

NEW ACLAND COAL MINE STAGE 3 EXPANSION PROJECT

TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT

**UNDER PART (4) OF THE QUEENSLAND STATE DEVELOPMENT AND
PUBLIC WORKS ORGANISATION ACT 1971**

October 2007

PREAMBLE

Project Proponent

New Acland Coal Pty Ltd (NAC, 'the Proponent') owns and operates the New Acland Coal Mine, an open cut coal mine that is located within the Rosalie Shire on the Darling Downs. The mine is located approximately 14km north-northwest of Oakey and 35km north-west of Toowoomba City.

NAC is a wholly-owned subsidiary of New Hope Corporation Limited (NHCL), a company listed on the Australian Stock Exchange with a current market capitalisation of approximately \$1.6 billion.

Trading under the business name of New Hope Coal Australia, NHCL also operates the New Oakleigh open cut coal mine near Ipswich. NHCL's other interests include coal seam methane gas production, port operations and real estate.

NHCL acquired the Acland thermal coal resource from Shell Coal Australia Ltd in December 1999. Stage 1 open cut mining operations commenced in 2002 at a production rate of approximately 2.5 million tonnes per annum (Mtpa). During March 2007, the Stage 2 expansion commenced increasing coal production to approximately 4Mtpa. Mine output is currently transported by rail to the Port of Brisbane for export or by road and rail to other domestic markets in southeast Queensland and northern New South Wales. NAC currently supplies a small quantity of coal to the Tarong Power Stations, under a coal supply agreement with Tarong Energy Corporation, operators of the power stations.

Project Summary

NAC proposes to develop the New Acland Coal Mine Stage 3 Expansion Project ("the Project") to increase production to 10Mtpa of saleable coal for the domestic and export markets, over a mine life of approximately 25-30 years.

NAC is seeking to progressively increase coal production to expand its domestic and export thermal coal market share and secure a reliable coal supply for a possible future alternative fuels project.

The Project involves the expansion of the existing New Acland Coal Mine and associated infrastructure, including coal handling and transportation facilities and power and water supply.

The New Acland coal deposit, a high quality thermal coal resource with total reserves of approximately 230 million tonnes, is contained within the Walloon Coal Measures in the Clarence-Moreton Basin. The deposit is contained within NAC's mineral development licence (MDL) 244. Mining operations are currently limited to the Glen Roslyn Deposit – North, South and Centre Pits within mining leases (MLs) 50170 and 50216. The Project will require an additional mining lease to the south and west of these leases, within the existing boundary of MDL 244 (ML Application 50232).

The Project will involve the staged development of two new pits: the Manningvale and Sabine/Willeroo Pits, using the conventional open cut truck/shovel operation as employed in Stages 1 and 2. The current mine plan provides for the initial development of the Manningvale Pit followed by the later concurrent development of the Sabine/Willeroo Pits.

The Project's on-site infrastructure includes:

- Coal handling and preparation plant.
- Tailings storage facility.
- Environmental dams and other water management structures (including diversion drains).
- Offices, including administration, lunch room, bath house.
- Upgrading and construction of additional sewage treatment and potable water treatment plants.
- Workshops, warehouse, fuel farm, wash bays, tyre handling and equipment lay down pads.

Other key infrastructure requirements to be assessed as part of the Project include:

- Investigations to examine power network/grid supply specifically looking at the issues of upgrade requirements, alternative supply arrangements, reliability of supply and the required changes to the internal distribution network.
- The possible diversion of the current coal haul route, the Jondaryan-Muldu Road, to accommodate the Project. The current coal haul route passes directly over the proposed Manningvale Pit, a road controlled by the Rosalie Shire Council.
- The possible construction of a conveyor to carry coal to mine's rail siding and coal loading facility near Jondaryan (i.e. based on the results of a feasibility study).
- The possible construction of a new pipeline to carry waste water from Toowoomba. NAC is not planning to permanently increase its groundwater use from the Great Artesian Basin for the Project, primarily due to the lack of available reserves. NAC is negotiating with Toowoomba City Council to take 3,000 megalitres per annum (MLpa) from the Wetalla Waste Water Treatment Plant (currently 11,000MLpa is generated) for at least 25 years to meet the mine's future water requirements.

Further details of the Project are available in the Initial Advice Statement (IAS), a copy of which can be downloaded from the Department of Infrastructure and Planning's website at:

http://www.infrastructure.qld.gov.au/major_projects/acland_coal_stage3.shtm

Administrative Procedures for these Terms of Reference

On 9 May 2007, the Coordinator-General (CG) declared the New Acland Coal Mine Stage 3 Expansion ('the Project') a 'significant project', for which an Environmental Impact Statement (EIS) is required pursuant to section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). Matters considered by the CG in making this declaration included information in the IAS prepared by NAC; relevant planning schemes and policy frameworks; infrastructure impacts; employment opportunities; environmental effects; complexity

of local, State and Commonwealth requirements; level of investment; and the project's strategic significance.

The declaration initiates the statutory environmental impact assessment procedure under Part 4 of the SDPWO Act, which requires the Proponent to prepare an EIS for the Project.

On 23 April 2007, the Proponent referred the Project to the Australian Government Minister for the Environment and Water Resources for a decision as to whether the Project constitutes a controlled action under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Referral No. 2007/3423). On 24 May 2007, the Minister determined that the proposal constitutes a 'controlled action' under section 75 of the Act, as there is likely to be a significant impact on matters of 'national environmental significance'. The controlling provisions under Part 3, Division 1 of the EPBC Act are: sections 18 and 18A (listed threatened species and communities).

As a consequence, the Project requires assessment and approval under the EPBC Act. The Australian Government has accredited the EIS process under the SDPWO Act under a bilateral agreement between the Australian and Queensland Governments, pursuant to section 87(1)(a) of the EPBC Act. This will enable the EIS to meet the impact assessment requirements under both the Australian and Queensland legislation.

The Department of Infrastructure and Planning (DIP) is managing the EIS process on behalf of the CG. DIP has invited relevant Australian, State and local government representatives and other relevant authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment process is the development of Terms of Reference (ToR) for an EIS for the Project to satisfy the requirements of the SDPWO Act. The process involves the formulation of Draft ToR that are made available for public and Agency comment. The CG has regard to all properly made submissions received on the draft ToR in finalising the ToR, which will be presented to the Proponent.

This document represents the Draft ToR for public and Agency comment.

NAC will prepare an EIS to address the final ToR. Once the EIS has been prepared to the satisfaction of the CG, a public notice will be placed in relevant newspapers. The notice will state: where copies of the EIS are available for inspection and how it can be purchased; that submissions may be made to the CG about the EIS; and the submission period.

NAC will be required to prepare a Supplementary EIS to address specific matters raised in submissions on the EIS. The CG will then prepare a report evaluating the EIS. The CG's Report will be provided to NAC, the Minister for the Environment and Water Resources (under the EPBC Act) and be publicly notified by placing it on DIP's website.

To undertake the mining components of the Project, NAC will require both a mining lease under the *Mineral Resources Act 1989* (MRA) issued by the Queensland Governor in Council and an environmental authority (mining activities) under the *Environmental Protection Act 1994* (EP Act) issued by the Queensland Minister for the Environment. Some elements of the Project outside

the mining leases may require development approval under the *Integrated Planning Act 1997* (IPA). In this case, the assessment manager for any such development applications would likely be the relevant local government authority.

Consequently, the abbreviation 'EIS' used in these ToR should be interpreted as satisfying the impact assessment requirements of all relevant Queensland and Australian Government statutes for the Project, which include, but are not limited to, the SDPWO Act, EPBC Act, EP Act, MRA, IPA and *Transport Infrastructure Act 1994*.

Under s.45 of SDPWO Act, the CG's Report may state conditions for the proposed mining lease. If CG's conditions are included in the Report:

- the CG must give the MRA Minister a copy of the report; and
- the conditions of the proposed mining lease are, subject to any inconsistency with native title issues conditions that have paramountcy under s.47 of SDPWO Act, taken to include the CG's conditions.

Similarly, the CG's Report may, under s.49 of SDPWO Act, state conditions for any draft environmental authority under the EP Act for the proposed environmental authority (mining lease). If conditions are included in the Report:

- the CG must give the EP Act Minister a copy of the Report.

Finally, if the Project involves development requiring an application for a development approval under IPA, the CG's Report may, under s.39 of SDPWO Act, state for the assessment manager one or more of the following:

- the conditions that must attach to the development approval;
- that the development approval must be for part only of the development; and/or
- that the approval must be preliminary approval only.

Alternatively the Report must state for the assessment manager:

- that there are no conditions or requirements for the Project; or
- that the application for development approval be refused.

Further, the Report must:

- give reasons, if the Report states that development approval be refused; and
- be given to the assessment manager for the application by the CG.

Results of Consultation on these Terms of Reference

On 21 July 2007, advertisements were placed in the following newspapers inviting public comment on the Project's draft ToR: *The Courier Mail*, *The Weekend Australian* and *The Toowoomba Chronicle*. A similar notice was placed on the Department of Infrastructure and Planning's website. Hard copies of the draft ToR were also publicly available for inspection from the offices of Toowoomba City Council and Rosalie and Jondaryan Shire Councils from 23 July 2007.

The period for receipt of submissions closed on 20 August 2007. A total of 15 written submissions were received, including fourteen (14) from Queensland Government agencies, and one (1) from a private individual. Copies of all submissions were forwarded to the Proponent.

The content of all submissions has been reviewed and considered by the CG in finalising the ToR for the EIS for the Project.

The following is a list of responses and submissions received on the draft ToR:

No.	Agency/Organisations/Individuals	Date	Abbrev
1	Dept of Emergency Services	07/08/07	DES
2	Dept of Housing	10/08/07	DOH
3	Dept of Mines & Energy*	16/08/07	DME
4	Dept of Primary Industries & Fisheries	17/08/07	DPIF
5	Dept of Main Roads	17/08/07	DMR
6	Acland Resident	17/08/07	Resident
7	Dept of Communities	20/08/07	DOC
8	Environmental Protection Agency	20/08/07	EPA
9	Dept of Natural Resources and Water	20/08/07	NRW
10	Dept of Local Government Planning Sport & Recreation	21/08/07	DLGPSR
11	Queensland Transport	21/08/07	DOT
12	Queensland Health*	22/08/07	QH
13	Dept of the Premier & Cabinet	27/08/07	DPC
14	Dept of Education and the Arts*	07/09/07	DEA
15	Queensland Treasury*	10/09/07	QT

* Note: these government agencies indicated that they did not have any comments on the Draft ToR for the Project

The ToR provides information in two broad categories:

- Part A – Information and advice on the preparation of the EIS.
- Part B – Specific requirements – Content of the EIS.

The Coordinator-General's contact details for any further enquiries are:

EIS Project Manager

New Acland Coal Mine Stage 3 Expansion Project

Major Projects Division

Department of Infrastructure and Planning

PO Box 15009

CITY EAST QLD 4002

Tel: (07) 3224 2911 Fax: (07) 3225 8282

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ABBREVIATIONS

The following abbreviations have been used in this document:

ACARP – Australian Coal Association Research Program

CG – the Coordinator-General of the State of Queensland

CHMP – Cultural Heritage Management Plan

CLR – Contaminated Land Register

DEW – the Australian Government Department of Environment and Water Resources

DME – the Queensland Department Mines and Energy

DMR – the Queensland Department of Main Roads

DNRW – the Queensland Department of Natural Resources and Water

DoI – the Queensland Department of Infrastructure

EIS – Environmental Impact Statement

EMP – Environmental Management Plan

EMR – Environmental Management Register

EP Act – *Environmental Protection Act 1994*

EPA – the Queensland Environmental Protection Agency

EPBC Act - *Environment Protection & Biodiversity Conservation Act 1999* (Cth)

EPP (Air) – Environmental Protection (Air) Policy 1997

EPP (Noise) – Environmental Protection (Noise) Policy 1997

EPP (Waste) – Environmental Protection (Waste) Policy 2000

EPP (Water) – Environmental Protection (Water) Policy 1997

IAS – Initial Advice Statement as defined by part 4 of the *State Development & Public Works Organisation Act 1971*

IPA – *Integrated Planning Act 1997*

ML – Mining Lease issued pursuant to the *Mineral Resources Act 1989*

MRA - *Mineral Resources Act 1989*

Mtpa – million tonnes per annum

MLpa – mega litres pre annum

NAC – New Acland Coal Pty Ltd

NEPM – National Environmental Protection Measures

NES – National Environmental Significance, as defined under the *Environment Protection & Biodiversity Conservation Act 1999* (Cth)

NTA – Native Title Agreement, under the *Native Title Act 1993* (Cth)

SDPWO Act – *State Development & Public Works Organisation Act 1971*

ToR – Terms of Reference as defined by Part 4 of the *State Development & Public Works Organisation Act 1971*

PART A — MAIN EIS GUIDELINES

1. INTRODUCTION

These Terms of Reference (ToR) are for an Environmental Impact Statement (EIS) for the New Acland Coal Mine Stage 3 Expansion (the 'Project'). The ToR have been prepared in accordance with the requirements of Sections 29 and 30 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

The objective of the ToR is to identify those matters that should to be addressed in the EIS for the Project that has been described in the Initial Advice Statement (IAS) and which was declared to be a 'significant project' by the CG on 9 May 2007. The Project has also been determined to be a 'controlled action' under the EPBC Act and the EIS will be conducted under the Bilateral Agreement between the Australian and Queensland Governments.

In order to clarify the nature and level of investigations that are envisaged in the ToR, the Proponent may consult further with relevant Government Bodies (known as Advisory Bodies), peak community interest organizations and groups as necessary during the preparation of the EIS to ensure that the ToR are addressed.

Culturally sensitive information should not be disclosed in the EIS or any associated documents and the disclosure of any such information should only be in accordance with the arrangements negotiated with the traditional custodians. Confidential information to be taken into consideration in making a decision on the EIS should be marked as such and included as a separate attachment to the main report.

An executive summary should be prepared and included in the EIS. It should be a separable document that can be a stand alone document.

2. EIS OBJECTIVES

The objective of the EIS is to ensure that all potential environmental, social and economic impacts of the Project are identified and assessed and, where possible, how adverse impacts would be avoided or mitigated. Direct, indirect and cumulative impacts must be fully examined and addressed. The Project, including selection of the site, should be based on sound environmental protection and management criteria.

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the Project and the management measures employed to mitigate residual impacts. The EIS documentation should provide:

- For interested persons and bodies: a basis for understanding the Project, prudent and feasible alternatives, affected environmental values, potential impacts that may occur and measures to be taken to mitigate potential adverse impacts.
- For groups or persons with rights or interests in the land: an outline of the potential effects of the Project on that land including access arrangements.

- For government agencies: a framework for decision-makers to assess the environmental aspects of the Project with respect to legislative and policy provisions and based on that information to make an informed decision on whether the Project should proceed or not and if so, under what conditions, if any.
- For the Australian Government Minister for the Environment and Water Resources: information to determine the extent of potential impacts of the Project on matters of national environmental significance, in particular the controlling provisions under the EPBC Act: listed threatened species and communities (sections 18 and 18A).
- For the Proponent: a mechanism by which the potential environmental impacts of the Project are identified and understood. Information to support the development of management measures including an Environmental Management Plan (EMP), to mitigate the adverse effects of residual environmental impacts of the development.

The Proponent is required to address the ToR to the satisfaction of the CG before the EIS is made publicly available. It should be noted that the CG does not evaluate the EIS until public notification is completed and the CG has obtained any other material that the CG considers relevant to the Project, including additional information or comment about the EIS and the Project from the Proponent.

Completion of the EIS to the final ToR does not mean that the Project will necessarily be approved.

3. GENERAL EIS GUIDELINES

The EIS is to provide stakeholders with sufficient information to understand the type and nature of the Project, the potential environmental, social and economic impacts and the measures proposed by the Proponent to mitigate all adverse residual impacts on the natural, cultural, social and economic environments. It should be recognised that Australian, Queensland and local Governments, special interest groups and the general public will have an interest in the EIS.

All phases of the Project should be described in the EIS including pre-construction, construction and operation, and rehabilitation of disturbed lands. Direct, indirect and cumulative impacts should be identified and assessed with respect to the environmental values of the Project area and its potential area of impact. Cumulative impacts include impacts accumulating over time and impacts exacerbated by intensity or scale or frequency or duration of impacts both at the site and remote to the site.

Specifically, the EIS should provide:

- An executive summary of the potential environmental impacts of the Project.
- An overview of the Proponent and its operations.
- A description of the Project's objectives and rationale, as well as its relationship to strategic policies and plans.
- A description of the entire Project, including associated infrastructure requirements.
- A description of feasible alternatives capable of substantially meeting the Project's objectives.
- An outline of the various approvals required for the Project to proceed.

- Descriptions of the existing environment, particularly where this is relevant to the assessment of impacts.
- Measures for avoiding, minimising, managing and monitoring residual impacts, including a statement of commitment to implement the measures.
- Rigorous assessment of the residual risks of environmental impacts arising from the Project and relevant alternatives on environmental, social and economic values, relative to the 'no project' scenario. The extent of baseline and predictive studies should be commensurate to risks. Assessments should address direct and indirect, combined, short- and long-term, beneficial and adverse impacts, as well as cumulative impacts in combination with other known activities. An estimation of the reliability of predictions should also be provided.
- A description of stakeholder consultation undertaken.
- Responses to issues raised during public and stakeholder consultation.

Consideration should be given to undertaking baseline and predictive studies to address all controlling provisions triggered by the proposal.

The main report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. The EIS will therefore consist of the main report together with appendices.

In preparing the EIS, the approach to be adopted requires that:

- Predictions of environmental impacts are based on scientifically supported studies.
- The EIS is to present all technical data, sources of authority and other information used to assess impacts.
- The methods used to undertake the specialist studies are outlined, together with the relevant assumptions and professional or scientific judgments.
- The scientific reliability of investigations and predictions is indicated, including the estimated degree of certainty or if possible, statistical confidence wherever appropriate.
- Proposed measures to mitigate and manage identified issues are described.
- Residual impacts that are not quantifiable are described qualitatively, in as much detail as reasonably practicable.

The assessment of all environmental impacts needs to encompass both potential impacts on, and uncertain risks to, the environment. The level of investigation of potential impacts or particular risks needs to be proportionate to both the severity of the potential consequences of possible events and the likelihood of those events occurring.

Specific types of relevant impacts requiring investigation are set out in Part B. However, the EIS will need to address other issues or aspects that may emerge during the investigations and preparation of the EIS. Ultimately, it is the Proponent's responsibility to ensure that adequate studies are undertaken and reported.

The EIS should state the criteria adopted in assessing the proposed Project and its impacts, such as compliance with relevant legislation, policies, standards, community acceptance and maximization of environmental benefits and minimization of risks.

The level of analysis and detail in the EIS should reflect the level of significance of the expected impacts on the environment. Any prudent and feasible alternatives should be discussed and treated in sufficient detail, and reasons for selection of the preferred option should be clearly identified.

Where possible, information provided in the EIS should be clear, logical, objective and concise, so that non-technical persons may easily understand it. Where appropriate, text should be supported by maps and diagrams. Factual information contained in the document should be referenced wherever possible. Where applicable, aerial photography and/or digital information (e.g. of Project site, infrastructure corridors, etc) should be presented.

The term “detail” and “discuss” should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate. Should NAC require any information in the EIS to remain confidential, this should be clearly indicated, and separate information should be prepared on these matters.

The term “Project” includes all activities undertaken on lands covered by the granted and proposed mining leases, materials transport corridors and supporting project infrastructure (e.g. any new or expanded coal loading facilities, electricity transmission easements etc.). Where existing facilities are to be used to support the Project (e.g. existing coal loading, rail and port facilities), the potential for a significant increase in environmental impact arising from Project activities is to be discussed. Where there is a likelihood of a significant increase in environmental impact, the impact should be described along with proposed management of unavoidable impacts.

4. STAKEHOLDER CONSULTATION

The Proponent should undertake a comprehensive program of consultation with government agencies, key stakeholders and interested parties. The consultation program should provide stakeholders with the opportunity to obtain information about the Project being examined by this EIS, to raise issues and express their concerns and to receive feedback on how the Proponent intends to address the issues and mitigate all adverse impacts of the Project. Consultation with the Advisory Agencies should be the principal forum for identifying legislation, policies, regulations and guidelines relevant to the Project and EIS process.

Appropriate communication processes, possibly including information bulletins and discussion papers, should be used to disseminate information about the Project to a wider audience and to inform stakeholders of the Proponent’s progress in the EIS process, in particular on specific issues.

The Proponent is encouraged to provide opportunities for the general public to obtain information about, and comment on, the Project through such forums as public information sessions.

As part of this EIS process, consultation will also be undertaken to better understand the social impacts of the proposed Project and opportunities for mitigation of those impacts.

5. GENERAL EIS FORMAT

The EIS should explain how the EIS responds to the ToR. The EIS documentation is to include appendices containing:

- A copy of the final ToR.
- A list of persons, interest groups and agencies consulted during the EIS.
- A list of Advisory Agencies consulted with an appropriate contact.
- The names of, and work done by, all personnel involved in the preparation of the EIS.

Maps, diagrams and other illustrative material should be included in the EIS to assist in the interpretation of the information.

The Proponent should consider including a separate chapter/section in the EIS in which the controlling provisions of the EPBC Act are addressed in one place. This could be achieved by copying relevant information from the body of the EIS and with it constructing a stand-alone section addressing matters of relevance under the EPBC Act.

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS document should not contain watermarks across the body of the text. The EIS should also be produced on CDROM/DVD.

Two separate CDROM/DVD copies should be provided:

1. CDROM/DVD copies at a resolution equivalent to the printed document for distribution to stakeholders.
2. CDROM/DVD copies for placement on the internet. Copies should be in Adobe® PDF format for placement on the internet. All compression must be down-sampled to 72 dpi. PDF documents should be no larger than 1 MB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 1 MB file size.

The final nature and number of EIS copies required to be submitted and made available, should be discussed and agreed with the CG in the early stages of the EIS process.

PART B — CONTENT OF THE EIS

EXECUTIVE SUMMARY

The function of the Executive Summary is to convey the most important aspects and options relating to the Project to the reader in a concise and readable form. The structure of the Executive Summary should follow that of the EIS, although it should be strongly focussed on the key issues and conclusions, and management / mitigation measures. It should use plain English and avoid the use of jargon and esoteric terms. The Executive Summary should be written as a stand alone document, able to be reproduced on request and distributed to interested parties who may not wish to read or purchase the EIS as a whole.

The structure of the Executive Summary should generally follow that of the EIS, but focus on key issues to enable the reader to obtain a clear understanding of the Project and its potential adverse and beneficial environmental, social and economic impacts and the management measures to be implemented by the proponent to mitigate all residual impacts.

The Executive Summary should include:

- The title of the Project.
- Name and contact details of the Proponent, and a discussion of previous projects undertaken by the Proponent, if applicable, and their commitment to effective environmental management.
- A concise statement of the aims and objectives of the Project.
- The legal framework, decision-making authorities and advisory agencies.
- An outline of the background to and need for the Project, including the consequences of not proceeding with the Project.
- An outline of the alternative options considered and reasons for the selection of the proposed development option.
- A brief description of the Project (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate.
- An outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts.

GLOSSARY OF TERMS

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

1. INTRODUCTION

The introduction should clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. It should also define the audience to whom it is directed, and contain an overview of the structure of the document.

1.1 Project Proponent

This section should provide details regarding NAC as the Project Proponent. It should describe the experience of NAC, including nature and extent of business activities, experience and qualifications, and environmental record including NAC's environmental policy.

1.2 Project Description

This section should provide a brief description of the key elements of the Project including associated infrastructure requirements. A detailed description of the Project should be presented in Section 2. The location of the Project and its infrastructure requirements should be described and mapped.

1.3 Project Objectives and Scope

This section should provide a broad statement of the objectives and rationale that have led to the development of the Project and a brief outline of the events leading up to the Project's formulation, including alternatives, envisaged time scale for implementation and Project life, anticipated establishment costs and actions already undertaken within the Project area as well as its relationship to strategic policies and plans.

This section should also describe how the Project relates to any other actions, of which NAC should reasonably be aware, that have been, or are being, taken or that have been approved in the area affected by the Project.

1.4 Project Need, Costs and Benefits

The EIS should describe the justification for the Project including:

- The status of the Project in a regional, state and national context.
- Strategic, economic, environmental and social implications of the Project.
- The Project's technical feasibility and commercial viability.

This section should also summarise:

- The economic and social costs and benefits of the Project to industry and the wider community, including employment and spin-off business development.
- Increased demands on natural resources.
- Regional socio-economic issues including cultural impacts, community disruption, related land use changes, employment, skills development and any workforce accommodation issues.

1.5 Alternatives to the Project

This section should describe feasible alternatives for the proposed 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. Reasons for selecting the preferred options should be delineated in terms of relevant technical, commercial, social and natural environment aspects. In particular, the discussion of reasonably practicable alternatives to the Project should include:

- The alternative of taking no action.
- A comparative description of the impacts of each alternative for the Project on matters of national environmental significance.
- Sufficient detail to clarify why any alternative is preferred to another.

The interdependencies of the Project components should be explained, particularly in regard to how any industrial developments and any infrastructure requirements relate to the viability of the Project. Should transport, water supply and/or power infrastructure be included as an element of the Project, 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.

1.6 The Environmental Impact Assessment Process

This section should make clear the objectives of the EIS process under the SDPWO Act, the environmental authority approval process under the EP Act and mining lease approval under the MRA. This section should include a description of the impact assessment process, timing and decisions to be made for relevant stages of the Project and an outline of the various approvals required for the Project to proceed. In particular, this section should outline mechanisms in the process for public input and the public release of an EIS.

1.6.1 Objectives of the EIS

This section should provide a statement of the objectives of the environmental impact assessment process. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The purpose of the EIS is to:

- Provide public information on the need for and likely effects of the Project.
- Set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values.
- Demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values.

Discussion of options and alternatives is a key aspect of the EIS.

1.6.2 Submissions

Interested and affected persons should be made aware of how submissions on the EIS will be addressed and taken into account in the decision-making process. The EIS should inform the reader as to:

- How to make submissions, provide contact details.
- What form the submissions should take.
- When submissions must be made to gain standing for any appeal process.

1.7 Public Consultation Process

The public consultation process should identify broad issues of concern to local community and interest groups and should continue from Project planning through commissioning, operations, decommissioning and final rehabilitation/mine closure. This section should outline the methodology that will be adopted to identify and mitigate environmental (including socio-

economic) impacts that may arise from the Project. Any documented response to, or result of, the consultation process should also be provided.

The public consultation program should be incorporated into the EIS and should provide ongoing opportunities for community involvement and education. Such examples of community involvement include the proposed relocation of state-controlled roads and stock routes, water allocation applications and any development applications requiring public consultation under the *Integrated Planning Act 1997* (IPA).

1.8 Project Approvals

1.8.1 Relevant Legislation and Policy Requirements

The aim of this section is to provide the reader with an explanation of the legislation and policies controlling the approvals process for the Project. Reference should be made to the SDPWO Act, EP Act, MRA, IPA, *Transport Infrastructure Act 1994*, *Land Act 1994*, *Water Act 2000*, *Vegetation Management Act 1999* and other relevant Queensland laws. All requirements of the EPBC Act, *Native Title Act 1993*, *Australian Heritage Commission Act 1975* and other relevant Commonwealth laws should also be included.

The EIS should describe the approval process resulting from the gazettal of this Project as a significant project pursuant to the SDPWO Act and outline the linkage to other relevant State and Australian legislation. This outline should describe the public notification processes and appeal rights that will be available in the anticipated approval processes. The EIS should indicate the level of approvals anticipated by NAC for each Project element in order that approval agencies are able to determine the completeness of the information presented and the scope to generate the anticipated approvals.

In addition, local government planning controls, local laws and policies applying to the development should be described, and a list of the approvals required for the Project should be provided.

1.8.2 Planning Processes and Standards

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

1.9 Accredited Process for Controlled Actions under Australian Legislation

The Project is a controlled action under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and a significant project under the SDPWO Act. The EIS will be developed pursuant to the Bilateral agreement between the Australian and Queensland Governments for the purposes of the Australian Government's assessment under the EPBC Act.

The EIS should address potential impacts on the matters of national environmental significance (NES) that were identified in the 'controlling provisions' when the Project was determined to be a controlled action. As a minimum requirement, the EIS should provide separate discussions under sub-headings in the relevant sections that describe the values and address the potential impacts on NES matters (see Section 3.4) that exclusively address those issues relevant to the controlling provisions. The impacts should also be assessed in the context of how well the ecological values are represented and protected in the region.

Alternatively, a stand-alone report could be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. As an appendix, the report should follow the following template outline:

- 1 Introduction
- 2 Description of proposed action (as it would impact on NES matters)
- 3 Description of the affected environment relevant to the controlling provisions (i.e. describe the features of the environment that are NES matters protected under the EPBC Act)
- 4 Assessment of impacts on NES matters and mitigation measures
- 5 Conclusions
- 6 References.

2 DESCRIPTION OF THE PROJECT

The objective of this section is to describe the Project through its lifetime of construction and operation and decommissioning. The Project description also allows further assessment of which approvals may be required and how they may be managed through the life of the Project.

2.1 Overview of Project

The EIS should provide an overview of the Project to put it into context. This section should include a description of the key components of the Project through the use of text and design plans where applicable; the expected cost and overall duration and timing of the Project; and the employment benefits from the construction and operational phases of the Project. A summary of any environmental design features of the Project should be presented.

2.1.1 Mine

This section should provide details on aspects of the mine components of the Project, including:

- The location of the proposed mine, illustrated on maps.
- Probable pit boundaries and mine path.
- Mine development sequence or timeframes.
- Proposed stream diversions and water storages.
- Any road diversions.
- Any final void to be left at the cessation of mining.

The rationale for the preferred operational program should be explained. The identification of all site access points to, from and within the Project should also be identified on maps, to assist in the assessment of emergency planning.

2.1.2 Associated Mine Infrastructure

This section should provide details on the following aspects of the mine's associated infrastructure (e.g. coal handling facilities and tailings storage facilities), including any infrastructure associated with delivery of coal and secondary coal distribution infrastructure:

- A description of plant and equipment to be employed.
- The capacity of plant and equipment.
- Water requirements.
- Chemicals to be used.

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

2.1.3 Ecologically Sustainable Development

The EIS should provide a comparative analysis of how the Project conforms to the objectives for “ecological sustainable development” (see the “National Strategy for Ecologically Sustainable Development (1992)”, available from the Australian Government Publishing Service).

This analysis should consider the cumulative impacts (both beneficial and adverse) of the Project from a life-of-project perspective, taking into consideration the scale, intensity, duration or frequency of the impacts to demonstrate a balance between environmental integrity, social development and economic development.

This information is required to demonstrate that sustainable development aspects have been considered and incorporated during the scoping and planning of the Project.

2.2 Location

The regional and local context of the Project should be described and illustrated on maps at suitable scales and reference points. Real property descriptions of the Project site should be provided. Maps should show the precise location of the Project area, and in particular:

- The location of the resource to be explored, developed or mined.
- 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 mining tenures, granted 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 mine excavation(s), stockpiles, areas of fill, watercourses, plant locations, water storages, buildings, bridges, culverts, hardstands, car parks and any final void to be left at the cessation of mining etc.
- 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.
- The location of all proposed Project transport and coal loading infrastructure for both new works and upgrades of existing infrastructure, including the various coal transport options considered with an explanation for the rationale for the preferred transport option(s) for the Project.
- The location of any proposed buffers surrounding the working areas.
- The identification of all site access points to, from and within the Project on maps, to assist in the assessment of emergency planning.

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.

2.3 Construction

The extent and nature of the Project’s construction phase should be described (as well as any works required off-site enabling construction to commence, e.g. road upgrades), including a map at reasonable scale that shows the footprint of the mine and construction works. The description

should include the type and methods of construction, the construction equipment to be used and the items to be transported onto the construction site including the quarry sites from which any gravel/rock is extracted.

Any staging of the Project should be described and illustrated showing site boundaries, development sequencing and timeframes.

This section should include a summary of the results of studies and surveys undertaken to identify the natural resources required to implement the Project. The location, volume, tonnage and quality of natural resources required must be described (e.g. land, water, forests, energy, etc.).

2.3.1 Mine

This section should provide a description of construction activities relating to the Project including:

- Site access:
 - upgrading of roads, railways and other infrastructure;
 - clearing; and
 - establishment requirements for construction facilities.
- Construction requirements, including source and extraction of construction materials:
 - details of the method of construction of the mine and volumes of material required; and
 - any staging of construction activities.
- Type, source, quantity and method of transport of construction materials.
- General construction standards and site management, including environmental and safety management.
- An assessment of expected physical and chemical properties and quantities of soil/rock to be excavated.
- Details of any potential disruption to flows of waterways during construction and any diversion works required.
- Relocation of existing infrastructure.
- Timetable for construction, particularly noting seasonal rainfall or flows.
- The hours of operation.
- Emergency aid/medical facilities to be provided on site.
- The construction methods and containment/disposal of construction spoil.
- Solid and liquid waste handling.

2.3.2 Associated Infrastructure

This section should provide a description of construction activities relating to the Project's associated infrastructure, including for transport of coal and water:

- A map showing location of any works.
- On-site plans, layouts, boundaries and elevations.
- Detailed concept and staging (if any proposed) for additional transport facilities and locations.
- Plant and machinery likely to be involved.

- Supply and storage of materials – volume, composition, handling and storage during construction.
- Extent that service corridors will be used during construction and maintenance.
- Width of vegetation clearing required. This information must indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas and creek crossings), and must also reference where in the EIS the impacts on such vegetation have been addressed.
- the location(s) of any road/rail crossings along proposed conveyor/water pipeline routes for the Project.
- Typical crossing techniques including restoration works that would be used at creek crossings, and road, rail, and other service corridor crossings.
- Disposal of plant-matter left after clearing vegetation.
- Details of any hydrostatic testing procedures (discussion of water usage for this activity must be addressed in section 3.3).
- Cleanup and restoration (rehabilitation) of areas used during construction including any camp sites and storage areas.
- Disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity.

2.4 Operations

2.4.1 Mine

The EIS should include a description of the following:

- Mine life and coal resource base:
 - the proposed mine life and an outline of the coal resource base; and
 - the quantity of coal to be mined annually including any proposed ramping-up of production or staging of development.
- Mining methods and equipment:
 - the mining type and methods to be used, including the major equipment to be used in the various components of the operation; and
 - the use of different techniques in areas of different topographic or geo-technical character.
- Mine sequencing:
 - the proposed sequence and timing of mining of each seam within the mining lease;
 - the physical extent of excavations,, including proximity of mining to the state-controlled road (Dalby Cooyar Road) to ensure management of any potential for subsidence of road infrastructure from mining,
 - the location of stockpiles of overburden or coal reject/tailings to be handled during the Project's operation or left after mining ceases, including the rate of throughput of stockpiles of product, reject and overburden;
 - the proposed progressive backfilling of excavations; and
 - the area disturbed at each major stage of the Project.

- Processing and products:
 - concept and layout plans 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;
 - the quantities and characteristics of the products produced on an annual basis; and
 - indicative process flow-sheets showing material balances for the processing plant, and the anticipated rates of inputs, along with similar data on products (e.g. product or washed coal), wastes (e.g. tailings and coarse rejects) and recycle streams (e.g. water).
- Ongoing evaluation and exploration activities:
 - the extent and nature of any proposed ongoing exploration or geological and geotechnical evaluation within the Project area that may be required over the life of the Project.
- Coal handling:
 - the proposed methods and facilities to be used for coal storage and for transferring coal from the mining lease to the proposed delivery options, including on plans at an appropriate scale;
 - any environmental design features of coal stockpiling and blending and any off-site facilities;
 - the capacity of the delivery options to handle the proposed coal volumes generated by the Project over all phases of development; and
 - the cumulative longer-term demands on coal handling capacity at the Port of Brisbane from all regional coal export proposals, even though the capacity to manage these impacts may fall beyond the scope of this Project EIS.

2.4.2 Associated Infrastructure

This section should discuss the operation of associated infrastructure, including inspection and surveillance activities and frequency, the impact on the ecology as a result of operation and maintenance activities and safety procedures.

The operation of any new coal distribution infrastructure should be described, as well as the expected use of any such existing infrastructure. The capacity of any existing infrastructure to accept additional loadings resulting from any new or increased coal production should also be described.

Details on the operational requirements of any water supply infrastructure, including pump stations and balance tanks, should be described.

The operation of associated infrastructure should include a discussion of:

- Management arrangements, including the administration and control of the facility.
- Chemicals and hazardous goods to be utilised.
- Security, public safety and emergency procedures.
- Power back-up in an emergency.

- Appropriate sound-proofing.

2.5 Infrastructure Requirements

The EIS should describe (with concept and layout plans) all requirements for constructing, upgrading or relocating infrastructure in the vicinity of the Project area. The matters to be considered include such infrastructure as roads, railways, bridges, tracks and pathways, bore fields, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

2.5.1 Transport

This section should provide a brief overview of transport requirements for the Project during the construction, operation and decommissioning phases, including for the transport of plant, equipment, products, wastes and personnel. The description should address the use of existing transport infrastructure (road, rail and port) and all requirements for the construction, upgrading or relocation of any transport related infrastructure, including new roads, road alignments, or proposed road closures.

Details of proposed use of rail for transport of materials, products or wastes to or from the Project site should be discussed. In relation to shipping of products, details of the number of ships and their size should be documented.

Full details of transport volumes, modes and routes should be provided in accordance with Section 3.8 Transport.

2.5.2 Water Supply and Storage

The water resource requirements of the Project should be critically determined including the quality and quantity of all water supplied to the site. In particular, the proposed and optional sources of water supply should be described (e.g. bores, water barrier works, dams, municipal water supply pipelines and dewatering mining pits).

Estimated rates of supply from each source (average and maximum rates) should be given. Any proposed water conservation and management measures should be described. Factors such as potential on-site efficiencies, water conservation and re-use strategies should be evaluated.

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

Consideration should be given to any water allocation schemes or management plans in relation to any proposals to utilise sources of surface water and groundwater.

2.5.3 Sewerage

This section should describe, in general terms, the sewerage infrastructure required by the Project. If it is intended that industrial effluent or relatively large amounts of domestic effluent are

to be discharged into an existing sewerage system, the capacity of the existing system to accept the effluent should be assessed.

2.5.4 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 Project. The location of any easements should be shown on an infrastructure plan. Energy conservation should be briefly described in the context of any Australian, state and local government policies.

2.5.5 Telecommunications

The EIS should provide details of the telecommunication requirements for the Project, including sources and methods. This section should also describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

2.5.6 Workforce and Accommodation

This section should describe the number of personnel to be employed, the skills' base of the required workforce and the likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each component of the Project. The estimated number of people to be employed during construction and operations and arrangements for their transport to and from the Project areas, including the proposed use of regional or charter air services should be provided.

Estimates should be provided according to occupational groupings and variations in the workforce numbers for the duration of the Project. The information should show anticipated peaks in worker numbers during the construction period.

The EIS should provide an outline of recruitment schedules and policies for recruitment of workers, addressing recruitment of local and non-local workers.

This section should also discuss an accommodation strategy for the construction workforce that addresses the estimated housing needs of both single and accompanied construction workers. This should include details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site. Maps should be included as necessary to illustrate the site and should include the location of any proposed construction workers' accommodation on-site or in the vicinity of the Project. The strategy should also include details of the operational workforce and how such accommodation is proposed to be supplied.

If camp sites are to be used to accommodate the workforce, details on the number, location (shown on a map), proximity to the construction site and typical facilities for these sites should be provided. Information should include data relating to facilities for:

- Food preparation and storage.
- Ablution facilities.
- Vector and vermin control.
- Fire safety.

- Dust and noise control in relation to proximity of camp site to the construction area.
- The service personnel required to maintain the camp and the supply of services to each construction camp.

Local government approvals required for establishment and operation of such camps should be outlined.

2.5.7 Other Infrastructure

The EIS should provide a description of any other developments directly related to the Project not described in other sections, such as fuel storage areas, equipment hardstand and maintenance areas and technical workshops and laboratories.

2.6 Rehabilitation and Decommissioning

This section should describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by all components of the Project. The strategic approach to progressive and final rehabilitation of the mine site should be described. This description should also outline rehabilitation success criteria for the Project post mine closure.

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 temporary dam sites should be shown on maps at a suitable scale.

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”, specifically:

- Mining and rehabilitation should aim to create a landform with land use suitability similar to that prior to disturbance unless other beneficial land uses are pre-determined and agreed.
- Proposals for capping mine wastes and disturbed land should be based on site investigations, materials testing and stability analysis of concept designs.
- Mine wastes and disturbed land should be rehabilitated to a condition which 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 Project area 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 EIS should present the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by mining activities to achieve a stable, revegetated landform. A timetable of these works should be presented. The final predicted topography of excavations and overburden dumps should be shown. The post-mining land use suitability of the various land disturbance types should be described, as recommended in the “Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland, 1995”.

Any proposals to divert waterways during construction, and, if applicable, proposals for the reinstatement of the waterways after construction has ceased, should be provided. Where dams are to be constructed, proposals for the management of these structures after the completion of

the Project should be given, subject to agreement of the landowner and the approval of the entity administering the *Mineral Resources Act 1989*. Also, the final drainage and seepage control systems and long-term monitoring plans should be described.

A description of topsoil management should consider suitability, erosion and dispersion potential, transport, storage and replacement of topsoil to disturbed areas. Details should be provided of a weed management program for rehabilitated and disturbed areas covering a minimum period of two years following completion of construction.

Decommissioning of the Project, 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 on how buildings and structures would be removed or made safe, if left in situ. Information should also be provided on how each dam could be decommissioned to ensure that the resulting land forms do not retain the flow of water. 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.

Detail of the impacts of the preferred rehabilitation strategy should be discussed in the appropriate subsections of Section 3 (Environmental values and management of impacts) particularly with regard to such issues as final landform stability (section 3.2.4), rehabilitation of flora (section 3.4.2) and the long-term quality of water in any final voids (section 3.3.2). 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.

3 ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

The functions of this section of the EIS are to:

- Describe the existing environmental values of the area which may be affected by the Project. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS.
- Describe the potential adverse and beneficial impacts of the Project on the identified environmental values. Any likely environmental harm on the environmental values should be described.
- Describe any cumulative impacts on environmental values caused by the Project, either in isolation or by combination with other known existing or planned sources of contamination.
- Present environmental protection objectives and the standards and measurable indicators to be achieved.
- Examine viable alternative strategies for managing impacts. These alternatives should be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed.

This section should detail the environmental protection measures incorporated in the planning, construction, operations, decommissioning, rehabilitation and associated works for the Project. Measures should prevent, or where prevention is not possible, minimise environmental harm and maximise socio-economic and environmental benefits of the Project. Preferred measures should be identified and described in more detail than other alternatives.

This section should address all elements of the environment, such as land, water, coast, air, noise, nature conservation, cultural heritage, social and community, economy, waste, health and safety, hazards and risk, in a way that is comprehensive and clear.

It is recommended that 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 Management Plan (EMP) for the Project (see Section 4).

3.1 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 (e.g. temperature inversions) that may affect management of the Project, including air quality within the region of the Project.

Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the Project site. The vulnerability of the area to natural or induced hazards, such as floods and bushfires, should also be addressed. The relative frequency and magnitude of these events should be considered together with the risk they pose to management of the Project.

The EIS should provide an assessment of the Project's vulnerabilities to climate change and describe possible adaptation strategies for the activity including:

- A risk assessment of how changing patterns of rainfall and hydrology, temperature and extreme weather may affect the viability and environmental management of the Project.
- The preferred and alternative adaptation strategies to be implemented.
- Commitments to undertaking, where practicable, a cooperative approach with government, other industry and other sectors to address adaptation to climate change.

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 3.2. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management and tailings dams) should be addressed in Section 3.9 with regard to contamination of waterways and in Section 3.3 with regard to the design of the waste containment systems. The impacts of winds, rain, humidity and temperature inversions on air quality should be addressed in Section 3.5.

3.2 Land

This section describes the existing environment values of the land area that may be affected by the Project. 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.

3.2.1 Topography and Geomorphology

3.2.1.1 Description of Environmental Values

Maps should be provided locating the Project in both regional and local contexts. The topography of the Project site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum. Commentary on the maps should be provided highlighting the significant topographical features.

The environmental values of the cultural landscapes of the affected area, in terms of the physical and cultural integrity of the area, should be described.

3.2.1.2 Potential Impacts and Mitigation Measures

The potential impacts of the landscape character of the Project site and the surrounding area should be described. 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.

3.2.2 Geology

3.2.2.1 Description of Environmental Values

The EIS should provide a description, map and a series of cross-sections of the geology of the mine site, with particular reference to the physical and chemical properties of surface and sub-

surface materials and geological structures within the proposed areas of disturbance. The general suitability of the mine site overburden material for road building should be discussed briefly.

Geological properties of all Project sites which may influence stability, occupational health and safety, rehabilitation programs, or the quality of waste water leaving any area disturbed by the Project should be described.

Investigations into the physical, geo-mechanical and chemical properties of waste rock in both fresh and weathered forms needs to be determined for slope stability, rehabilitation and possible acid generation for waste rock dump design.

This section should also consider the geology underlying the proposed infrastructure corridors for coal transport, electricity easements, pipeline easements and other off-mine infrastructure. Of particular interest are any other possible coal, petroleum, gas or other mineral resources that may be impacted or sterilised by the infrastructure.

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

The location, tonnage and quality of the coal resources within the Project area should be described in detail and, where possible, should be presented on a 'seam by seam' basis and include the modifying factors and assumptions made in arriving at the estimates. The 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.

3.2.2.2 Potential Impacts and Mitigation Measures

The EIS should analyse the effectiveness of the mining proposal in achieving the optimum utilisation of the coal resources within the Project area and consider its impacts on other resources. It should demonstrate that the mining proposal will 'best develop' the coal resources, 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.

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.

3.2.3 Soils

3.2.3.1 Description of Environmental Values

A soil survey of the sites affected by the Project should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the

land. Information should also be provided on soil stability, suitability for construction of proposed facilities and any approved Soil Conservation Plans.

Soil profiles should be mapped at a suitable scale and described according to the “Australian soil and land survey field handbook (McDonald et al, 1990)” and “Australian soil classification (Isbell, 1996)”. An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the “Planning guidelines: the identification of Good Quality Agricultural Land (DPI & DHLGP, 1993)”, and the “State Planning Policy 1/92: Development and the Conservation of Agricultural Land (DME, 1995)”.

The requirement for soils mapping in terms of area and mapping scale should follow the “Queensland Department of Mines and Energy: 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.

3.2.3.2 Potential Impacts and Mitigation Measures

Possible erosion rates and management techniques should be described for all permanent and temporary landforms. The erosion potential (wind and water) and erosion management techniques should be outlined for each soil type identified. 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 EIS should include an assessment of likely erosion effects for all disturbed areas such as:

- Areas cleared of vegetation.
- Waste dumps.
- Stockpiles.
- Dams, banks and creek crossings.
- The plant site, including buildings.
- Access roads or other transport corridors.

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

Consideration should be given to the amendment or revocation of any approved Soil Conservation Plans as a result of Project activities.

3.2.4 Land Use

3.2.4.1 Description of Environmental Values

The EIS should provide a description of current land tenures, current land uses and identify the areas covered by Native Title claims in all Project areas, with particular mention of land with special purposes.

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. The environmental values affected by this infrastructure should be described.

A map at a suitable scale showing existing land uses and tenures, and the proposed mine and coal handling locations, should be provided for the entire Project area and surrounding land that could be affected by the development. This map should identify areas of conservation value in this zone. The location of existing dwellings and the zoning of all affected lands according to any existing town or strategic plan should be included.

The land use suitability of the affected area in terms of the physical and economic attributes should be described. 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 is that in "Attachment 2 of Land Suitability Assessment Techniques in the Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995)".

A land suitability map of the proposed and adjacent area should be provided, setting out land suitability and current land uses, e.g. for grazing of native and improved pastures and horticulture. Land classified as Good Quality Agricultural Land in the Department of Natural Resources' land classification system should be shown in accordance with the planning guideline, "The Identification of Good Quality Agricultural Land, which supports State Planning Policy 1/92".

3.2.4.2 Potential Impacts and Mitigation Measures

The potential for the construction and operation of the Project to change existing and potential land uses of the Project 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 Project and minimising potential liabilities for long-term management.

The potential environmental harm caused by the Project on the adjacent areas currently used for agriculture, urban development, recreation, tourism or other business and the implications of the Project 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".

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.

3.2.5 Landscape Character and Visual Amenity

3.2.5.1 Description of Environmental Values

This section should describe in general terms the existing character of the landscape that will be affected by the Project. It should comment on any changes that have already been made to the natural landscape since European settlement. It should describe the general impression of the landscape that would be obtained while travelling through and around it.

This section should also 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 should be used, particularly where addressing the following issues:

- 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.
- Focal points, landmarks (built form or topography), gateways associated with the Project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area.
- 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 Project that have the capacity to absorb land use changes without detriment to the existing visual quality and landscape character.
- The value of existing vegetation as a visual screen.

3.2.5.2 Potential Impacts and Mitigation Measures

The potential impacts of the Project landscape character of the site and the surrounding area should be described. 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.

This section should also discuss the visual impact of the construction and operation of the Project as it relates to the surrounding landscape on particular panoramas and outlooks. The assessment should address the local and broader visual impacts of the Project structures. Appropriate simulations to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations should be utilised. The significance of any clearing of vegetation, from a local amenity, landscape and visual perspective should be discussed.

Information should be supplied on the techniques proposed to minimise visual impacts. Special consideration should be given to public roads or thoroughfares or places of residence, recreation, worship or work which are within the line-of-sight of the Project sites.

Details of the design and colour of any major structures, buildings or fixed plant and all proposed screenings either vegetative or material should be described and discussed where relevant to the minimisation of the visual impacts of the Project.

The obstruction of sunlight due to the construction of buildings or alteration of landforms should be considered, as well as major illumination or reflection impacts on adjacent properties or roads.

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

Details of management of lighting for all stages of the Project should be provided, with particular reference to the objectives and proposed management regime 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.
- Changed habitat conditions for nocturnal fauna and associated impacts.

3.2.6 Land Contamination

3.2.6.1 Description of Environmental Values

This section should discuss the potential for land contamination within the Project area from existing and past uses, based on land use history and the nature and quantity of any contaminants. The review should identify land within the proposed mine, associated infrastructure corridors and any other areas affected by the proposed works, which has been used, or is being used, for a Notifiable Activity as listed in Schedule 2 of the *Environmental Protection Act 1994*, or is potentially contaminated, or is on the Environmental Management Register (EMR) or Contaminated Land Register (CLR).

The EIS should include a preliminary site investigation, for all properties that will be affected by the Project.

3.2.6.2 Potential Impacts and Mitigation Measures

A strategy for managing potential contamination on those properties, which are listed on the EMR/CLR, should be developed and submitted to the EPA's Contaminated Land Unit, prior to commencement of the Project.

The EIS should discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with EPA's "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (1998)" and the "National Environment Protection (Assessment of Site Contamination) Measure 1999".

The EIS should also describe the possible contamination of land from aspects of the Project, including waste, reject coal, overburden, coal washing plant and spills at chemical and fuel storage and handling areas.

This section should describe strategies and methods to be used to prevent and manage any land contamination resulting from the Project, including the management of any acid generation or saline impacts from the mining activities and the management of chemicals and fuels to prevent spills or leaks.

3.2.7 Land Disturbance

3.2.7.1 Potential Impacts and Mitigation Measures

The EIS should contain strategies aimed at minimising the amount of land disturbed at any one time. The strategic approach to progressive rehabilitation and final decommissioning should be described. The consistency of the approach with relevant guidelines and the results of recent research should be described. Relevant documents to be considered include:

- "Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland, DME (1995)".
- "Final Report Post Mining Landscape Parameters for Erosion and Water Quality Control. C4011, Australian Coal Association Research Program (ACARP) (1998)".

Management of all dams, roads, rail, electricity and other infrastructure during construction operation and decommissioning phases should be described in detail.

The methods to be used for the Project, including backfilling, covering, re-contouring, topsoil handling and revegetation, should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

Proposals to divert creeks during construction or operations and, if applicable, for the reinstatement of the creeks, should be provided. A contour map of the mine area should be provided, along with final drainage and seepage control systems and any long term monitoring plans.

Relevant documents to be considered in relation to stream diversions are:

- “Final Report - Maintenance of Geomorphic Processes in Bowen Basin River Diversions C8030, ACARP (May 2000)”.
- “Final Report - Monitoring Geomorphic Processes in Bowen Basin River Diversions C9068 ACARP (January 2001)”.

Proposed decommissioning of Project operations should be described in detail, including consolidation, revegetation, fencing, and monitoring. Discussion of any decommissioning works should address rehabilitation of concrete footings and foundations, hard stand areas and storage tanks (including any potential for reuse of these facilities).

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The topsoil management should also outline how soil from Good Quality Agricultural Land will be best utilised. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed. Erosion and sediment control measures should be described, particularly in relation to the management of sodic and saline overburden material.

3.3 Water Resources

This section describes the existing environment for water resources that may be affected by the Project in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994*, Environmental Protection (Water) Policy 1997 [EPP (Water)], ANZECC 2000 and the South East Queensland Water Quality Management Strategy. The definition of waters in the EPP (Water) includes the bed and banks of waters, so this section should address impacts on benthic sediments as well as the water column.

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. Similarly, waterway barrier works may need approval under the *Fisheries Act 1994*, and if so should be addressed in the EIS.

3.3.1 Surface Waterways

3.3.1.1 Description of Environmental Values

A description should be given of the surface watercourses and their quality and quantity in the area affected by the Project 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 and existing and historical flow regimes in major streams and wetlands. Details should also be provided 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 Project. Flood studies should include a range of annual exceedance probabilities for affected waterways, based on observed data if available or use appropriate modelling techniques and conservative assumptions if there are no suitable observations. The flood modelling should include local flooding due to short duration events from contributing catchments on site, as well as larger scale regional flooding including waterways downstream.

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 Project.

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the Project. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the Project area. Complementary stream-flow data should also be obtained from historical records (if available) to aid in interpretation.

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.

The environmental values of the surface waterways of the affected area should be described in terms of:

- Values identified in the EPP (Water).
- Sustainability, including both quality and quantity.
- Physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form.
- Any water resource plans, land and water management plans relevant to the affected catchment.

3.3.1.2 Potential Impacts and Mitigation Measures

The water management systems for all Project elements should be described, addressing surface water quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface water should be discussed, along with the proposal for the diversion of affected creeks during mining, and the stabilisation of those works.

Analysis of potential impacts of the diversion of affected creeks on existing and proposed relocated roads should also be carried out. This analysis should identify any likely inundation and duration, as this may affect emergency vehicle access.

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 Project. Monitoring programs should also be designed to evaluate changes in the physical integrity and geomorphic processes associated with stream diversions.

If on-site storage of water sourced from waste water treatment plants is proposed, the EIS should detail how this water would be managed to ensure environmental harm is avoided. The EIS should also describe the design features of any such storages to effectively contain saline water and other harmful constituents.

Key water management strategy objectives include:

- Maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota).
- Maintenance or replication of the existing geomorphic condition of local watercourses.
- Minimisation of impacts on flooding levels and frequencies both upstream and downstream of the Project.

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

Potential impacts to the flow and the quality of surface waters from all phases of Project activities, including creek diversions, should be discussed, with particular reference to implications for current and potential downstream uses, including the requirements of any affected riparian area and in-stream biological uses in accordance with the EPP (Water) and the *Water Act 2000*. The impacts of surface water flow on any existing water infrastructure should also be considered.

The EIS should describe the proposed mine stormwater drainage system and the proposed disposal arrangements, including any off-site services and downstream impacts. Options for storage and/or disposal of surplus groundwater (if applicable) should be discussed, including the beneficial and adverse impacts of each option. Licensing requirements for each option should be identified.

Where dams, weirs, voids or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the containing walls, and the quality of water contained, and flows and quality of water discharged.

A dam failure impact assessment should be carried out for any proposed dams that, due to their size, trigger the need for such an assessment under the *Water Act 2000*. Any dams that are likely to be referable under the *Water Act 2000* should be noted and emergency response procedures incorporated into the Project's Environmental Management Plan (EMP).

The need, or otherwise, for licensing of any dams (including referable dams) or creek diversions, under the *Water Act 2000*, should be discussed. The process for water allocation and water discharge should be established in consultation with the EPA and DNRW. Consideration should also be given to any water allocation and management plans.

Consideration should be given to the potential impacts of the Project on floodplain hydrology (including changes to flooding characteristics), existing land use and infrastructure and the integrity of any watercourses. Minimising risk to life and property and the protection of water (flood harvesting) entitlements are also issues that should be addressed. Potential impacts to the natural environment from stream diversions should also be discussed.

The environmental values of the surface waters potentially affected by the Project should be identified in accordance with the EPP (Water). Surface water (and groundwater) quality objectives should be determined after consideration of the "Australian and New Zealand Guidelines for Fresh and Marine Water Quality (NWQMS 4, 2000)".

Risks to farmland from potentially contaminated surface water flow, particularly during flood events and/or failure of levee banks, should be assessed.

Options for flood mitigation and the effectiveness of mitigation measures should be discussed with particular reference to sediment, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna. Proposals for maintenance of flood levees post-mining should be discussed.

3.3.2 Groundwater

3.3.2.1 Description of Environmental Values

The EIS should review the quality, quantity and significance groundwater resources within the Project area. The review should include a survey of existing groundwater supply facilities (bores, wells, or excavations). The information to be gathered for analysis should include:

- Location and type of facilities.
- Pumping parameters.
- Draw down and recharge at normal pumping rates.
- Seasonal variations (if records exist) of groundwater levels.

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

This section should include reference to the:

- Nature of the aquifer/s:
 - geology/stratigraphy;
 - aquifer type - such as confined, unconfined;
 - depth to and thickness of the aquifer and transmissivity of the aquifer; and
 - potential for aquifer interconnectivity.
- Hydrology of the aquifer/s:
 - depth to water level and seasonal changes in levels, including response to existing extraction;
 - groundwater flow directions (defined from water level contours);
 - interaction with surface water;
 - existing and 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.

The environmental values of the underground waters of the affected area should be described in terms of:

- Values identified in the EPP (Water).
- Sustainability, including both quality and quantity.
- Physical integrity, fluvial processes and morphology of groundwater resources.

3.3.2.2 Potential Impacts and Mitigation Measures

The EIS should include an assessment of the potential environmental harm caused by the Project 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 Project to groundwater depletion or recharge.

This section should also propose management options available to monitor and mitigate these effects in particular, proposed methods and the feasibility of those methods to 'make good' any adverse affects on the groundwater resources utilised by adjacent landholders. The expected response of the groundwater resource to the progression and finally cessation of the Project should be described, particularly in relation to the recharge potential of aquifers affected by mining.

The EIS should include mapping and a description of potential impacts for those areas where groundwater drawdown could deplete water in the root zone of vegetation with conservation

value, particularly in localities with endangered regional ecosystems or threatened species. The sensitivity of the modelling should be of sufficient precision to fully assess the extent of groundwater depletion in the root zone of vegetation with conservation value.

The EIS should provide an assessment of the options for the beneficial use of surplus water from dewatering of the mine pit over the life of the Project, including the potential for irrigation or recharge to mitigate the impacts on areas containing vegetation with conservation value. The evaluation of options for managing the surplus water should include assessment of their potential impacts and benefits, and a rationale for the recommendation of a preferred option. If disposal of surplus groundwater into local creeks is an option, the EIS should include an assessment of the potential for such water to impact on fluvial processes and stream integrity. Strategies to mitigate any negative impacts should also be described.

An assessment should be undertaken of the impact of the Project on the local ground water regime caused by any land disturbance. An assessment of the potential to contaminate groundwater resources and associated potential impacts to humans and livestock and measures to prevent, mitigate and remediate such contamination should be discussed.

3.4 Nature Conservation

This section of the EIS should describe the environmental values of nature conservation of the Project and how these have changed over time. The environmental values of nature conservation for the affected area should be described 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.
- Aquatic and terrestrial ecosystems.

A discussion should be presented on the nature conservation values of the areas likely to be affected by the Project. The flora and fauna communities which are rare or threatened, environmentally sensitive localities including waterways, riparian zone, 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 produced by the EPA (e.g. see the draft "Regional Nature Conservation Strategy for South East Queensland 2001-2006").

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*.

3.4.1 Sensitive Environmental Areas

3.4.1.1 Description of Environmental Values

The EIS should identify whether areas that are environmentally sensitive could be affected, directly or indirectly by the Project. Environmentally sensitive areas should also include areas classified as having state, regional or local biodiversity significance or flagged as important for their integrated biodiversity values in accordance with the "Biodiversity Assessment and Mapping Methodology (EPA 2002)".

In particular, the EIS should indicate if the land affected by the Project is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should also be given to other national parks, conservation parks, wilderness areas, heritage/historic areas or items, national estates, areas of cultural significance and scientific reserves within the vicinity of the Project.

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 EPBC Act as presumed extinct, endangered, vulnerable or rare.
- Regional ecosystems listed as 'endangered' or 'of concern' under state legislation, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the EPBC Act.
- Regrowth regional ecosystems with the potential of reaching remnant status listed as presumed extinct, endangered or vulnerable.
- 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 species or essential, viable habitat for near threatened or bio-regionally significant species.
- Sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA).
- Sites containing common species which represent a distributional limit and are of scientific value or which contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance.
- Sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
 - natural vegetation in good condition or other habitat in good condition (e.g. wetlands); and/or
 - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area;
- A site containing other special ecological values, for example, high habitat diversity and areas of high endemism.
- Ecosystems which provide important ecological functions such as 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.
- 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*.

In addition, the EPBC Act should be addressed with regard to national environmentally significant matters identified by the Australian Government when the Project was determined to be a 'controlled action'. The EIS should include a discussion of the following listed threatened species

and communities under the EPBC Act, and any other listed threatened species found during survey work that could be affected within the Project area:

- *Homopholis belsonii* (Belson's Grass).
- *Bothriochloa biloba* (Lobed Blue Grass).
- *Digitaria porrecta*.
- *Pteropus poliocephalus* (Grey-headed Flying-fox).
- RE11.3.1 *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains.
- RE11.3.17 *Eucalyptus populnea* woodland with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains.
- RE11.3.21 *Dichanthium sericeum* and/or *Astrebla spp.* grassland on alluvial plains.
- RE11.8.3 Semi-evergreen vine thicket on Cainozoic igneous rocks.
- RE11.9.10 *Acacia harpophylla*, *Eucalyptus populnea* open forest on Cainozoic fine-grained sedimentary rocks.

The EIS should identify issues relevant to sensitive 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 or emissions should be assessed. The proximity of any Project infrastructure to any biologically sensitive areas should be described.

Reference should be made to both Queensland and Commonwealth endangered species legislation and the proximity of the area to any World Heritage property. The *Vegetation Management Act 1999* and the findings of any Regional Vegetation Management Plan should also be referenced.

3.4.1.2 Potential Impacts and Mitigation Measures

This section should discuss the following:

- Potential direct and indirect impacts of the Project on species, communities and habitats of local, regional or national significance as identified above, including sensitive areas and EPBC Act listed threatened species and communities.
- Proposals to mitigate such impacts (e.g. timing of works, minimise area of disturbance, proposed rehabilitation of disturbed sensitive areas and off-sets).
- Planned rehabilitation of sensitive communities and any relevant previous experience or experiments rehabilitating these communities.
- Proposals to support environmental values within the Project area.

3.4.2 Terrestrial Flora

3.4.2.1 Description of Environmental Values

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

In particular, the EIS should contain results from surveys for threatened species and communities conducted during and following the flower set and seeding period. Vegetation mapping should provide vegetation mapping for all relevant Project sites, including new transport and water infrastructure, if relevant. Adjacent areas may also require mapping.

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

- Location, extent, biodiversity status and conservation status of vegetation types using the EPA's regional ecosystem type descriptions in accordance with "Queensland Herbarium (2003), Regional Ecosystem Description Database, Version 4.2, March 2005" and "The Conservation Status of Queensland's Bioregional Ecosystems, Sattler P.S. & Williams R.D. (Eds) 1999".
- 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.

Within each defined (standard system) vegetation community, a minimum of three sites 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.
- Appropriate minimum site sizes should be selected, observing recognised sampling approaches and to provide an adequate sample of surveyed communities.
- 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.
- Vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database.
- 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 EIS. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value.

The occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Pest and Stock Route Management) Act 2002* should be shown on a map at an appropriate scale. Any survey to identify the presence of such plants will need to occur after significant summer rainfall events to allow germination.

The location of any horticultural crops in the vicinity of the Project facilities should be shown.

3.4.2.2 Potential Impacts and Mitigation Measures

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

Where removal of native vegetation is proposed, alternative management strategies such as compensatory plantings and conservation projects within and outside the Project area and rehabilitation trials using significant flora species or protection of nearby significant vegetation should be described. Any specific ‘off set’ vegetation protection proposals to compensate for the removal of endangered vegetation (State and Commonwealth) should be outlined. Consideration should be given to proposals to link revegetated areas with undisturbed regional ecosystems.

The EIS should discuss weed management strategies to contain existing weed species (e.g. declared plants) and ensure no new declared plants are introduced to the area.

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

3.4.3 *Terrestrial Fauna*

3.4.3.1 Description of Environmental Values

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

- Species diversity (i.e. a species list) and abundance of animals, including 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.
- Existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of protected area management plans).
- Use of the area by migratory birds, nomadic birds, fish and terrestrial fauna.
- The existence of feral or exotic animals.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the sub-region where Project sites occur.

3.4.3.2 Potential Impacts and Mitigation Measures

The EIS should describe the potential impacts on fauna due to the disruption of their movement corridors by the removal of sections of habitat and by the fragmentation of habitat due to the mine development and associated infrastructure corridors. Mitigation measures for impacts on fauna movement should be proposed and discussed. These impacts should be assessed in the context of how well the ecological values are represented and protected elsewhere, as identified by the "Biodiversity Assessment and Mapping Methodology (EPA 2002)".

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

Feral animal management strategies and practices should also be addressed. The study should develop strategies to ensure that the Project does not contribute to increased encroachment of feral animal species. Reference should be made to the local government authorities pest management plan when determining control strategies. The strategies for management of pest fauna should be discussed and provided in a working form in a Pest Management Plan as part of the overall EMP for the Project.

3.4.4 Aquatic Flora and Fauna

3.4.4.1 Description of Environmental Values

The aquatic flora and fauna occurring in the areas potentially affected by the Project should be described, noting the patterns and distribution in the waterways. Detail should be provided on the sampling methods of flow conditions and water quality. A description of the habitat requirements and the sensitivity of aquatic flora and fauna species to changes in flow regime, water levels and water quality in the Project areas should be described.

The description of the fauna and flora present or likely to be present at any time during the year in the Project area should include:

- Fish species, mammals, reptiles, amphibians and aquatic invertebrates (including stygafauna) occurring in waterways.
- Aquatic (waterway) plants, including any declared pest plants.
- Aquatic substrate and stream type.
- A description of the habitat requirements and the sensitivity of aquatic flora species to changes in flow regime, water levels and water quality in the Project areas should be described.

3.4.4.2 Potential Impacts and Mitigation Measures

This section should discuss all foreseen direct and indirect effects on aquatic flora and fauna. Strategies for protecting rare or threatened species should be described, and any obligations imposed by Queensland or Australian Government endangered species legislation or policies should be discussed.

Impacts during construction and operation of the Project should be assessed. Short term and long term durations should be considered. Measures to mitigate the impact on habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described. Any provision for buffer zones and movement corridors, or special provisions for migratory, nomadic and aquatic animals should be discussed. Details of mitigation strategies should be provided.

With regard to aquatic flora and fauna, the assessment of potential impacts should consider:

- The effects of changes to any surface water flow regime and potential impact of groundwater drawdown.
- Effects on key rare and threatened or otherwise noteworthy plant and animal species, including listed threatened and listed migratory species and their habitat.
- The potential for, and mitigation measures to offset any proposed loss of, or disturbance to, fish habitat.
- All permits/authorities required by the Project associated with activities in waterways (e.g. permits under the *Fisheries Act 1994* to construct temporary or permanent waterway barriers).
- The potential for, and mitigation measures to prevent, the creation of new mosquito and biting midge breeding sites during construction and operation.
- The potential for, and mitigation measures to prevent, the introduction, transfer or facilitation of exotic, non-indigenous and noxious plants and water borne insect pests.

3.5 Air

3.5.1 Description of Environmental Values

This section should describe the existing air environment that may be affected by the Project.

A description of the existing air shed environment should be provided having regard for particulates and gaseous and odorous compounds. The background levels and sources of suspended particulates and any other major constituent of the air environment that may be affected by the Project 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 harm 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.

3.5.2 Potential Impacts and Mitigation Measures

The EIS should state the objectives for air emissions in respect of relevant standards (ambient and ground level concentrations), relevant emission guidelines, and any relevant legislation. The emissions should be modelled using a recognised atmospheric dispersion model. The potential for interaction between the emissions from the processing plant, and emissions in the air shed, and the likely environmental harm from any such interaction, should also be detailed.

This section should describe the quantity and quality of all air emissions, including particulates and greenhouse gases (see Section 3.5.3) from all components of the Project during construction, operation and decommissioning.

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 national guidelines (1985) for control of emissions from stationary sources”, and the Environmental Protection (Air) Policy (1998) [EPP (Air)].

Where appropriate, the predicted average ground level concentrations in nearby areas should be provided. 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. Ground level predictions should be made at any residential, industrial and agricultural site believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained. The assessment of the Project’s impact on air quality should consider the following matters:

- The features of the Project designed to suppress or minimise emissions, including dust (PM₁₀ fraction of particulates) and odours.
- Emissions of dust, fumes and odours during both normal and upset conditions and the potential impacts of such emissions on surrounding land uses and nearest sensitive receptors.
- An evaluation of the contribution of nitrogen oxides, sulphur oxides and volatile hydrocarbon emissions from the Project to impacts within the local airshed, including both acute and cumulative impacts, in conjunction with existing emission sources within the region.
- The human health risk associated with emissions from the facility of all hazardous or toxic pollutants, whether or not they are covered by the NEPM or the EPP (Air).
- Air quality predictions should be compared to the relevant goals in the NEPM and the EPP (Air) goals.
- Air shed management and the contribution of the Project to air shed capacity in view of existing and future users of the air shed for assimilation and dispersion of emissions.

3.5.3 Greenhouse Gas Emissions and Abatement

A full assessment of greenhouse gas emissions from the Project should be provided including:

- An inventory of proposed future annual emissions for each greenhouse gas and total emissions expressed in 'CO₂ equivalent' terms for each component of the Project and for the combined total Project, including an estimate of coal seam methane to be released as a result of mining activities, as well as emissions resulting from transportation and energy use by the Project.
- The intended measures to avoid and minimise greenhouse gas emissions.
- Participation in Australian Government reporting and abatement schemes.

The above assessment should be undertaken with due consideration of relevant protocols, agreements and strategies including: "The National Greenhouse Strategy"; "National Greenhouse Gas Inventory"; "The Framework Convention on Climate Change"; and voluntary programs under the Australian Greenhouse Office.

This section of the EIS should propose and assess greenhouse gas abatement measures. It should include:

- A description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the Project, including such activities as transportation of products and consumables, and energy use by the Project.
- An assessment of how the preferred measures minimise emissions and achieve energy efficiency.
- An indication of how the preferred measures for emission controls and energy consumption compare with practice in the relevant sector of industry with a view to achieving best practice environmental management.
- A description of any opportunities for further offsetting greenhouse gas emissions through indirect means (e.g. forestry plantations, carbon sequestration, investing in renewable energy projects, purchase of renewable energy or support for relevant research, etc.).

The environmental management plan in the EIS should include a specific module to address greenhouse abatement. That module should include:

- Commitments to the abatement of greenhouse gas emissions from the Project with details of the intended objectives, measures and performance standards to avoid, minimise and control emissions.
- Commitments to energy management, including undertaking periodic energy audits with a view to progressively improving energy efficiency.
- A process for regular review of new technologies to identify opportunities to reduce emissions and use energy efficiently, consistent with best practice environmental management.
- Any voluntary initiatives such as projects undertaken as a component of the national Greenhouse Challenge Plus program, or research into reducing the lifecycle and embodied energy carbon intensity of the Project's processes or products.
- Commitments to monitor, audit and report on greenhouse emissions from all relevant activities and the success of offset measures.

3.6 Noise and Vibration

3.6.1 Description of Environmental Values

This section should describe the existing environment values that may be affected by noise and vibration from Project activities.

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 Project. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997 [(EPP (Noise))]. 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 Project 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 accepted best practice methodologies, relevant EPA guidelines and Australian Standards, and any relevant requirements of the EPP (Noise).

The following guidelines and standards should be considered:

- AS1055.1 and AS1055.2, 1997. "Description and Measurement of Environment Noise, Recognised Sleep Disturbance Criteria", British Standards BS7385, part 2, 1993.
- "Evaluation and Measurement for Vibration in Buildings, Guide to Damage Levels from Ground-borne Vibration", BS6472, 1992 - Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80 Hz).
- Australian/New Zealand Standard AS/NZS 2107-2000, Acoustics – "Recommended Design Sound Levels and Reverberation Times for Building Interiors".
- "World Health Organisation Guidelines for Community Noise, 1999".

Comment should be provided on any current activities near the Project area that may cause a background level of ground vibration.

3.6.2 Potential Impacts and Mitigation Measures

The EIS should describe the modelled impacts of noise and vibration generated by all components of the Project during the construction and operational phases.

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 and measurable indicators. Particular consideration should be given to emissions of low-frequency noise; that is, noise with components below 200Hz.

The assessment should also include environmental impacts on terrestrial animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts should be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise. This description should also include temporary sensitive places, if applicable.

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, residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. A discussion should be provided of measures to prevent or minimise environmental nuisance and harm. Blasting noise and vibration limits are provided in section 61 of the *Environmental Protection Regulation 1998*. Reference should also be made to the "EPA Guideline: Noise and Vibration from Blasting".

The assessment should also address off-site noise and vibration impacts that could arise due to increased road or other transportation directly resulting from the Project.

Any potential for ground vibration effects on underground pipelines and telecommunication lines should be examined.

3.7 Cultural Heritage

3.7.1 Description of Environmental Values

The EIS should describe the existing environmental values for cultural heritage that may be affected by the Project activities.

The EIS should include a cultural heritage study that describes Indigenous and non-Indigenous cultural heritage sites and places, and their values. Any such study should be conducted by an appropriately qualified cultural heritage practitioner and should include the following:

- Consultation with:
 - the Australian Heritage Places Inventory;
 - the EPA and the Queensland Heritage Council regarding the Queensland Heritage Register and other information regarding places of potential non-Indigenous cultural heritage significance;
 - the DNRW regarding the Indigenous Site Database;
 - any local government heritage register; and
 - any existing literature relating to the affected areas.
- Liaison with representatives of relevant Indigenous communities concerning:
 - places of significance (including archaeological sites, natural sites, story sites etc), and appropriate involvement in field surveys;

- any requirements by communities and/or informants relating to selection of consultants and confidentiality of site data; and
- assessment of significance of any cultural heritage sites/places located.
- Liaison with relevant community groups/organisations (e.g. local historical societies) concerning:
 - places on non-indigenous cultural heritage significance; and
 - opinion regarding significance of any cultural heritage places located or identified.
- Identification of locations of culturally significant sites likely to be impacted by the Project, including:
 - stone artefact scatters;
 - culturally significant vegetation;
 - buildings or places of archaeological significance; and
 - archaeological sites, natural sites, story sites etc.
- The location of historical mining areas, which should be shown on maps, including the potential for former mining zones or historical workings to cause slumping or other problems.

The EIS should present a report of the work done, including background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment, conclusions and management recommendations (having due regard for any confidentiality requirements specified by community representatives).

As a minimum, investigations and consultation should be undertaken in such manner and detail to satisfy statutory responsibilities and duties of care, including those under the *Aboriginal Cultural Heritage Act 2003*, the *Queensland Heritage Act 1992* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, and to protect areas and objects of cultural heritage significance.

3.7.2 Potential Impacts and Mitigation Measures

The EIS should provide an assessment of any likely effects of the Project on sites of Indigenous and non-indigenous cultural heritage values, including but not limited to the following:

- A description of the significance of artefacts, items or places of conservation or cultural heritage value likely to be affected by the Project and their values at a local, state and national level.
- Recommended means of mitigating any negative impacts on cultural heritage values and enhancing any positive impacts.

The management of Indigenous cultural heritage impacts should be detailed in either a Native Title Agreement (NTA) with Indigenous parties or in a Cultural Heritage Management Plan (CHMP) that is developed specifically for the proposed Project. The NTA or CHMP should provide a process for the management of identified cultural heritage places and values within the Project area, including associated infrastructure corridors and be developed in a form that complies with the provisions of Part 7 of the *Aboriginal Cultural Heritage Act 2003*, to meet the cultural heritage duty of care requirements.

The EIS should describe how the potential impacts to Aboriginal cultural heritage cultural heritage values in the vicinity of the Project will be managed. Cultural heritage management for the Project should be discussed in terms of the CHMP and NTA that currently exist between the Proponent and the Native Title Claimant groups (Traditional Owners) for the Project area. The EIS should explain how the CHMP and NTA satisfy the statutory responsibilities and duties of care to protect

areas and objects of cultural heritage significance under the *Aboriginal Cultural Heritage Act 2003*, and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

The consent of the Traditional Owners should be sought to allow an outline of the intention of the NTA and accompanying CHMP. However, it is envisaged that specific details about the agreements and accompanying CHMP will remain confidential.

The NTA or CHMP should be based on information contained in the cultural heritage study report and/or information from Indigenous communities. The NTA or CHMP should include the following:

- A process for including Aboriginal 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.
- A conflict resolution process.

The EIS should describe the significance non-indigenous cultural heritage values identified within the Project area and outline the Proponent's proposed management strategy for significant non-indigenous cultural heritage values that may be impacted by the Project.

3.8 Transport

3.8.1 Transport Methods and Routes

The EIS should describe (including with the use of maps and data tables) transport methods and routes for all aspects of the transport task associated with the construction and operation of all components of the Project. Information should include:

- Existing traffic volumes on the proposed transport routes.
- Volumes, tonnage, and composition of construction inputs and production outputs.
- Hazardous or dangerous material that may be transported.
- Method of transport (e.g. sea, rail, road) and the type of vehicles most likely to be used for transport.
- Number and type of workforce traffic and service vehicles.
- Number of trips generated (both light and heavy vehicles).
- Origin and destination of inputs and outputs and transport routes proposed (with the use of maps).
- Details of over-dimension or excess mass loads.
- Timing and duration of transport activities.

This section should discuss how transport elements of the Project relate to Queensland Transport's existing transport strategies for the region and the future infrastructure needs of this area as presented in local and state government documentation.

The EIS should provide sufficient details to allow the Department of Main Roads (DMR) and Queensland Transport to ascertain compliance with legislative and design requirements to ensure the safe and efficient operation of state-controlled roads and railways are not compromised and the integrity of preserved transport corridors is protected.

This section should provide sufficient information for an assessment of how the state-controlled and local government road and the rail networks will be affected by the Project.

3.8.2 Potential Impacts and Mitigation Measures

Details of the relative impacts generated by each of the Project's components to existing transport infrastructure during construction, operation and decommissioning phases should be provided.

This section should detail the impacts of all road and rail construction and maintenance. An evaluation should also be made of the impact of the Project on existing roads, railways, powerlines, pipelines, telecommunication lines, waterways and stormwater flow-paths. This evaluation should include any potential requirements to reschedule existing infrastructure maintenance programs.

This section should identify impacts to the state-controlled road and rail networks and local government road networks and indicate clearly the corrective measures necessary to address adverse road impacts including a wet weather management strategy. An estimate of costs involved in corrective measures should also be detailed. Any upgrades to existing transport infrastructure, and associated costs, should be discussed.

Special reference should be made to any relationship between Project road works and works proposed in the current Road Implementation Program of the DMR. Road infrastructure should be described and assessed according to DMR's "Guidelines for Assessment of Road Impacts of Development Projects (April 2006)".

This section should address the impact of traffic generated by the Project on both the local government and state-controlled road network in terms of adverse road impacts including pavement degradation, intersection and road network performance, road safety and other environmental impacts.

Strategies for managing the impacts of the Project on road safety, including access for emergency response vehicles especially with regard to proposed road diversions, should be presented.

The impacts of increased traffic on existing school bus routes and services should be discussed. Necessary measures to eliminate or minimise the impact on the operation of these services and any infrastructure proposed (such as bus pull-off areas) to maintain current safety standards should be presented.

A comparison of the traffic situation and road conditions with and without the Project should be shown.

3.9 Waste

3.9.1 Waste Generation

This section should provide technical details of waste generation, treatment, minimisation and management, with proposed emission, discharge and disposal criteria. Waste should be defined and considered in accordance with the EP Act, and the Environmental Protection (Waste Management) Policy 2000 [EPP (Waste)] and include gas, liquid or solid, or a combination of any of them.

The EIS should identify and describe all sources of waste associated with construction, commissioning, operation and decommissioning of all components of the Project. This section should describe:

- The amount and characteristics of solid and liquid waste produced.
- Hazardous materials to be stored and/or used on-site, including environmental toxicity data and biodegradability.
- Any waste treatment process involved, including site drainage and erosion controls.
- Selection criteria for, and location of, likely run-off/stormwater discharge points.
- Specific details (using maps and plans as appropriate) of:
 - generation points;
 - storage methods and facilities; and
 - quantities.

The EIS should provide plans showing proposed location, site suitability, dimensions and volume of overburden dumps, coal rejects dumps and coal tailings dams, including their method of construction. Methods to prevent seepage and contamination should be given. Measures to ensure stability of the dumps and impoundments should be described.

The EIS should provide details of any waste water output including:

- Volume estimates of industrial and domestic effluent that will be produced at each Project site.
- Quality of effluent produced.
- Any mobile sewerage facilities to be used.

3.9.2 Waste Management

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

- The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management and tailings dams).
- Operational handling and fate of all wastes including storage.
- On-site treatment methods proposed for the wastes.
- Proposed discharge/disposal criteria for liquid and solid wastes.
- Methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes, including extent of use of local government facilities.
- The potential level of impact on environmental values.
- Methods proposed to recycle waste oil and waste oil containers.
- Measures to ensure stability of the mine dumps and impoundments.
- Methods to prevent seepage and contamination of groundwater from stockpiles and/or mine dumps.
- How the facilities required for the collection, storage and disposal of any waste originating from the mining lease will minimise the potential for the attraction of vermin and insects.
- Market demand for recyclable waste (where appropriate).
- Proposed waste minimisation techniques and processes.
- Decommissioning of the site.

The EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during all phases of the Project, having regard for the EPP (Waste).

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly particulates and greenhouse gases. Particular attention should be paid to measures which will maximise energy efficiency and minimise internal energy consumption of the Project.

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

3.10 Social Environment

3.10.1 Description of Environmental Values

This section should describe the existing social values that might be affected by the Project 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. The social amenity and use of the Project and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential purposes should be described.

Consideration should be given to:

- Population and demographics of the affected community, including employment and unemployment rates.
- Local community values, vitality and lifestyles.
- Community infrastructure and services, access and mobility.
- Health and educational facilities.
- Recreational, cultural, leisure and sporting facilities and activities.
- On-farm activities near the proposed activities.
- Number of properties directly affected by the Project.
- 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.

Information should also be provided on the existing housing market in the area, with an emphasis on:

- The size of the private rental market.
- The vacancy rate of rental accommodation, including assessment of seasonal fluctuations.
- Typical rents.
- The availability and typical cost of housing for purchase.
- The level of social housing.
- Constraints and opportunities for new housing construction, including the capacity of the local land development and housing construction industries to provide new housing.

3.10.2 Potential Impacts and Mitigation Measures

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 should be analysed and discussed for all stages of the development. The nature and extent of the community consultation program should be described and a summary of the results incorporated in the EIS.

The social impact assessment should include sufficient data to enable state authorities, such as Queensland Health and Education Queensland, to plan for the continuing provision of public services in the region of the Project. The summary should discuss how the impacts of population increase on public services, particularly health, education and emergency services would be mitigated.

The social impact assessment of the Project should be carried out in consultation with the Department of Communities and other relevant agencies. The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level in the short term and longer term (including mine closure).

The EIS should address the following matters:

- Impacts on demographic, social, cultural and economic profiles.
- Impacts on local residents, current land uses and existing lifestyles and enterprises.
- Impacts on human service delivery, including counselling and support services.
- Impacts on local and state labour markets, with regard to the source of the workforce.
 - This information should be presented according to occupational groupings of the workforce, along with opportunities for local employment.
 - The assessment of impacts should take account of relevant demographic, social, cultural and economic profiles.
- Any new skills and training to be introduced in relation to the Project, including the occupational skill groups required and potential skill shortages anticipated.
- Extent that service revenue and work from the Project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area.
- Impacts on existing local residents' values and aspirations.

In regard to affected Indigenous and non-Indigenous communities respectively, particular attention should be paid to the effects on:

- The ability of both Indigenous and non-Indigenous people, to live in accordance with their own values and priorities.
- The use of, and access to, culturally important areas and landscapes.
- The access to existing human and commercial services and housing.
- The ability to participate in regional and local employment and training opportunities.
- The new Project workforce and their families.

The effects of the Project 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 operational phases of the development.

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

An assessment of the predicted impacts of the Proponent's activities (including activities by any sub-contractors) on the local and regional housing markets should also be undertaken. The assessment should refer to the projected accommodation needs for the Project in both the construction and operational phases, and estimate:

- The capacity of local and regional housing markets to meet the accommodation needs of the Project, including the potential displacement of low-income residents from affordable rental accommodation and diminished availability of accommodation.
- Any possible cumulative impacts on the local and regional housing market due to the presence of other existing or proposed major projects in the area, and seasonal employment factors.
- The impact of the construction phase of the Project on the local and regional residential development and housing construction industry, with particular reference to the demand for local contractors.

Mitigation and enhancement strategies should be provided for any identified impacts to social values. Practical monitoring regimes should also be recommended.

3.11 Economy

3.11.1 Description of Environmental Values

This section should describe the existing economic environment that might be affected by the Project.

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.
- Identification of existing labour force and unemployment statistics.
- Existing housing market, particularly rental accommodation which may be available for the Project workforce.
- Types and numbers of businesses.
- Existing property and land values.
- Availability and prices of goods and services;
- Availability of suitable land for support industrial uses.
- Historical descriptions of large-scale resource developments and their effects in the region.

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

3.11.2 Potential Impacts and Mitigation Measures

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, including estimated total economic costs for materials, labour and infrastructure for the construction, operation and rehabilitation phases.

The analysis of general economic impacts of the Project should include:

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

The effect on local labour markets should be discussed with regard to the number and source of the workforce. This information should be presented according to occupational groupings of the workforce and show anticipated peaks in numbers during the construction period. 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 (i.e. single workers).

The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed and include:

- An accommodation strategy for the construction workforce, which addresses the estimated housing needs of both single and accompanied construction workers.
- Details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site.
- Maps, as necessary, to illustrate the location of any proposed construction workers' accommodation on-site or in the vicinity of the Project.
- The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the Project.
- The capacity of water supply and sewerage systems to service any new residential development and any Project proposals to supplement this infrastructure.

Any new skills and training to be introduced in relation to the Project should be identified, particularly opportunities for private investment in training. Adequate provision should be made for apprenticeship and worker training schemes, including consideration of a skills development and training strategy to assist disadvantaged groups as well as local residents.

Consideration of the impacts of the Project in relation to energy self-sufficiency, security of supply and balance of payments benefits may be discussed. Attention should be directed to the short

and long-term effects of the Project (including mine closure) on the regional income and employment and the state economy, including on the land-use of the surrounding area and existing industries, regional income and employment and the state economy.

3.12 Health and Safety

3.12.1 Description of Environmental Values

This section should describe the existing community values for public health and safety that might be affected by the Project. 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.

3.12.2 Potential Impacts and Mitigation Measures

This section should detail any impacts of the Project on the health and safety of the community, workforce, suppliers and other stakeholders, in terms of health, safety, quality of life from factors such as air emissions, dust, noise and pests. It should include details of:

- Compliance with relevant Health & Safety legislation (e.g. for the mine site – *Explosives Act 1999, Coal Mining Safety and Health Act 1999*);
- Security arrangements.
- Emergency plans and safety management strategies, as well as corroboration of the effectiveness of such systems.
- Details of on-site emergency response capabilities (e.g. on-site paramedic or first-aid officer), for both the construction and operational phases of the Project, which should include personnel trained for fire suppression and containment, rescue and first aid.

Map(s) should be provided showing the locations of sensitive receptors, such as, but not necessarily limited to, kindergartens, schools, hospitals, aged care facilities, residential areas, and centres of work (e.g. 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 Project, 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 (e.g. 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.

3.13 Hazard and Risk

3.13.1 Hazard and Risk Assessment

This section should describe the potential hazards and risk that might be associated with the Project. The EIS should include a risk assessment and hazard analysis for all components of the Project to include the following:

- An assessment of risks during the construction, operational and decommissioning phases of the Project. Where possible these risks should be assessed in quantitative terms.

- Possible hazards, accidents, and abnormal events, including extreme weather events that may arise for the Project, during construction, operation and decommissioning, including potential protest activity. This should include accidental release of hazardous materials, explosions and fires, or collapse of the mine's pit walls. It may include seismic stability of the Project area and the vulnerability of the Project to flooding, bushfire and landslip.
- Analysis of the consequences of each of these events on safety to workers and the public, and environmental damage in the Project area, particularly in the vicinity of the Project and associated infrastructure facilities.
- The likelihood of these consequences being experienced, both individually and collectively
- Presentation of risk outcomes (preferably quantitative levels) from the above analysis in a suitable format (e.g. tabular, graphical and/or as risk contours).
- Safeguards that will be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites in the Project area. Where possible, the reduced level of risk which would be experienced with these safeguards in place should be indicated.
- Comparison of assessed and mitigated risks with acceptable risk criteria for land uses adjacent to Project activities.

An analysis should be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the Project on sensitive areas and resources such as forests, water reserves, state and local government controlled roads, places of residence and work, and recreational areas, with reference to *State Planning Policy 1/03, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*.

3.13.2 Emergency Management Plan

An outline of the proposed emergency management procedures should be provided for the range of situations identified in the above risk assessment where there are measurable risks.

The following should also be presented:

- The need for any permit under the *Building Act 1975*, or any permit to store flammable and combustible liquids.
- Contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) spills during construction, operation and decommissioning of the Project.
- Contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and decommissioning phases.
- Measures to prevent combustion of in situ and stockpiled raw materials, products or process elements.
- Emergency planning and response procedures that have been determined in consultation with state and regional emergency service providers.
- Plans for involvement of the relevant state agencies (such as the Department of Emergency Services, which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland) in relation to emergency medical response and transport and first aid matters.

3.14 Cumulative Impacts

The purpose of this section is to provide clear and concise information on the overall impacts of the Project. In addition, the cumulative impacts that could occur as a consequence of the

Project in conjunction with the development of other proposals that are currently under study should be considered, including the interrelationship of these impacts as they relate to particular issues (e.g. water, air, noise, cultural heritage, social, economic etc.). These impacts should be considered over time or in combination with other impacts because of the scale, intensity, duration or frequency of the impacts.

In particular, the requirements of any relevant State Planning Policies, Environmental Protection Policies, National Environmental Protection Measures and other strategies and regulations should be addressed in assessing the cumulative impacts of the Project on the existing environment.

4 ENVIRONMENTAL MANAGEMENT PLAN

This section of the EIS should present draft environmental management plans (EMPs) developed for the Project. Separate EMPs should individually address the discrete Project elements. The EMPs should be developed from, and be consistent with, the preceding information in the EIS.

An EMP should provide control actions in accordance with agreed performance criteria for specified acceptable levels of environmental harm. In addition, EMPs should identify:

- Potential impacts on environmental values.
- Mitigation strategies.
- Relevant monitoring.
- Appropriate indicators and performance criteria.
- Reporting requirements.
- Appropriate corrective actions, should an undesirable impact or unforeseen level of impact occur.

The aims of an EMP are to provide:

- Commitments by the Proponent to practical and achievable strategies and design standards (performance specifications) for the management of the Project to ensure that environmental requirements are specified and complied with.
- An integrated plan for comprehensive monitoring and control of impacts.
- Local, state and Australian Government authorities, stakeholders and the Proponent with a common focus for approvals conditions and compliance with policies and conditions.
- The community with evidence that the environmental management of the Project is acceptable.

The recommended structure of each element of the EMP is:

Element/issue:	Aspect of construction or operation to be managed (as it affects environmental values).
Operational Policy:	The operational policy or management objective that applies to the element.
Performance Criteria:	Measurable performance criteria (outcomes) for each element of the operation.
Implementation Strategy:	The strategies, tasks or action program (to nominated operational design standards) that would be implemented to achieve the performance criteria.
Monitoring:	The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change).
Auditing:	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
Reporting:	Format, timing and responsibility for reporting and auditing of

	monitoring results.
Corrective Action:	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

An EMP should commit to manage, enhance or protect identified environmental values. The commitments should contain the following components for performance criteria and implementation strategies:

- Environmental protection objectives for enhancing or protecting each relevant value.
- Indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved.
- Environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective.
- An action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
 - continuous improvement;
 - environmental auditing;
 - monitoring;
 - reporting;
 - staff training; and
 - a decommissioning program for land proposed to be disturbed under each relevant aspect of the Project.

5 CONCLUSION AND RECOMMENDATIONS

The EIS should make conclusions and recommendations with respect to the Project, based on the studies presented, the Environmental Management Plans and the conformity of the proposal with legislative and policy requirements.

6 REFERENCES

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

7 RECOMMENDED APPENDICES

7.1 Final ToR for this EIS

A copy of the final ToR should be included in the EIS. A summary cross-referencing specific items of the Terms of Reference to the relevant section of the EIS should also be provided.

7.2 Development Approvals

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

7.3 EPBC Act Report

A stand alone report addressing potential impacts of the Project on matters of national environmental significance is recommended.

7.4 Research

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

7.5 Consultation Report

A list of advisory agencies should be provided in a summary Consultation Report, which should also list the Australian, state and local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

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

Information about identifying affected parties (as defined by the EPBC Act) and interested and/or affected persons (as defined by the EP Act) should be included.

7.6 Study Team

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

7.7 Glossary of Terms

A glossary of technical terms and acronyms should be provided.

7.8 Specialist Studies

Relevant supporting data and information generated from specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- Geology and soils.
- Land use and land capability studies.
- Waterway hydrology and groundwater.
- Flora and fauna studies including the subregional analysis of representativeness and adequacy of protection for the terrestrial / riparian vegetation communities and their component flora and fauna taxa within the affected areas.
- An integrated assessment of relative biodiversity/conservation values, based on the methodology outlined in “Biodiversity Assessment and Mapping Methodology (EPA 2002)”.
- Air pollution, noise and vibration.
- Transport and traffic studies.
- Economic studies and/or cost-benefit analyses.
- Hazard and risk studies.

7.9 Corporate Environmental Policy

NAC should attach a copy of its corporate environmental policy and planning framework document.

7.10 List of Proponent Commitments

A list of all commitments made by the Proponent in the EIS should be provided, together with a reference to the relevant section in the EIS.