

Terms of Reference for the Newlands Coal Project – Extension into the Wollombi surface area

PROJECT BACKGROUND	3
Project proponent	3
Project description	3
CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT	4
EXECUTIVE SUMMARY	4
GLOSSARY OF TERMS	4
1. INTRODUCTION	4
1.1 Project proponent	4
1.2 Project description	4
1.3 Project objectives and scope	4
1.4 The environmental impact assessment (EIA) process	4
1.4.1 Methodology of the EIS	4
1.4.2 Objectives of the EIS	5
1.4.3 Submissions	5
1.5 Public consultation process	5
1.6 Project approvals	6
1.6.1 Relevant legislation and policy requirements	6
1.6.2 Planning processes and standards	6
1.7 Accredited process for controlled actions under Commonwealth legislation	6
2. PROJECT NEED AND ALTERNATIVES	6
2.1 Project justification	6
2.2 Alternatives to the project	6
3. DESCRIPTION OF THE PROJECT	7
3.1 Location	7
3.1.1 Regional context	7
3.1.2 Local context	7
3.2 Construction	7
3.3 Operations	7
3.3.1 Location and tenure	7
3.3.2 Mine life and coal resource base	8
3.3.3 Mining methods and equipment	8
3.3.4 Mine sequencing	8
3.3.5 Processing and products	8
3.3.6 On-going evaluation and exploration activities	8
3.4 Product handling	8
3.5 Infrastructure requirements	8
3.5.1 Transport—road/rail/ship	9
3.5.2 Energy	9
3.5.3 Water supply and storage	9
3.5.4 Stormwater drainage	9
3.5.5 Sewerage	9
3.5.6 Telecommunications	9
3.5.7 Accommodation and other infrastructure	9
3.6 Waste management	9
3.6.1 Air emissions	10
3.6.2 Solid waste disposal	10

3.6.3 Liquid waste	10
3.7 Rehabilitation and decommissioning	10
4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS	11
4.1 Land	13
4.1.1 Description of environmental values	13
4.1.1.1 Topography/geomorphology	13
4.1.1.2 Geology	13
4.1.1.3 Mineral resources	13
4.1.1.4 Soils	14
4.1.1.5 Land use	14
4.1.1.6 Infrastructure	15
4.1.1.7 Sensitive environmental areas	15
4.1.1.8 Landscape character	15
4.1.1.9 Visual amenity	15
4.1.2 Potential impacts and mitigation measures	16
4.1.2.1 Land use suitability	16
4.1.2.2 Land disturbance	16
4.1.2.3 Land contamination	17
4.1.2.4 Soil erosion	17
4.1.2.5 Landscape character	18
4.1.2.6 Visual amenity	18
4.1.2.7 Lighting	18
4.1.2.8 Transport	18
4.2 Climate	19
4.3 Water resources	19
4.3.1 Description of environmental values	19
4.3.1.1 Surface waterways	19
4.3.1.2 Groundwater	20
4.3.2 Potential impacts and mitigation measures	20
4.3.2.1 Surface water and water courses	21
4.3.2.2 Groundwater	22
4.4 Air	22
4.4.1 Description of environmental values	22
4.4.2 Potential impacts and mitigation measures	22
4.5 Waste	23
4.5.1 Description of environmental values	23
4.5.2 Potential impacts and mitigation measures	23
4.6 Noise and vibration	23
4.6.1 Description of environmental values	23
4.6.2 Potential impacts and mitigation measures	24
4.7 Nature conservation	24
4.7.1 Description of environmental values	24
4.7.1.1 Terrestrial flora	25
4.7.1.2 Terrestrial fauna	26
4.7.1.3 Aquatic biology	26
4.7.2 Potential impacts and mitigation measures	26
4.7.3 Matters of National Environmental Significance	28
4.8 Cultural heritage	29
4.8.1 Description of environmental values	29
4.8.2 Potential impacts and mitigation measures	29
4.9 Social	30
4.9.1 Description of environmental values	30
4.9.2 Potential impacts and mitigation measures	30
4.10 Health and safety	32
4.10.1 Description of environmental values	32
4.10.2 Potential impacts and mitigation measures	32
4.11 Economy	32
4.11.1 Description of environmental values	32
4.11.2 Potential impacts and mitigation measures	33
4.12 Hazard and risk	33
4.12.1 Description of environmental values	33
4.12.2 Potential impacts and mitigation measures	33

4.13 Cross-reference with the terms of reference.....	34
5. ENVIRONMENTAL MANAGEMENT PLAN.....	34
6. REFERENCES	35
7. RECOMMENDED APPENDICES.....	35
A1. Final terms of reference for this EIS.....	35
A2. The standard criteria	35
A3. Study team.....	35
A4. Specialist studies	35
A5. Consultation report	35
A6. Research.....	36
8. APPROVED BY.....	36

PROJECT BACKGROUND

Project proponent

The proponent of the project is Newlands Coal ("Newlands"). Newlands is part of the NCA Joint Venture, an unincorporated joint venture of Xstrata Coal Queensland Pty Ltd (55 percent), Itochu Coal Resources Australia Pty Ltd (25 percent), ICRA NCA Pty Limited (10 percent) and Sumisho Coal Australia Pty Limited (10 percent).

Project description

The project involves open-cut coal mining of the Wollombi (Brigalow Area) pit, west of the current Suttor Creek operations on granted Mining Lease 4761. Additional surface area is required on the mining lease.

Newlands commenced coal mining operations in 1983 and currently produces 8.5Mt clean coal per annum via both open-cut and underground mining methods. Product coal is taken by train to the NCA managed port of Abbot Point for export.

In 1994, Newlands acquired the Suttor Creek mining lease (ML4761). Environmental approvals were gained in 2000, and open-cut operations began at Suttor Creek in February 2004. Coal is hauled to the coal handling and preparation plant at Newlands. There are no tailings or reject dumps at the Suttor Creek mining area or proposed for the new surface area.

Extension of the Suttor Creek operations into the western portion of the mining lease is now necessary to maintain the overall Newlands project coal qualities and volumes. The Wollombi area is located approximately 129km west of Mackay and 20km west of Glenden and is located in the Nebo Shire. The surface area application totals 777ha on the Wollombi pastoral lease (Real Property description 1/CP905226) and Reserve for Quarrying (Real Property description 2/CP845104). The land is currently used for low-intensity beef cattle grazing.

The overall Newlands project workforce and production rates may vary up and down over time; however, it is not anticipated that mining the Wollombi area in itself will significantly impact these operational characteristics. Potential open-cut resources of approximately 25 million tonnes have been defined in the Wollombi surface application area.

Open-cut mining of the area will be undertaken requiring clearing of vegetation, topsoil removal/replacement, overburden stockpiling, coal extraction and final rehabilitation of disturbed areas.

Minimal infrastructure, including haul roads, coal stockpiles, sedimentation facilities and power easements are required. There will be no coal preparation facilities, tailings or reject facilities on the Wollombi area.

Water usage of the project is limited to that required for dust suppression. Water requirements are not expected to exceed that provided by removal of ground water inflow to the pit and incident rainfall captured within the pit and spoil areas (approximately 200ML per annum).

The diversion of Suttor Creek will be assessed through a separate process involving an application to amend the current environmental authority. Similarly, it should be noted that the EIS will be required to address only those matters that impact on the Wollombi (Brigalow Area) for which surface rights are needed. Other aspects of the overall Newlands operation will or have been assessed through other applications.

CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

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. It should use plain English and avoid the use of jargon and esoteric terms. The structure of the executive summary should follow that of the environmental impact statement (EIS), and focus strongly on the key issues and conclusions.

Glossary of terms

A glossary of technical terms, acronyms and abbreviations should be provided.

1. 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.

1.1 Project proponent

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

1.2 Project description

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 3.

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.

1.3 Project objectives and scope

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.

1.4 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.

1.4.1 Methodology of the EIS

This section should provide a description of the impact assessment process steps, timing and decisions to be made for relevant stages of the project. This section should also indicate how the consultation process (which will be described in detail in section 1.5) would integrate with the other components of the impact assessment, including the stages, timing and mechanisms for public input and participation. The information in this section is required to ensure:

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

1.4.2 Objectives of the EIS

Having described the methodology of the environmental impact assessment, a succinct statement should be made of the EIS objectives. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The reader should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the project. While the terms of reference provide guidance on the scope of the EIS studies, they should not be seen as exhaustive or limiting.

If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the terms of reference are found to be relevant to the assessment of impacts of the proposal, those matters should be included in the EIS.

In addition, it is essential that the main text of the EIS should address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft environmental management plan (EM Plan).

When considering whether an impact is or is not significant, the proponent should take account of both the intensity of the impact and the context in which it would occur.

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. As such the main text should be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in appendices. The main text should not assume that a reader will have a prior knowledge of the project site. It should not be necessary for the reader to have visited the site to understand the issues involved in the proposal.

In brief, the EIS objectives should be 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 and their likely relative environmental management outcomes is a key aspect of the EIS.

The role of the EIS in providing the project's draft EM Plan should also be discussed, with particular reference to the EM Plan's role in providing management measures that can be carried over into conditions that would attach to any approval(s), environmental authorities and permits for the project.

1.4.3 Submissions

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

1.5 Public consultation process

An appropriate public consultation program, developed to the satisfaction of the Environmental Protection Agency (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.

The submission of a list of affected persons and interested persons as well as a statement of how the proponent proposes to consult with those persons is a statutory requirement of the EIS process in the *Environmental Protection Act 1994*. Similar requirements, though non-statutory, are usually applied to EIS processes under other State legislation.

The public consultation program should provide opportunities for community involvement and education. It may include interviews with individuals, public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local community and interest groups and should continue from project planning through commissioning, project operations and final decommissioning. Refer to the EPA guideline *Issue Identification and Community Consultation*.

1.6 Project approvals

1.6.1 Relevant legislation and policy requirements

This section should explain the legislation and policies controlling the approvals process including but not limited to the Queensland *Environmental Protection Act 1994* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Local government planning controls, local laws and policies applying to the development should be described, and a list provided of the approvals required for the project and the expected program for approval of applications. The discussion of approvals required for the project should include both on-lease and off-lease approvals.

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

1.6.2 Planning processes and standards

This section should discuss the project's consistency with existing land uses or long-term policy framework for the area (for example, as reflected in local and regional plans including the *Whitsunday Hinterland and Mackay (WHAM) Regional Plan*), 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 and assess the impacts of any relevant State Planning Policies applying to the land or nearby land that may be impacted upon by the project. This information is required to demonstrate how the proposal conforms with Commonwealth, State, regional and local plans for the area including the Nebo Shire planning scheme.

1.7 Accredited process for controlled actions under Commonwealth legislation

The project is a controlled action under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). The Commonwealth has accredited the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of the EPBC.

The terms of reference should address potential impacts on the matters of National Environmental Significance (NES) that were identified in the 'controlling provisions' when the project was declared a controlled action.

The controlling provisions are 'Listed threatened species and communities'. These 'Matters of National Environmental Significance', should be addressed as required in section 4.7.3. This subsection should address exclusively and fully the issues relevant to the controlling provisions.

2. Project need and alternatives

2.1 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.

2.2 Alternatives to the project

This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. 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. Comparative environmental impacts of each alternative should be summarised.

The interdependencies of the proposal components should be explained, particularly in regard to how each of any industrial developments, or various combinations of industrial developments, and any infrastructure requirements relate to the viability of the proposal. Should water supply, power, transport and/or storage infrastructure be included as an element of the proposal, this section should include a description of and rationale for such infrastructure.

Reasons for selecting the preferred options should include technical, commercial, social and natural environment aspects. In particular, the principals of ecologically sustainable development (ESD) and

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

This information is required to assess why the scope of the proposal is as it is and to ensure that the ESD principles and sustainable development aspects have been considered and incorporated during the scoping and planning of the proposal.

3. 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.

3.1 Location

3.1.1 Regional context

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

3.1.2 Local context

The local context of the proposal should be described and illustrated on maps at suitable scales. Real property descriptions of the project site should be provided.

3.2 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 and other construction inputs to be transported onto the construction site. Any staging of the proposal should be described and illustrated showing site boundaries, development sequencing and timeframes. Routes that will be used to haul inputs such as steel, concrete, quarry materials and fuel should be identified. 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 and/or how they will be transported to the site.

3.3 Operations

The location and nature of the processes to be used should be described in the text and illustrated with maps and diagrams as required. 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 and other operational inputs such as petroleum, explosives and other supplies to be used.

Concept and layout plans should be provided highlighting proposed buildings, structures, plant and equipment. The nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw materials, should be described.

3.3.1 Location and tenure

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 (for example, land, water, forests, energy, etc.). Maps at suitable scales should be provided showing the precise location of the project area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject;
- the location and boundaries of the project footprint showing all key aspects including excavations, stockpiles, areas of fill, watercourses, water storages, buildings, culverts, hardstands, car parks, etc; 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 land and mining tenures and natural and built features of the area.

3.3.2 Mine life and coal resource base

Specific details should be provided of the following:

- the proposed mine life and an outline of the coal/mineral resource base; and
- the quantity of coal/mineral to be mined annually including any proposed ramping of production or staging of development.

3.3.3 Mining methods and equipment

Specific details should be provided of the following:

- the mining type and methods to be used, including the major equipment to be used in the various components of the operation;
- the use of different techniques in areas of different topographic or geo-technical character; and
- chemicals to be used.

Figures should be provided if required.

3.3.4 Mine sequencing

Specific details should be provided of the following:

- the proposed sequence and timing of mining of each seam/ore body within the mining lease;
- the physical extent of excavations, location of stockpiles of overburden and/or coal/mineral reject to be handled during the project's operation or left after mining ceases;
- the proposed progressive backfilling of excavations; and
- the area disturbed at each major stage of the project.

3.3.5 Processing and products

This section should describe the quantities and characteristics of the products produced on an annual basis.

3.3.6 On-going evaluation and exploration activities

This section should describe the extent and nature of any proposed on-going exploration or geological/geotechnical evaluation within the project area that may be required over the life of the project.

3.4 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;
- from the storage facilities to the transport facilities; and
- from transport facility to port or domestic use.

Include discussion of any environmental design features of these facilities including bunding of storage facilities.

3.5 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 and beyond, where required for the project. Any services that encroach on state-controlled road reserves should be identified on plans. Approval from Main Roads may be required before construction in or across road reserves commences.

3.5.1 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 of any transport related infrastructure.

Provide details of proposed changes, if any, in the use of rail for transport of materials, products or wastes to or from the project site. In relation to shipping of products, details any change in the number of ships and their size should be documented.

3.5.2 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.

3.5.3 Water supply and storage

The EIS should provide information on water usage by the project, including the quality and quantity of any additional water supplied to the site and the rate of groundwater pumping from the pit. In particular, the proposed and optional sources of water supply should be described, for example bores, any surface storages such as dams and weirs, and municipal water supply pipelines.

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.

3.5.4 Stormwater drainage

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

3.5.5 Sewerage

This section should describe, in general terms, the sewerage infrastructure required by the project.

3.5.6 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.

3.5.7 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/crib facilities;
- fuel storage areas; and
- equipment hardstand and maintenance areas.

The EIS should assess the capacity of the existing facilities and determine any requirement for additional accommodation or technical workshops and laboratories. Detailed assessment of impacts of new accommodation and infrastructure on social values should be provided in section 4.9.

3.6 Waste management

Provide an inventory of all wastes to be generated by the proposal during the construction, operational and decommissioning 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 raw materials processed;
- the amount of resulting process wastes; and

- the volume and tonnage of any re-usable by-products.

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

Schematic diagrams should be provided for each distinct stage of the project (for example, construction/site preparation, commissioning, operation and decommissioning) indicating the associated waste streams (that is, 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.

3.6.1 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. Particulate emissions include those that would be produced by any industrial process, or disturbed by wind action on stockpiles and conveyors, or by transportation equipment (either by entrainment from the load or by passage on unsealed roads).

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

3.6.2 Solid waste disposal

The EIS should confirm there would be no landfill facility on the project. Any solid waste streams should be estimated for both construction and operation.

3.6.3 Liquid waste

A description should be presented of the origin, quality and quantity of wastewater and any immiscible liquid waste 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 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 (that is, run-off plus any seepage or leakage);
- seepage from other waste storages;
- water usage for
 - dust suppression, and
 - domestic purposes;
- evaporation;
- domestic sewage treatment - disposal of liquid effluent and sludge; and
- water supply treatment plant - disposal of wastes.

3.7 Rehabilitation and decommissioning

This section should describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by the proposal. The strategic approach to progressive and final rehabilitation should be described. A preferred rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The final topography of any excavations, waste areas and dam sites should be shown on maps at a suitable scale. The stability of the final landform and likely final vegetation coverage should be addressed.

The strategies and methods presented for progressive and final rehabilitation of disturbed areas should demonstrate compliance with the objectives of the *Environmental Management Policy for Mining in Queensland (1991)* or with updated versions of that policy as they become available. Land suitability assessment should follow the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995)*. In particular, the strategies and methods should have the following objectives:

- Mining and rehabilitation should aim to create a landform with land use capability and/or suitability similar to that prior to disturbance unless other beneficial land uses are pre-determined and agreed.
- Mine wastes and disturbed land should be rehabilitated to a condition that is self-sustaining, or to a condition where the maintenance requirements are consistent with an agreed post mining land use.
- Surface and ground waters that leave the lease should not be degraded to a significant extent. Current and future water quality should be maintained at levels that are acceptable for users downstream of the site.

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. Information should be provided regarding decommissioning and rehabilitation of the plant site, rehabilitation of concrete footings and foundations, hardstand areas and storage tanks (including any potential for reuse of these facilities). Options and methods for the disposal of wastes from the demolition of plant and buildings should be discussed in sufficient detail for their feasibility and suitability to be established.

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.

The EIS should provide evidence of the salinity, sodicity, dispersivity and sulfide content of overburden and describe how the potential impacts of placement of material with any undesirable properties might affect the rehabilitation of the site. The EIS should also describe the necessary mitigation measures, with particular focus on how they will be incorporated into mine planning via the EM Plan and Plan of Operations.

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. The topsoil management plan derived from completed soil survey data should also include:

- topsoil stripping depths and criteria of suitability; and
- determination of total available topsoil volumes for project rehabilitation purposes as related to the areas of disturbance for the site.

Revegetation methods and proposed species should be described along with the proposed monitoring strategy.

Detail of the impacts of the preferred rehabilitation strategy should be discussed in the appropriate subsections of section 4 (environmental values and management of impacts) with regard to such issues as the disposal of waste and the long-term quality of water in any final voids. Implications for the long-term use and fate of the site should also be addressed, particularly with regard to the on-site disposal of waste and the site's inclusion on the Environmental Management Register or Contaminated Land Register.

4. 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 in section 9 of the *Environmental Protection Act 1994*, environmental protection policies and other documents such as the ANZECC 2000 guidelines. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines. 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;

- to describe any cumulative impacts on environmental values caused by the proposal, either in isolation or by combination with other known existing or planned sources of contamination;
- 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, and 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 other 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 (including *Regional Vegetation Management Code for Ongoing Clearing Purposes Nebo-Broadsound (Brigalow Belt Bioregion)*). 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, both natural and built (such as land, including transport and other infrastructure, water, 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). It should be explained how the environmental values were derived (for example, by citing published documents or by following a recognised procedure to derive the values).
- 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 and recommendations 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.

Where impacts from the proposal will not be felt in isolation to other sources of impact, it is recommended that the proponent develop consultative arrangements with other industries in the proposal's area to undertake cooperative monitoring and/or management of environmental parameters. Such arrangements should be described in the EIS.

- 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, (for example 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 (for example, 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 terms of reference 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 5).

4.1 Land

4.1.1 Description of environmental values

This section describes the existing environment values of the land area that may be affected by the proposal. It should also define and describe the objectives and practical measures for protecting or enhancing land-based 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.

4.1.1.1 Topography/geomorphology

Maps should be provided locating the project 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 locality should be included on the maps. Such features would include any locations subsequently referred to in the EIS (for example, the nearest noise sensitive locations) that are not included on other maps in section 4.1. Commentary on the maps should be provided highlighting the significant topographical features.

4.1.1.2 Geology

The EIS should provide a description, map and a series of cross-sections 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. In locations where the age and type of geology is such that significant fossil specimens (such as of dinosaurs or their tracks) may be uncovered during construction/operations, the EIS should address the potential for significant finds.

The EIS should provide evidence of the salinity, sodicity, dispersivity and sulfide content of overburden. The EIS should also discuss the potential impacts of placement of material with any undesirable properties. The EIS should also describe the necessary mitigation measures, with particular focus on how they will be incorporated into mine planning via the EM Plan and Plan of Operations.

4.1.1.3 Mineral resources

The EIS should provide a summary of the results of studies and surveys undertaken to identify and delineate the mineral resources within the project area (including any areas underlying related infrastructure).

The location, tonnage and quality of the mineral resources within the project area should be described in detail as indicated below and, for coal projects, where possible it should be presented on a 'seam by seam' basis and include the modifying factors and assumptions made in arriving at the estimates. The mineral resources should be estimated and reported in accordance with the *'Australasian Code for Reporting of Mineral Resources and Ore Reserves'* (the JORC Code - available at www.jorc.org/main.php) and the principles outlined in the *'Australian Guidelines for the Estimating and Reporting of Inventory Coal, Coal Resources and Coal Reserves'* (available at www.jorc.org/pdf/coalguidelines.pdf) as appropriate.

In addition, maps (at appropriate scales) should be provided showing the general location of the project area, and in particular:

- the location and areal extent of the mineral resources to be developed or mined;
- the location and boundaries of mining tenures, granted or proposed, to which the project area is, or will be subject;
- the location of the proposed mine excavation(s);
- the location and boundaries of any project sites;
- the location and boundaries of any other features that will result from the proposed mining including waste/spoil dumps, water storage facilities and other infrastructure;
- the location of any proposed buffers, surrounding the working areas; and
- 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 EIS should analyse the effectiveness of the mining proposal in achieving the optimum utilisation of the coal/mineral resources within the project area and consider its impacts on other resources. 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 of these or any other of the State's coal, mineral, and petroleum (including gas and coal seam methane) resources that may be impacted upon or sterilised by the mining activities or related infrastructure.

4.1.1.4 Soils

Soil surveys of the project sites should be conducted with particular reference to the physical and chemical properties of the materials which will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land (for example, for dry-land cropping, irrigated cropping or grazing uses). Information should also be provided on soil stability and suitability for construction of all project 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 on the extent of Good Quality Agricultural Land should be presented in accordance with the *Planning Guidelines - The Identification of Good Quality Agricultural Land* that support State Planning Policy 1/92.

The requirement for soils mapping in terms of area and mapping scale should follow the QDME *Technical Guidelines for Environmental Management of Exploration and Mining in Queensland*, 1995, specifically section 6.1 which is headed Land Suitability Assessment Techniques. These guidelines recommend that disturbed areas be mapped more intensively than non-disturbed areas and provide guidance on acceptable mapping scale and site intensity.

4.1.1.5 Land use

The EIS should provide a description of current land tenures 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 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.

Describe the land use suitabilities of the affected area in terms of the physical and economic attributes. The assessment should set out soil and landform subclasses assigned to soil mapping units in order to derive land suitability classes. The limitations and land suitability classification system to use includes the land suitability assessment techniques in the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (1995).

Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses, for example, grazing of native and improved pastures and horticulture. Land classified as good quality agricultural land in the Department of Natural Resources' land classification system is to be shown in accordance with the planning guideline, *The Identification of Good Quality Agricultural Land*, which supports State Planning Policy 1/92.

4.1.1.6 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 on maps of a suitable scale. Indicate locations of gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this infrastructure. In the case of the built environment such as roads, environmental values affected by the project should be interpreted to mean the current road characteristics such as width or road condition. Establishing this "environmental value" or current condition will then serve as a datum against which project impacts can be measured and mitigated.

4.1.1.7 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, of concern and endangered regional ecosystems, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates and sites covered by international treaties or agreements, areas of cultural significance and scientific reserves (see section 4.7 for further guidance on sensitive areas).

The Commonwealth's EPBC Act should be addressed as required in section 4.7.3.

The proximity of the proposal elements to any of these areas should be identified.

4.1.1.8 Landscape character

This section should describe in general terms the existing character of the landscape that will be affected by the proposal. It should comment on any changes that have already been made to the natural landscape since European settlement. It should 'set the scene' for the description of particular scenic values in the following section on visual amenity. The difference being that this section describes the general impression of the landscape that would be obtained while travelling through and around it, while the visual amenity section addresses particular panoramas and views (for example, from constructed lookouts, designated scenic routes, etc.) that have amenity value.

4.1.1.9 Visual amenity

This section should describe existing landscape features, panoramas and views that have, or could be expected to have, value to the community whether of local, regional, State-wide, national or international significance. Information in the form of maps, sections, elevations and photographs is to be used, particularly where addressing the following issues:

- identification of elements within the proposal and surrounding area that contribute to their image of the town as discussed in the any local government strategic plan - 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.

4.1.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing the land-based environmental values identified through the studies outlined in the previous section. It should describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.1.2.1 Land use suitability

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 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 suitability prior to the proposal and minimising potential liabilities for long-term management.

The potential environmental harm caused by the proposal on the adjacent areas currently used for agriculture and the implications of the proposal for future developments in the impact area including constraints on surrounding land uses should be described.

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 guideline, *The Identification of Good Quality Agricultural Land*, which supports State Planning Policy 1/92.

Potential impacts of the project on the Quarry Reserve in terms of potential impacts on the gazetted purpose of the Reserve and secondary tenure arrangements should be discussed, together with proposed alternative arrangements for persons or bodies affected

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.

Post mining land use options need to be assessed as per Tables 1 and 2 (Suitability for Rainfed Broad acre Cropping/Suitability for Beef Cattle Grazing) of Land Suitability Assessment Techniques of *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* (1995).

4.1.2.2 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, 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.

The diversion of Suttor Creek will be assessed through a separate process involving an application to amend the current environmental authority.

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 description of topsoil management should also outline how the utilisation of soil suitable for rehabilitation purposes will be maximised. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed. Erosion and sediment control should be described, particularly in relation to the management of sodic and saline overburden material (also see section 4.1.2.4).

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

If geological conditions are conducive, the proponent should consider the possibility that significant fossil specimens (such as of dinosaurs or their tracks) may be uncovered during construction/operations and propose strategies for protecting the specimens and alerting the Queensland Museum to the find.

4.1.2.3 Land contamination

The EIS should describe the possible contamination of land from aspects of the proposals such as chemical and fuel storage facilities. The EIS should investigate the potential for reject or tailings to generate acid and the potential for saline impacts from mining activities.

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 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 PSI 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. The *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* can be downloaded from the EPA website at: www.epa.qld.gov.au/environment/business/contaminated). Proponents should refer study proposals to the EPA for review prior to commencement (Consult with the Contaminated Land Section in the Queensland EPA).

4.1.2.4 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:

- 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.

4.1.2.5 Landscape character

Describe the potential impacts of the project landscape character of the site and the surrounding area. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing.

Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.

4.1.2.6 Visual amenity

This section should analyse and discuss the visual impact of the proposal on particular panoramas and outlooks. It should be written in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, 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. The assessment is to address the visual impacts of the project structures and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos are to 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 places of residence or work, which are within the line-of-sight of the project.

Detail should be provided of all management options to be implemented and how these will mitigate or avoid the identified impacts.

4.1.2.7 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.

4.1.2.8 Transport

The EIS should investigate whether the rail network and state-controlled and local government road networks will be affected by the project. The impact on stakeholders including state agencies, statutory bodies and the community along the whole route should be investigated and descriptions provided of how any impacts will be managed. The proponent should use Main Roads' *"Guidelines for Assessment of Road Impacts of Development Proposals"* to assess project impacts on state-controlled or future state-controlled roads in consultation with the Townsville district office. This document is available on the Main Roads' website: www.mainroads.qld.gov.au. For roads, options such as preparing a traffic management plan to formalise agreed strategies for mitigating any significant project impacts on transport should be considered.

Details should be provided of the impacts on environmental values of any new roads or road realignments.

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 investigate transport issues associated with the project and describe any potential impacts on existing or proposed pedestrian and cycle networks.

4.2 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 (for example, temperature inversions) that may affect air quality within the region 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 4.1. The impacts of storm events on the capacity of waste containment systems (that is, site bunding/stormwater management and tailings dams) should be addressed in section 4.3 with regard to contamination of waterways and in section 4.5 with regard to the design of waste containment systems. The impacts of winds, rain, humidity and temperature inversions on air quality should be addressed in section 4.4.

4.3 Water resources

4.3.1 Description of environmental values

This section describes the existing environment for water resources, which may be affected by the proposal, in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994*, *Environmental Protection (Water) Policy 1997* and ANZECC 2000 guidelines.

Where a licence or permit will be required under *the Water Act 2000* to take or interfere with the flow of water, this section of the EIS should provide sufficient information for a decision to be made on the application.

4.3.1.1 Surface waterways

A description should be given of the surface water courses 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, history of flooding 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, including historically high water levels where data permits.

The EIS should provide a description, with photographic evidence, of the geomorphic condition of any watercourses likely to be affected by disturbance or stream diversion. The results of this description should form the basis for the planning and subsequent monitoring of rehabilitation of the watercourses during or after the operation of the proposal.

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the proposal. The basis for this assessment should be a monitoring program with sampling stations located upstream and downstream of the proposal. 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 measured to gauge the environmental harm on any affected creek or wetland system.

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

- values identified in the *Environmental Protection (Water) Policy*;
- 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.

4.3.1.2 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 survey 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;
- seasonal variations (if records exist) of groundwater levels;
- water quality; and
- existing groundwater entitlements through licenses under the *Water Act 2000*.

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;
 - possible sources of recharge; and
 - vulnerability to pollution.

The data obtained from the groundwater survey 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*;
- sustainability, including both quality and quantity; and
- physical integrity, fluvial processes and morphology of groundwater resources.

4.3.2 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*.

Water management controls should be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of

nearby surface and groundwater. As noted previously, the diversion of Suttor Creek will be assessed through a separate process involving an application to amend the current environmental authority.

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).

Consider the risks of uncontrolled emissions to water due to system or catastrophic failure and describe the strategies to prevent, minimise and contain impacts.

4.3.2.1 Surface water and water courses

The potential environmental harm to the flow and the quality of surface waters 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 any in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered.

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, the technology for settling suspended clays 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, weirs or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (storm events, floods and droughts) on the capacity of the dams to retain contaminants; the structural integrity of the containing walls; and the quality of water contained; 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) under the *Water Act 2000* should be discussed. Water allocation and water sources should be established in consultation with Department of Natural Resources and Mines. A dam failure impact assessment should be carried out for any proposed dams as required under the *Water Act 2000*. Reference to the Moratorium Notice for the *Draft Water Resource (Burdekin Basin) Plan* should be made with discussion of the proposed development in the context of the Moratorium Notice. The notice and amendment are available at http://nrm.qld.gov.au/wrp/burdekin_pnotice.html.

Having regard for the requirements of the *Environmental Protection (Water) Policy*, 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.

The Australian and New Zealand Environment and Conservation Council's (ANZECC, 2000) '*National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters*' 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.

4.3.2.2 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 groundwater 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.

The impact of the groundwater drawdown on local vegetation should be discussed.

4.4 Air

4.4.1 Description of environmental values

A description of the existing air shed environment should be provided having regard for particulates. The background levels and sources of suspended particulates and any other major constituent of the air environment which may be affected by the proposal should be discussed.

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms within the air shed. Parameters should include air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input to the models.

4.4.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing 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 (ambient and ground level concentrations), relevant emission guidelines, and any relevant legislation, and the particulate emissions modelled using a recognised atmospheric dispersion model.

The proposed levels of emissions should be compared with the national environmental protection measures (NEPM) for ambient air quality (1998), the National Health Medical Research Council (NHMRC) national guidelines (1985) for control of emissions from stationary sources, and the *Environmental Protection (Air) Policy (1998)*.

The EIS should describe if residential towns, industrial and agricultural developments could be sensitive to the effects of the predicted emissions. The EIS should also discuss the likely impact of air emissions on nearby vegetation and biodiversity. Ground level predictions should be made at any rural residence in close proximity to the project. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained. The air quality assessment should consider:

- the limitations and accuracy of the applied atmospheric dispersion models should be discussed. The air quality modelling results should be discussed in light of the limitations and accuracy of the applied models.
- air quality predictions should be compared to the relevant goals in the National Environmental Protection Council (Ambient Air Quality) Measure and the *Environmental Protection (Air) Policy 1998* goals.
- air shed management and the contribution of the proposal to air shed capacity in view of existing and future users of the air shed for assimilation and dispersion of emissions.

4.5 Waste

This section should complement other sections of section 4 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.

4.5.1 Description of environmental values

This section describes the existing environment values that may be affected by the project's wastes. Refer to each of the waste streams described in section 3.6 and provide references to environmental values described in other sections of section 4 of the EIS.

4.5.2 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 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;
- waste minimisation techniques processes proposed; and
- decommissioning of the site.

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

4.6 Noise and vibration

4.6.1 Description of environmental values

This section describes the existing environment values that may be affected by noise and vibration from the proposal.

If the proposed activity could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of sensitive sites affected by the proposal. Noise sensitive places are defined in the *Environmental Protection (Noise) Policy 1997*. Long-term measured background noise levels that take into account seasonal variations are required. 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 should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the night. Monitoring methods should adhere to relevant EPA 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.).

4.6.2 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, 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 terrestrial 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 EIS should also discuss the likely impact of noise emissions on fauna in nearby areas. The magnitude, duration and frequency of any vibration should be discussed. Measures to prevent or minimise environmental harm, including nuisance, should be discussed.

4.7 Nature conservation

4.7.1 Description of environmental values

This section describes the existing environment values for nature conservation that may be affected by the proposal. It should address any actions of the project that require an approval under the *Nature Conservation Act 1992*, and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*.

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, 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 (see the draft *Regional Nature Conservation Strategy for South East Queensland 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 include 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 1999* 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.

The EPA should be consulted on the scope of any biological studies before they are undertaken.

4.7.1.1 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 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 including its listing under State and Commonwealth legislation.

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. Adjacent areas may also require mapping.

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

- location and extent of vegetation types, including advanced regrowth, using the EPA's regional ecosystem type descriptions in accordance with the Regional Ecosystem Description Database (REDD), available at the EPA's website http://www.epa.qld.gov.au/nature_conservation/biodiversity/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.

Within each defined (standard system) vegetation community, a minimum of three sites (numbers should be discussed with the EPA) should be surveyed for plant species, preferably in both summer and winter, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database;
- the minimum site size should be 10 by 50 metres;

- a complete list of species present at each site should be recorded;
- the relative abundance of plant species present should be recorded;
- any plant species of conservation, cultural, commercial or recreational significance should be identified; and
- specimens of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

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 methodology. Methodology used for flora surveys should be specified in the appendices to the report.

4.7.1.2 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 (that is, a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that 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 (for example, any requirements of protected area management plans);
- targeted surveys for particular species if necessary;
- EPBC listed species; 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.

4.7.1.3 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.

4.7.2 Potential impacts and mitigation measures

This section defines and describes the objectives and 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 EIS should address any actions of the project or likely impacts that require an authority under the *Nature Conservation Act 1992*, and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*.

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

Strategies for protecting any rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (Japan and Australia Migratory Bird Agreement (JAMBA), China and Australia Migratory Bird Agreement (CAMBA)) should be discussed. Emphasis should be given to potential environmental harm to benthic and intertidal communities, seagrass beds and mangroves.

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 impacts 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 harms on riparian vegetation or other sensitive vegetation communities. A monitoring program and measures to mitigate the environmental harm to habitat and remaining endangered ecosystems, or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described.

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

Weed management strategies aimed at containing existing weed species (that is, parthenium and other declared plants) and ensuring no new declared plants are introduced to the area are required, and feral animal management strategies should be addressed. Weed control strategies will need to include specific components relating to wash down procedures, education of on-site staff and reporting mechanisms during construction and operational phases. This may be included in the pest management plan as part of the overall environmental management plan for the project. 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. The strategies for both flora and fauna should be discussed in the main body of the EIS and provided in a working form in a pest management plan as part of the overall environmental management plan for the project.

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

The following information is required in relation to the areas proposed to be cleared:

- area of remnant vegetation listed by regional ecosystem on both freehold and leasehold land; and
- area of non-remnant vegetation on leasehold land.

The EIS should outline best practise mitigation measures, taking into consideration the *Regional Vegetation Management Code for Ongoing Clearing Purposes Nebo-Broadsound (Brigalow Belt Bioregion)*.

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 EPBC Act as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems recognised by the EPA as 'endangered' or 'of concern' and/or ecosystems listed as presumed extinct, endangered or vulnerable under the Commonwealth EPBC Act;

- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites containing near threatened or bio-regionally significant or EPBC-listed species or essential, viable habitat for near threatened or bio-regionally significant or EPBC-listed 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 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, for example, 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: riparian vegetation and 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*.

4.7.3 Matters of National Environmental Significance

A section of the Wollombi surface area (approximately 404ha) contains two endangered regional ecosystems (ERE) under the *Vegetation Management Act 1999*. These are also listed threatened ecological communities under Part 3 of the EPBC Act.

Consideration should be given to mitigating the impacts on the Brigalow community by any or all of the following:

- a compensatory land agreement to provide more area of similar, or potentially superior ERE than affected by the project;
- maximising retention of the ecological communities through detailed mine planning;
- re-establishment and confirmation of biodiversity values in the rehabilitated areas of the mined ecological communities;
- additional site specific studies; and
- the development of management strategies for target species

4.8 Cultural heritage

4.8.1 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.

A cultural heritage study may be required that will describe indigenous and non-indigenous cultural heritage sites and places, and their values. Any such 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.

4.8.2 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 the lead agency, the Department of Natural Resources and Mines, and all stakeholder representatives, and where there is a role or responsibility identified

for the EPA, such as managing the EIS process under the *Environmental Protection Act 1994*, it should be party to the discussions.

Any collection of artefact material as part of a mitigation strategy will need to be done by an appropriately qualified cultural heritage practitioner holding a permit under provisions of the *Aboriginal Cultural Heritage Act 2003*. The EPA regional manager should be consulted for the provision of general advice including the appropriate conduct of cultural heritage surveys and the necessary permits.

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

4.9 Social

4.9.1 Description of environmental values

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

The social 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 also 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.

4.9.2 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.

Attention should be paid to:

- impacts on demographic, social, cultural and economic profiles;
- impacts on local residents, current land uses and existing lifestyles and enterprises;
- impacts on local residents' values and aspirations; and

- impacts on the ability of social infrastructure, such as health and education facilities, to meet the community's needs.

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 EIS should describe changes to the existing workforce and any additional accommodation, community infrastructure or community services that are required as a result of the project.

In particular, the EIS should address the following items regarding workforce numbers to be employed during various phases of the development:

a) Construction workforce.

Estimates are to be provided of the number of workers to be employed on-site during the construction stage, including the number of sub-contractors.

An outline of recruitment schedules and policies for recruitment of workers (addressing recruitment of local and non-local workers) should be included.

A schedule should be provided for the construction phase of the project, showing the estimated number of construction workers and sub-contractors employed on-site at various stages of the project's construction. This information should show anticipated peaks in worker numbers during the construction period.

b) Commissioning and operational phase workforce.

Estimates are to be provided of the total number of workers to be employed on-site during the commissioning and operational stages of the project, including the number of workers employed in the current mining operation.

An outline of recruitment schedules and policies for recruitment of workers (addressing recruitment of local and non-local workers) should be included.

A schedule should be provided for the operational phase of the project, showing the estimated total number of workers employed on-site. This information should also show any overlap in worker numbers employed in on-going construction during this period, as well as the number of workers employed in the current mine operation.

This information should include an estimate of the anticipated numbers of workers who will be accompanied by dependents, as well as those who will be unaccompanied (that is, single workers).

With respect to accommodation of workers, the EIS should provide:

- an estimate of the number of additional employees that will be housed in the existing facilities;
- an estimate of the number of new workers who will be accompanied by dependents;
- a description of the existing facilities, and the circumstances of workers currently occupying the accommodation (that is, single or accompanied);
- the spare capacity of the existing facilities and their suitability for housing the new workforce; and
- details of the tenure of the existing facilities (that is, whether exclusively owned or managed by the proponent or by another private organisation).
- the size of the private rental market in the catchment area, including caravan parks, backpacker hostels, hotel and motel accommodation;
- the current vacancy rate of rental accommodation, including assessment of seasonal fluctuations;
- the availability and median cost of housing for purchase in the catchment area;

- any identified constraints and opportunities for new housing construction in the catchment area, including the capacity of the local land development and housing construction industries to provide new housing.

The EIS should discuss alternative options for action if the existing housing stock in Glenden subsequently proves to be inadequate for meeting the predicted level of housing demand caused by the proposed coal mining operations.

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.

4.10 Health and safety

4.10.1 Description of environmental values

This section describes the existing community values for public health and safety that may be affected by the proposal. For projects proposing air emissions, and/or those with the potential to emit odours, nearby and other potentially affected populations should be identified and described. Particular attention should be paid to those sections of the population, such as children and the elderly, that are especially sensitive to environmental health factors.

4.10.2 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. 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.

The EIS should specify existing systems used at Newlands Coal and to be adopted at Wollombi to manage the 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.

Map(s) should be provided showing the locations of sensitive receptors, such as, but not limited to, kindergartens, schools, hospitals, aged care facilities, residential areas, and centres of work (for example, office buildings, factories and workshops). The EIS, illustrated by the maps, should discuss how planned discharges from the project could impact on public health in the short and long term, and should include an assessment of the cumulative impacts on public health values caused by the proposal, either in isolation or by combination with other known existing or planned sources of contamination.

The EIS should address the project's potential for providing disease vectors. Measures to control mosquito and biting midge breeding should be described. Any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion (via use on food crops). Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals.

Practical monitoring regimes should also be recommended in this section.

4.11 Economy

4.11.1 Description of environmental values

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

- economic viability, including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc.;
- historical descriptions of large-scale resource developments and their effects in the region;

The catchment area for the mine is considered to be the towns in the region where the construction and operational workforces are likely to seek off-site accommodation. As a guide, this catchment area could be identified by reference to the residential patterns of the mine's current workforce.

4.11.2 Potential impacts and mitigation measures

The EIS should describe the new skills and training required. Apprenticeship and worker training schemes should be described, as provided as part of the Newlands Coal Mine.

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.

Attention should be directed to the long and short-term effects of the project on the land-use of the surrounding area, regional income and employment and the state economy.

4.12 Hazard and risk

4.12.1 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.

4.12.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting people and places from hazards and risk, describes 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.

The EIS should provide an inventory for each class of substances listed in the Australian Dangerous Goods Codes to be held on-site. This information should be presented by classes and should contain:

- chemical name;
- concentration in raw material chemicals;
- concentration in operation storage tank;
- U.N. number;
- packaging group;
- correct shipping name; and
- maximum inventory of each substance ;

Details should be provided of:

- safeguards proposed on the transport, storage, use, handling and on-site movement of the materials to be stored on-site;
- the capacity and standard of bunds to be provided around the storage tanks for classified dangerous goods and other goods likely to adversely impact upon the environment in the event of an accident; and
- the procedures to prevent spillages, and the emergency plans to manage hazardous situations.

The proponent should develop an integrated risk management plan for the whole of the life of the project including construction, operation and decommissioning phases, or amend the Newlands Coal plan to include the project. The plan should include a preliminary hazard analysis (PHA), conducted in accordance with appropriate guidelines for hazard analysis (for example, HAZOP Guidelines, NSW Department of Urban Affairs and Planning (DUAP)). The assessment should outline the implications for and the impact on the surrounding land uses, and should involve consultation with Department of Emergency Services, Queensland Fire and Rescue Authority, and Queensland Ambulance Service. The preliminary hazard analysis should incorporate:

- all relevant majors hazards both technological and natural;
- the possible frequency of potential hazards, accidents, spillages and abnormal events occurring;
- indication of cumulative risk levels to surrounding land uses;
- life of any identified hazards;
- a list of all hazardous substances to be used, stored, processed, produced or transported;
- the rate of usage;
- description of processes, type of the machinery and equipment used;
- potential wildlife hazards such as crocodiles, snakes, and disease vectors; and
- public liability of the State for private infrastructure and visitors on public land.

The plan should include the following components:

- operational hazard analysis;
- regular hazard audits;
- fire safety, emergency;
- response plans;
- qualitative risk assessment; and
- construction safety.

Where relevant, each of these components should be prepared in accordance with the relevant NSW DUAP Hazardous Industry Planning Advisory Paper (HIPAP).

4.13 Cross-reference with the 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 terms of reference.

5. Environmental management plan

The environmental management plan (EM Plan) should be developed from the mitigation measures detailed in the EIS. Its purpose is to set out the proponents' commitments to environmental management. That is, how environmental values will be protected and enhanced.

The EM Plan is an integral part of 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 EM Plan should comprise:

- the proponents' commitments to acceptable levels of environmental performance, including environmental objectives (that is, levels of expected environmental harm), performance standards and associated measurable indicators, performance monitoring and reporting;
- impact prevention or mitigation actions to implement the commitments; and
- corrective actions to rectify any deviation from performance standards.

Through the EM Plan, the EIS's commitments to environmental performance can be used as regulatory controls through conditions to comply with those commitments. Therefore, the EM Plan is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them.

For further information, see the EPA guideline "*Preparing environmental management plans*".

6. References

All references consulted should be presented in the EIS in a recognised format.

7. Recommended appendices

A1. Final terms of reference for this EIS

A copy of the final terms of reference 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 terms of reference 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 terms of reference to the relevant section of the EIS, should also be provided. For this purpose the terms of reference should be line numbered.

A2. The standard criteria

A brief summary of the proposal's compatibility with ESD policy and other relevant policy instruments such as the standard criteria as defined by the *Environmental Protection Act* (Qld) should be presented. 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.

A3. Study team

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

A4. Specialist studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- geology;
- soil survey and land suitability studies;
- waterway hydrology;
- groundwater;
- flora and fauna studies;
- economic studies, CBA; and
- hazard and risk studies.

A5. Consultation report

This appendix should provide a Consultation Report, which should summarise:

- the results of the community consultation program;
- the referral agencies, groups and individuals consulted;
- the issues raised; and
- how the issues raised were addressed.

The discussion should include the methodology used in the community consultation program including criteria for identifying stakeholders (for example, 'affected persons') and the communication methods used.

A6. Research

This appendix should outline any proposals for researching alternative environmental management strategies or for obtaining any further necessary information.

Disclaimer:

While this document has been prepared with care it contains general information and does not profess to offer legal, professional or commercial advice. The Queensland Government accepts no liability for any external decisions or actions taken on the basis of this document. Persons external to the Environmental Protection Agency should satisfy themselves independently and by consulting their own professional advisors before embarking on any proposed course of action.

8. Approved by

Signed by D Ellwood

Signature

Dean Ellwood
Director, Integrated Assessment Branch
Environmental Operations
Environmental Protection Agency

14 July 2005

Date

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