under the *Nature Conservation Act 1992* or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999*.

5.8 Cultural Heritage

5.8.1 Description of Environmental Values

This section describes the existing cultural heritage values that may be affected by the proposal. Describe the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.

At all times the Proponent has a Duty of Care to protect Aboriginal heritage as defined under Part 3 of the *Aboriginal Cultural Heritage Act 2003* and as provided by the Duty of Care Guidelines gazetted on the 16th April 2003.

A cultural heritage study may be required that will describe indigenous and non-indigenous cultural heritage sites and places, and their values. In accordance with the relevant legislation (*Aboriginal Cultural Heritage Act 2003 and Queensland Heritage Act 1992*), such a study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with relevant indigenous community/communities concerning:
    - places of significance to that community (including archaeological sites, natural sites, story sites etc;
    - appropriate community involvement in field surveys;
- any requirements by communities and /or informants relating to confidentiality of site data must be highlighted. Non-indigenous communities may also have relevant information;

- a systematic survey of the proposed development area to locate and record indigenous and non-indigenous cultural heritage places;
- significant assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values; and
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

5.8.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values, describes how nominated quantitative standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

The environmental harm to cultural heritage values in the vicinity of the project should be managed under a cultural heritage management plan (CHMP) developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological and/or anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

- a process for including Aboriginal/Torres Strait islander people associated with the development areas in protection and management of indigenous cultural heritage;
- processes for mitigation, management and protection of identified cultural heritage places and material in the project areas, including associated infrastructure developments, both during the construction and operational phases of the project;
- provisions for the management of the accidental discovery of cultural material, including burials;
- the monitoring of foundation excavations and other associated earthwork activities for possible sub-surface cultural material;
- cultural awareness training or programs for project staff; and
- a conflict resolution process.

The development of the CHMP should be negotiated with all stakeholder representatives.

Aspects of the above matters may be referred to the Land and Resources Tribunal and some may also involve native title considerations.

5.9 Social

5.9.1 Description of Environmental Values

This section describes the existing social values that may be affected by the proposal.

The amenity and use of the proposal area and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential purposes should be described. Consideration should be given to:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area;
- health and educational facilities;
- on farm activities near the proposed activities;

- current property values;
- number of properties directly affected by the project; and
- number of families directly affected by the project, this should include not only property owners but families of workers either living on the property or workers where the property is their primary employment.

Describe the social values for the affected area in terms of:

- the integrity of social conditions, including amenity and liveability, harmony and well being, sense of community, access to recreation, and access to social and community services and infrastructure.; and
- public health and safety (refer to section 5.10).

Social, economic and cultural values are not as easily separated as physical and ecological values. Therefore it may be necessary for some material in this section to be cross referenced with section 5.8 Cultural Heritage and Section 5.12 Economy.

5.9.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing social values, describes how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The social impact assessment of the project should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the project's impact, both beneficial and adverse, on the local community. The impacts of the project on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level.

Attention should be paid to:

- impacts on demographic, social, cultural and economic profiles;
- impacts on local residents, landowners/landholders, current land uses and existing lifestyles and enterprises;
- impacts on local and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. The impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion is to be addressed. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed;
- comment should be made on how much service revenue and work from the project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the project;
- impacts on local residents values and aspirations; and
- in regard to affected indigenous and non-indigenous communities respectively, particular attention should be paid to the effects on:
  - the ability of both indigenous and non-indigenous people, to live in accordance with their own values and priorities;
  - the use of and access to culturally important areas and landscapes;
  - the access to existing human and commercial services and housing;
  - the ability to participate in regional and local employment and training opportunities; and

- the new project workforce and their families.

The extent that enterprises operated by landowners/landholders (for example livestock grazing etc) which may be impacted upon by the mining operation (during and post mining) will be taken into account. For example, impacts where livestock exclusions diminish the landowners/landholders ability to use the property for grazing (during and post mining) will be considered.

The effects of the proposal on local and regional residents, including land acquisition and relocation issues and property valuation and marketability, community services and recreational activities should be described for the construction and operations phases of the development.

The potential environmental harm on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, or scientific or residential purposes should be discussed. The implications of the proposal for future developments in the local area including constraints on surrounding land uses should be described.

For identified impacts to social values, suggest mitigation and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes should also be recommended.

5.10 Health and Safety

5.10.1 Description of Environmental Values

This section describes the existing community values for health and safety that may be affected by the proposal. Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise. Consideration should also be given to impacts on visitor safety in the vicinity of the National Park as a result of heavy vehicle movements in these areas.

5.10.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing health and safety community values, describes how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should assess the effects on the project workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from project operations and emissions.

Measures to control mosquito and biting midge breeding need to be described.

Practical monitoring regimes should also be recommended in this section.

5.11 Economy

5.11.1 Description of environmental values

This section describes the existing economic environment that may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection Policies*.

The character and basis of the local and regional economies should be described including:

- existing housing market, particularly rental accommodation which may be available for the project workforce;
- economic viability (including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc); and
- historical descriptions of large-scale resource developments and their effects in the region.

The economic impact statement should include estimates of the opportunity cost of the project and the value of ecosystem services provided by natural or modified ecosystems to be disturbed or removed during development.

5.11.2 Potential Impacts and Mitigation Measures

The function of this section is to define and describe the objectives and practical measures for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic management, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local and State labour markets should be discussed with regard to the source of the workforce. This information should be presented according to occupational groupings of the workforce. In relation to the source of the workforce, clarification is required as to whether the proponent, or contractors, are likely to employ locally or through other means and whether there are initiatives for local employment opportunities. The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the project should be discussed.

Any new skills and training to be introduced in relation to the project should be identified. Adequate provision should be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated should be indicated.

An economic analysis, including a cost-benefit analysis, should be presented from national, state, regional and local perspectives as appropriate to the scale of the project. The general economic benefits from the project should be described.

The analysis is to include:

- the significance of this proposal on the local and regional economic context;
- the long and short-term beneficial (eg. job creation) and adverse (eg. competition with local small business) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the project by local businesses or communities;
- the cost to all levels of government of any additional infrastructure provision;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the potential economic impact of any major hazard identified in section 4.13;
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups;
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future; and
- impacts on local property values.

Consideration of the impacts of the project in relation to energy self-sufficiency, security of supply and balance of payments benefits may be discussed. Attention should be directed to the long and short-term effects of the project on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies should be referred to the government for input before undertaking the studies.

For identified impacts to economic values, suggest mitigatory and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes should also be recommended.

5.12 Hazard and Risk

5.12.1 Description of Environmental Values

This section describes the potential hazards and risk that may be associated with the proposal.

Detail the environmental values likely to be affected by any hazardous materials and actions incorporated in the proposal. The degree and sensitivity of risk should be detailed.

An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the proposal on sensitive areas and resources such as

forests, water reserves, State and local Government controlled roads, places of residence and work, and recreational areas.

5.12.2 Potential Impacts and Mitigation Measures

The function of this section is to define and describe the objectives for protecting or enhancing environmental values from hazards and risk, to describe how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed.

An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the Project on sensitive areas and resources such as water reserves (including the BRD), State and local government controlled roads, places of residence and work, and recreational areas. The State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide should be referred to as a guideline for this process.

Detail whether there is adequate water supply for fire fighting on the Project.

The assessment should outline the implications for the impacts on surrounding land uses, and involve consultation with the Department of Emergency Services, Queensland Fire and Rescue Authority and Queensland Ambulance Service where required. Consultation with the appropriate Shire Council and government departments regarding Disaster Risk Management Studies, Counter Disaster Plans and Emergency Management Plans should be conducted.

Information required in future Emergency Management Plans and Risk Management Systems should be identified and considered.

5.13 Cross reference with Terms of Reference

This section provides a cross reference of the findings of the relevant sections of the EIS, where the potential impacts and mitigation measures associated with the project are described, with the corresponding sections of the TOR.

6.0 Environmental Management Overview Strategy

The EMOS for a proposed mining Project is an integral part of the EIS. It should be developed from the preceding information in the EIS, but should be capable of being read as a stand-alone document without reference to other parts of the EIS. The general contents of the EMOS should comprise:

- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives i.e. levels of expected environmental harm, performance standards and associated measurable indicators, including progressive and final rehabilitation, performance monitoring and reporting; and
- control strategies to implement the commitments.

The QEPA Guideline 8 Preparation of an Environmental Management Overview Strategy should be used to prepare the EMOS.

A Plan of Operations (Plan) will be required to be lodged before commencement of activities for a period of up to five years.

7.0 References

All references consulted should be presented in the EIS in a recognised format. Example references are in Attachment 1.

8.0 Recommended appendices

8.1 Final Terms of Reference for this EIS

A copy of the final TOR should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the TOR at least should be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the TOR to the relevant section of the EIS, should also be provided in the EIS. For this purpose the TOR should be line numbered.

8.2 Development approvals

A list of all the development approvals required by the project should be presented.

8.3 The Standard Criteria

A brief summary should be provided of the proposal's compatibility with the standard criteria, as defined in Schedule 3 of the *Environmental Protection Act 1994*, and any other matter prescribed by a regulation. Consideration should focus on The National Strategy for Ecologically Sustainable Development, published by the Commonwealth Government in December 1992 (available from the Australian Government Publishing Service). Each principle should be discussed and conclusions drawn as to how the proposal conforms. A life-of-project perspective should be shown.

8.4 Research

Proposals for researching alternative environmental management strategies or for obtaining any further necessary information should be outlined in an appendix.

8.5 Consultation Report

A list of referral agencies should be provided in a summary consultation report, which should also list the Commonwealth, State and local government agencies consulted, and the individuals and groups of stakeholders consulted.

The EIS should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The discussion should include the methodology used in the community consultation program including criteria for identifying stakeholders and the communication methods used.

The EIS should describe how 'interested' and/or 'affected persons' (EP Act) and 'affected parties' (EPBC Act) were identified.

8.6 Study Team

The qualifications and experience of the study team and specialist sub-consultants and expert reviewers should be provided.

8.7 Specialist Studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. As agreed with the EPA the results of specialist studies with potentially confidential information (eg cultural heritage) may not be made publicly available.

9.0 Approved by

Signed by D Ellwood	**3 November 2004**
Signature	Date

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