The Coordinator-General

Byerwen Coal project

Terms of reference for an environmental impact statement

July 2011

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Contents

Synopsis

The proposed Byerwen Coal project (the project) involves developing both an open-cut and underground mine in the North Bowen Basin, supported by water supply via a new pipeline from the Burdekin River, a power supply upgrade, and rail facilities leading to a coal export terminal at Abbot Point.

The project proponent is Byerwen Coal Pty Ltd, a joint venture between QCoal Pty Ltd (QCoal), which is a Brisbane-based, Queensland-owned and operated coal exploration and mining company, and JFE Steel, which is a subsidiary of the JFE Group of Japan.

The proposed mine is located approximately 20 kilometres west of Glenden and 140 kilometres west of Mackay.

The mine is intended for the extraction of high quality hard coking coal for the export market, primarily to Japan and other Asian countries, with some thermal coal by-product.

Subject to obtaining all necessary approvals, mining is expected to commence in 2013, with output progressively increasing over three years to a full production rate of approximately 10 million tonnes per annum of product coal for export.

On 1 March 2011, the Coordinator-General declared the project to be a 'significant project' requiring an environmental impact statement (EIS) under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971*(SDPWO Act).

On 13 January 2011, the Australian Government determined that the project constitutes a controlled action pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The controlling provisions are:

- listed threatened species and communities (EPBC Act, sections 18 and 18A)
- listed migratory species (EPBC Act, sections 20 and 20A).

The declaration of the project as a 'significant project' does not indicate support for, nor approval of, the project by the Coordinator-General or the Queensland Government. Rather, it is a requirement for the project to undergo a rigorous EIS process.

The EIS process is being coordinated by the Queensland Government on behalf of the Coordinator-General.

These terms of reference (TOR) for an EIS have been prepared by the Coordinator-General, incorporating comment by advisory agencies and the public. These TOR will be issued to the proponent as matters to be addressed in the preparation of the EIS.

These TOR are divided into two parts:

- Part A—General information and administrative procedures
- Part B—Contents of the EIS

Part A General information and administrative procedures

1 Project summary

The proposed project includes an open-cut and underground coal mine, located in the Northern Bowen Basin, approximately 20 kilometres west of the mining town of Glenden and 140 kilometres west of the regional centre of Mackay. The proposed mine is located adjacent to and west of the Xstrata Newlands coal mine and north of the Xstrata Wollombi and Suttor Creek coal mines.

The mine is intended for the extraction of high quality hard coking coal for the export market, primarily to Japan and other Asian countries, with some thermal coal by-product.

The project area comprises six mining lease application areas (MLAs), which were lodged on 29 and 30 June 2010, totalling approximately 22 697 hectares. Three of the MLAs are administered by the Charters Towers Regional Mining Registrar of Department of Employment and Economic Development and Innovation (DEEDI)—MLAs 10355 (5411 hectares), 10356 (2203 hectares) and 10357 (1898 hectares), and three of the MLAs are administered by the Emerald Regional Mining Registrar—MLAs 70434 (7731 hectares), 70435 (2560 hectares) and 70436 (2894 hectares). The total available coal resource is approximately 650 million tonnes.

The life of the project is proposed to be 50 years, including construction, operation, decommissioning and rehabilitation. Construction is proposed to commence in 2012, subject to the issue of mining leases and other approvals, and continue for three years. Coal mining is expected to commence in 2013, with output progressively increasing over three years to a full production rate of 15 million tonnes per annum run-of-mine (ROM) coal, from a number of open pits, which equates to approximately 10 million tonnes per annum of product coal for export.

The following mine infrastructure is proposed at the site:

- site water management controls, including sediment control ponds
- coal handling civil works, including ROM pad
- construction and commissioning of coal handling and preparation plant (CHPP)
- construction of the Byerwen Mine rail loop, load-out and connection to the existing Newlands rail line (‘Northern Missing Link’)
- construction of mine infrastructure area including administration, ablution buildings, accommodation village (if required) and vehicle maintenance workshops

- internal haul roads for product haulage, site access roads and a number of overpasses or bridges over existing and proposed railway lines
- construction of process water storage and distribution system
- depot for on-site blasting contractor.

Mining would occur 24 hours per day, 7 days per week, 52 weeks per year. Open-cut mining would be by a combination of large excavator, truck and dozer equipment with potential for drag line operations while any underground mining would be by longwall means. The operational mining schedules are intended to be determined during detailed planning.

ROM coal would be hauled on an internal service road network to a central CHPP designed to handle in excess of 2000 tonnes per hour. Investigations into the use of conveyors for material movement are ongoing.

The project would require a raw water supply of approximately 5400 million litres per year. The proponent has commenced commercial discussions with SunWater regarding water supply via a new 135-kilometre pipeline from downstream of the Burdekin Dam. The pipeline is a construction and operational component of the project.

Initial power requirements for the mine would be met with minor augmentation to the existing 66-kilovolt transmission network to the south of the mine. Long-term power requirements, as the mine reaches full production, would require coordination with power service providers Ergon and Powerlink. These investigations will be undertaken separate to the EIS process.

The coal is proposed to be transported 142 kilometres by rail, using existing capacity on the Newlands rail line, from just north of the Newlands mine, north-east to the Abbot Point Coal Terminal for export.

The project is expected to employ up to 350–500 people during construction and an average of approximately 1000 people during operation, for the life of the project. The proponent has estimated that would generate permanent, indirect employment of approximately 1000 people.

Further information on the project can be viewed at:
www.projects.industry.qld.gov.au

2 Project proponent

The project proponent is Byerwen Coal Pty Ltd, a joint venture between QCoal Pty Ltd (QCoal), which is a Brisbane-based, Queensland-owned and operated coal exploration and mining company, and JFE Steel, which is a subsidiary of the JFE Group of Japan.

The contact details for the proponent are:

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Byerwen Coal Pty Ltd
PO Box 10630, Adelaide Street
Brisbane QLD 4000
tel +61 7 3002 2900
fax +61 7 3002 2999
byerwen@qcoal.com.au
www.qcoal.com.au/page/byerwen_coal_project.html

3 Legislative framework

On 22 November 2010, the proponent applied for a significant project declaration for the project under section 27AA of the SDPWO Act and lodged an initial advice statement (IAS) (dated November 2010) in support of that application.

On 2 February 2011, the proponent provided additional information in the form of a revised IAS (dated 2 February 2011) to support its application for significant project declaration.

On 1 March 2011, the Coordinator-General declared the project to be a 'significant project for which an EIS is required' under section 26(1)(a) of the SDPWO Act. This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires the proponent to prepare an EIS for the project.

On 13 January 2011, the Australian Government Minister for Sustainability, Environment, Water, Population and Communities (Australian Government Environment Minister) determined that the project constitutes a controlled action pursuant to the EPBC Act, due to the likely significant impacts on matters of national environmental significance (MNES) (EPBC 2010/5778). The controlling provisions are:

- listed threatened species and communities (EPBC Act, sections 18 and 18A)
- listed migratory species (EPBC Act, sections 20 and 20A).

On 4 March 2011, the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) decided that the proposed controlled action is to be via the bilateral agreement between the Australian and Queensland governments. This will enable the EIS to meet the impact assessment requirements under both Commonwealth and Queensland legislation. The project will require approval from the responsible Australian Government minister under Part 9 of the EPBC Act before it can proceed.

The Queensland Government has invited relevant Commonwealth, 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 was to develop TOR for an EIS for the project. The process involved formulating draft TOR that were made available for public and advisory agency comment. In finalising these TOR, the Coordinator-General considered all properly made submissions received on the draft TOR and presented copies of the submissions to the proponent. Submissions on the draft TOR were received by the Coordinator-General from 9 April 2011 to 16 May 2011. Eighteen submissions were received during this period—seven from organisations and members of the community and 11 from advisory agencies.

In accordance with section 32(1) of the SDPWO Act, the proponent must provide an EIS that addresses these TOR. The EIS must be acceptable to the Coordinator-General and be provided within two years of these TOR being finalised (unless the Coordinator-General grants an extension in writing, pursuant to section 32(4)(b) of the SDPWO Act).

Once the Coordinator-General accepts the EIS, the proponent must publicly notify its availability in regional and national newspapers, pursuant to section 33 of the SDPWO Act. The notice will state where copies of the EIS can be viewed or purchased, the submission period and where submissions should be sent. After reviewing the EIS, the Coordinator-General may also require the proponent to provide supplementary information to address specific matters raised during the EIS submission period, pursuant to section 35(2) of the SDPWO Act.

At the completion of the EIS phase, the Coordinator-General will prepare a report (Coordinator-General's report) evaluating the EIS and other relevant material, pursuant to section 35 of the SDPWO Act. The Coordinator-General's report will include an assessment and conclusion about the environmental effects of the project. Material that will be assessed includes:

- the EIS
- properly made submissions
- other submissions accepted by the Coordinator-General
- any other material the Coordinator-General considers relevant to the project (e.g. supplementary information, comments and advice from advisory agencies and other entities and technical reports).

The Coordinator-General's report will be publicly notified by placing it on the DEEDI website at **www.deedi.qld.gov.au**. The report will also be presented to the proponent, the assessment manager under the *Sustainable Planning Act 2009* (SPA), the relevant state government advisory agencies and the Australian Government Minister for the Environment.

As the project was determined to be a 'controlled action' under the EPBC Act, the report will also be provided to the Australian Government Environment Minister, who is responsible for administering Part 9 of the EPBC Act.

If the project requires an application for a development approval under SPA, the Coordinator-General's report may, under section 39(1) of the 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 only part of the development
- that the approval must be a preliminary approval only.

Alternatively, under section 39(2) of the SDPWO Act, the Coordinator-General's report must state for the assessment manager that:

- there are no conditions or requirements for the project
- the application for development approval be refused.

Under section 45 of SDPWO Act, the Coordinator-General's report may state conditions for a proposed mining lease(s) under the *Mineral Resources Act 1989* (Qld). If conditions are included in the report, the Coordinator-General must give the minister responsible for the *Mineral Resources Act 1989* a copy of the report.

Under sections 47(c) or 49 of SDPWO Act, the Coordinator-General's report may state conditions for any proposed environmental authority under the *Environmental Protection Act 1994* (Qld) (EP Act). If conditions are included in the report, the Coordinator-General must give the minister responsible for the EP Act a copy of the report.

Note: It is the responsibility of the proponent (or its consultants) to address the requirements of new or amended legislation or policies that come into effect after these TOR have been finalised. This requirement applies regardless of whether or not the legislation or policies are covered in these TOR.

4 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 that adverse impacts are avoided or mitigated. Direct, indirect and cumulative impacts must be fully examined and addressed. The project should be based on sound environmental protection and management criteria.

The EIS document should provide information for the following persons and groups, as the project stakeholders:

- **for interested bodies and persons**—a basis for understanding the project, prudent and feasible alternatives, affected environmental values, impacts that may occur and the measures to be taken to mitigate all adverse impacts
- **for affected persons**—that is, groups or persons with rights or interests in land, as defined under section 38 of the EP Act, or water as defined under the *Water Act 2000* (Qld)—an outline of the effects of the proposed project
- **for government agencies and referral bodies**—a framework for decision-makers to assess the environmental aspects of the proposed 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, subject to what conditions, if any
- **for the proponent**—a mechanism by which the potential environmental impacts of the project are identified and understood, including information to support the development of management measures, such as an environmental management plan (EMP), to mitigate the effects of adverse environmental impacts of the development.

The proponent is required to address these TOR to the satisfaction of the Coordinator-General before the EIS is made publicly available.

5 EIS guidelines

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 adverse impacts. The main EIS report needs to be supported by appendixes containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the proponent must:

- use scientific studies to predict environmental impacts and provide details of their methodology, reliability, and any relevant assumptions or scientific judgements
- present all technical data, sources or authority and other information used to assess impacts
- describe and evaluate proposed measures to mitigate and manage identified issues
- describe qualitatively (in as much detail as reasonably practicable) the residual impacts that are not quantifiable
- discuss the criteria adopted in assessing the proposed project and its impacts (e.g. compliance with relevant legislation, policies, standards, community acceptance)
- ensure the level of investigation of potential/uncertain impacts on the environment is proportionate to both the severity and the likelihood of those events occurring

- adequately address issues that may emerge during the investigations and preparation of the EIS, undertaking the necessary studies and reporting the results
- address all relevant matters concerning environmental values, impacts and proposed mitigation measures for the first time in the main text of the EIS and not in an appendix or the draft EMP
- present adverse and beneficial effects in quantitative and/or qualitative terms as appropriate.

For each identified environmental impact, the EIS must outline the management hierarchy to be applied to address potential impacts on environmental values. These are:

- avoid impacts
- control/mitigation measures
- offset any remaining loss of environmental values.

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

The terms 'describe,' 'detail' and 'discuss' should be taken to include both quantitative and qualitative matters as practical and meaningful. Should the proponent require any information in the EIS to remain confidential, this should be clearly indicated and separate information should be prepared on these matters.

While every attempt has been made to ensure that these TOR address the major issues associated with projects of this type, the final TOR may not be exhaustive. The EIS should also address such matters if either of the following apply:

- environmental or other studies reveal a matter that was not foreseen when these TOR were prepared
- the Coordinator-General directs the proponent (or its consultants), in writing, to address a matter.

6 Stakeholder consultation

The proponent should undertake a comprehensive and inclusive consultation plan with the stakeholders identified in Part A Section 4. Consultation with advisory agencies should be the principal forum for identifying legislation, regulations, policies and guidelines relevant to the project and EIS process.

The public consultation plan should identify broad issues of concern to local and regional community and interest groups and address issues from project planning

through commencement, project operations and decommissioning. The consultation plan should identify:

- the types of consultation and communication activities to be undertaken
- timing of activities
- how it will target the stakeholder/community representatives
- integration with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- reporting and feedback arrangements.

7 EIS format and copy numbers

7.1 General requirements

The EIS should be written in plain English and in a format matching these TOR or include guidelines (preferably as an appendix) describing how the EIS responds to these TOR. Where the project is made up of several components, the EIS should make it clear which project component is being discussed, to allow assessment agencies and other readers to differentiate between the components.

The EIS should contain (as part of the executive summary) a one-page table that explains where readers can find categories of information in the report. This should particularly cover subjects that are presented in multiple places in the EIS.

Include maps, diagrams and other illustrative material in the EIS to assist readers to interpret information.

7.2 Specific format and copy requirements

The proponent must publish the EIS as follows:

(1) On a website that is hosted at the proponent's own expense, in both HTML and PDF formats, as follows:

  (a) pages produced in HTML format must meet the W3C web content accessibility guidelines (available from **www.w3.org**). All cross-references to sections elsewhere in the EIS must be hyperlinked; and all external web links must be hyperlinked.

  (b) PDF files must meet the following requirements:

    (i) no larger than two megabytes in size (documents can be uploaded in sections to meet this requirement)

(ii) text size and graphics files included in the PDF documents should be of sufficient resolution to facilitate reading and enable legible printing

(iii) produced in accordance with Adobe's PDF accessibility best practice guides available at: www.adobe.com/accessibility/products/acrobat/training.html and meet the following minimum accessibility requirements:

A. document structure tags and proper read order

B. searchable text

C. alternative text descriptions

D. security that does not interfere with assistive technology

(2) As a single PDF file on a CD-ROM, DVD or other electronic memory device. This PDF file, which will be read by Queensland Government staff, must include:

(a) bookmarks (links) to all sections of the document (down to five heading levels); and the PDF file must be set to open with the bookmarks showing by default

(b) active (clickable) internal hyperlinks to any pages, sections or diagrams that have been cross-referenced within the EIS

(c) active (clickable) hyperlinks to any external websites/documents that have been included in the EIS.

(3) Provide a PDF version of the executive summary, no larger than two megabytes in size, on a CD-ROM or DVD. This file will be placed on the DEEDI website; and the PDF file must meet the accessibility requirements listed under point (1)(b) above.

(4) Provide all maps/diagrams/figures in JPG format, on a separate CD-ROM, DVD or other electronic memory device. All JPG files should be a minimum of 300 dpi.

(5) Limited copies of the EIS should be produced on A4-size paper capable of being photocopied, with maps and diagrams of A4 or A3 size (discuss this requirement with Queensland Government staff in the early stages of the EIS process).

8 Contact details

For further enquiries about the EIS process for this project, please contact:

EIS project manager - Byerwen Coal Project
Significant Projects Coordination
Office of the Coordinator-General
Department of Employment, Economic Development and Innovation
PO Box 15517 City East Qld 4002
tel + 61 7 3404 6999
fax + 61 7 3225 8282
byerwen@cg.qld.gov.au
www.projects.industry.qld.gov.au

Part B Contents of the EIS

The EIS should follow the format and content outlined in these TOR; however, changes to the structure can be discussed with the EIS project manager.

Executive summary

The executive summary should convey the project's most important aspects and options to the reader in a concise and readable form. It should use plain English, avoid using jargon, be written as a stand-alone document and be structured to follow the EIS. It should be easy to reproduce and distribute on request to interested parties who may not wish to read or purchase the whole EIS.

The executive summary should include:

- project title
- proponent's name and contact details
- 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 and need for the project, including the consequences of not proceeding with the project
- an outline of the alternative options considered and reasons for selecting the proposed development option
- a brief description of the project (pre-construction, construction, operational activities and decommissioning) and the existing environment, using visual aids where appropriate
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies and commitments to minimise the significance of these impacts
- a discussion of the cumulative impacts in relation to social, economic and environmental factors of associated infrastructure projects proposed within the region
- detailed maps of the proposed project location and any other critical figures.

Glossary of terms

Provide a glossary of technical terms, acronyms and abbreviations.

1 Introduction

Clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. Include an overview of the structure of the document.

1.1 Project proponent

Describe the proponent's experience, including the nature and extent of business activities, experience and qualifications, and environmental record, including the proponent's environmental, health, safety and community policies.

1.2 Project description

Briefly describe the key elements of the project, using illustrations or maps. Summarise any major associated infrastructure requirements. Provide detailed descriptions of the project in Part B, section 2.

1.3 Project rationale

Describe the specific objectives and justification for the project, including its strategic, economic, environmental and social implications, technical feasibility and commercial drivers. Discuss the status of the project in a regional, state and national context. Explain the project's compatibility with relevant policy, planning and regulatory frameworks.

1.4 Relationship to other projects

Describe how the project relates to other projects (of which the proponent should reasonably be aware) that have been undertaken, are being undertaken, that have been approved or are proposed in the areas affected by the project including Abbot Point.

As a result of this assessment, there may be opportunities to co-locate existing or proposed infrastructure. Where co-location may be likely, outline opportunities to coordinate or enhance impact mitigation strategies. Discuss the opportunities in sufficient detail to enable the reader to understand the reasons for preferring certain options or courses of action and rejecting others (refer to Part B, subsection 1.5 for more detail).

1.5 Project alternatives

Describe feasible alternatives including conceptual, technological and locality alternatives to the proposed project and the consequences of not proceeding with the project. Detail the criteria used to determine the alternatives and provide sufficient detail to enable the reader to understand why certain options or courses of action are preferred and why others are rejected (including a discussion of the 'no action' option).

Discuss the interdependencies of the project components, particularly in regard to how any infrastructure requirements relate to the viability of the project.

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

As a declared controlled action, compliance with the EPBC Act regulations listed in section 2.01(g) of Schedule 4 of the EPBC Act is required.

1.6 Co-location opportunities

Opportunities may exist to co-locate existing or proposed infrastructure, enabling efficiency gains and mitigating environmental, social and property impacts. Identify any proposals to develop infrastructure within the vicinity of the proposed project. Such proposals would be limited to those projects which are in the public arena during the period of preparation of this EIS and for which a proponent can be readily identified.

While it may be inappropriate for this EIS to evaluate the environmental impacts of other infrastructure not directly required for this project, the EIS should describe the broad implications of locating other forms of linear infrastructure within or near the proposed project infrastructure.

Where co-location may be likely, the EIS should consider opportunities to coordinate or enhance any of the impact mitigation strategies proposed through cooperation with other proponents in the locality. Discuss opportunities in sufficient detail to enable the reader to understand why certain options or courses of action are preferred over others.

1.7 The environmental impact assessment process

1.7.1 Methodology of the EIS

Provide an outline of the environmental impact assessment process, including the role of the EIS in the Coordinator-General's decision making process. Include information on relevant stages of the EIS development, statutory and public consultation requirements and any interdependencies that exist between approvals sought. The information in this section is required to ensure:

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

1.7.2 Objectives of the EIS

Provide a statement of the objectives of the environmental impact assessment process. The structure of the EIS can then be outlined and used to explain how the EIS will meet its objectives. The purpose of the EIS is to:

- provide public information on the need for the project, alternatives to it and options for its implementation
- present the likely effects of the project on the natural, social and economic environment
- demonstrate how environmental impacts can be avoided, managed or mitigated and the offsets for any residual impacts
- provide information for formulating the project's EMP.

1.7.3 Submissions

Inform the reader how to properly make submissions and what form the submissions should take. Advise the reader how and when properly made public submissions on the EIS will be addressed and taken into account in the decision-making process. Also indicate any implications for submissions in the event of any appeal processes.

1.8 Public consultation process

The public consultation process should provide opportunities for community involvement and education through appropriate and timely consultation mechanisms. The public consultation processes (community engagement) for all parts of the EIS should be integrated. It may include:

- interviews with individuals
- public communication activities
- community information sessions held on a variety of days and times to allow working people to attend
- interest group meetings
- production of regular summary information and updates (i.e. newsletters)
- other consultation mechanisms to encourage and facilitate active public consultation.

Outline the methodology that was adopted to:

- identify the stakeholders and how their involvement was facilitated
- identify the processes conducted to date and the future consultation strategies and programs including those during the operational phase of the project
- indicate how consultation involvement and outcomes were integrated into the EIS process and future site activities including opportunities for engagement and provision for feedback and action if necessary.

List the stakeholders consulted during the program and provide details of any meetings held, presentations made and any other consultation undertaken for the EIS process.

Provide information about the consultation process that has taken place and the results.

1.8.1 Public consultation plan

The public consultation plan should identify broad issues of concern to local and regional community and interest groups and address issues from project planning through commencement, project operations and decommissioning. The consultation plan should identify:

- the types of consultation and communication activities to be undertaken
- timing of activities
- how it will target the stakeholder/community representatives
- integration with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- reporting and feedback arrangements.

1.9 Project approvals

1.9.1 Relevant legislation and approvals

For each key project component, list and describe Commonwealth, state and local legislation and regulations relevant to the planning, approval, construction and operation and decommissioning of the project.

Identify approvals, permits, licences and authorities that will need to be obtained for the proposed project. Outline the head of power, administrative agency and project triggers for the application of each of these and identify relevant approval requirements.

Where relevant, refer to applicable Commonwealth legislation, which may include but is not limited to:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environmental Protection (Sea Dumping) Act 1981*
- *Great Barrier Reef Marine Park Act 1975*
- *Native Title Act 1993.*

Identify and outline relevant Commonwealth obligations such as:

- protection of World Heritage values
- migratory animals (China–Australia Migratory Bird Agreement, Japan–Australia Migratory Bird Agreement, Republic of Korea–Australia Migratory Bird Agreement and Bonn Convention)
- biodiversity
- climate
- wetlands of international importance (Ramsar Convention).

Where relevant, refer to applicable Queensland legislation, which may include but is not limited to:

- *Aboriginal Cultural Heritage Act 2003*
- *Building Act 1975*
- *Coal Mining Safety and Health Act 1999*
- *Coastal Protection and Management Act 1995*
- *Dangerous Goods Safety Management Act 2001*
- *Electricity Act 1994*
- *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Food Act 2006*
- *Greenhouse Gas Storage Act 2009*
- *Land Act 1994*
- *Land Protection (Pests and Stock Route Management) Act 2002*
- *Maritime Safety Queensland Act 2002*
- Maritime Safety Queensland Regulation 2002
- *Mineral Resources Act 1989*
- *Native Title (Queensland) Act 1993*
- *Nature Conservation Act 1992*
- *Queensland Heritage Act 1992*
- *State Development and Public Works Organisation Act 1971*
- *Sustainable Planning Act 2009*
- *Transport Infrastructure Act 1994*
- *Transport Operations (Marine Safety) Act 1994*
- Transport Operations (Marine Safety) Regulation 2004
- *Transport Operations (Marine Pollution) Act 1995*

- *Transport Operations (Marine Pollution) Regulation 2008*
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Planning and Coordination Act 1994*
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Planning and Coordination Act 1994*
- *Vegetation Management Act 1999*
- *Water Act 2000*
- *Workplace Health and Safety Act 1995.*

1.9.2 Relevant plans and policies

Outline the project's consistency with the existing national, state, regional and local planning and policy framework that applies to the project location. Refer to all relevant statutory and non-statutory plans, planning policies, guidelines, strategies, development schemes, land use plans and agreements including but not limited to the following:

- Assess the project against relevant policies and provisions of the draft Mackay. Issac and Whitsunday Regional Plan [1] and the draft Mackay, Issac and Whitsunday State Planning Regulatory Provisions[2].
- Assess the project against the *Water Resource (Burdekin Basin) Plan 2007* [3] as it may have implications for the project as it regulates the take of overland flow water and watercourse water in the Burdekin Basin.

1.9.3 Environmentally relevant activities

Briefly describe each environmentally relevant activity (ERA) and associated activities that are to be carried out in connection with each key component of the project. Present a detailed description of each ERA in Section 3: Environmental values and management of impacts; and provide details of the impact on land, water, air, noise and any other relevant environmental values.

For example, should ERA 14—electricity generation be undertaken on the mining tenure, the proponent must identify if the plant will or intends to be connected to the state power network grid. Electricity generation undertaken on a mining tenure that is, or intends to be, connected to the state power network grid will require a separate development permit. Electricity generation undertaken on a mining tenure and

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[1] Department of Local Government and Planning, *Draft Mackay. Issac and Whitsunday Regional Plan*, viewed 2 June 2011, http://www.dlgp.qld.gov.au/regional-planning/draft-mackay-isaac-and-whitsunday-regional-plan.html
[2] Department of Local Government and Planning, Draft Mackay. Issac and Whitsunday State Planning Regulatory Provisions viewed 2 June 2011, http://www.dlgp.qld.gov.au/regional-planning/draft-mackay-isaac-and-whitsunday-state-planning-regulatory-provisions-2010.html
3 *Water Resource (Burdekin Basin) Plan 2007* Subordinate Legislation 2007 No. 189 made under the *Water Act 2000*, viewed 2 June 2011, http://www.legislation.qld.gov.au/LEGISLTN/SLS/2007/07SL189.pdf

utilised solely for mining activities contained within the mining tenure can be permitted under a mining environmental authority.

The above information will allow for informed decisions to be made on the project, consistent with the provisions of the EP Act.

1.9.4 Accredited process for controlled actions under Commonwealth legislation

The EIS will be developed pursuant to the bilateral agreement between the Commonwealth and Queensland governments for the purposes of the Australian Government's assessment under Part 8 of the EPBC Act. The EIS should address potential impacts on the MNES that were identified when the project was determined to be a controlled action.

Section 9 of these TOR outlines the requirements in relation to this matter.

2 Description of the project

Describe the project through its lifetime of pre-construction, construction, operation and potentially 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 the project

Provide an overview of the project to put it into context. Include:

- a rationale explaining the selection of the preferred operating scenario, including details such as cost, environmental impacts, and the operational efficiencies of each option
- a description of the key components of the project including the use of text and design plans where applicable
- a summary of any environmental design features of the project
- details of the expected cost, timing, and overall duration of the project, including details of and justification for, any staging of the development.

2.2 Location

Describe, using maps at suitable scales and level of detail, the state, regional and local context of all of the key project components and all associated infrastructure. Provide real property descriptions of the project. Maps should show the precise location of the project area, in particular the:

- location and boundaries of current or proposed land tenures that the project area is or will be subject to, and details of the ownership of that land

- location and boundaries of the project footprint, including easement widths and access requirements
- location of any proposed buffers surrounding the working areas (for construction and operation)
- location of infrastructure (existing or proposed) relevant to the project such as the state-controlled road network, construction activities, accommodation villages, internal haul roads, crossings of rail lines and access locations (existing and proposed) to the state-controlled road network (if applicable)
- areas of mining leases that include the state-controlled road network
- location of natural features such as waterways (e.g. rivers, streams, creeks, other water bodies and wetlands) and shorelines
- location of any proposed project infrastructure requirements (e.g. site offices and accommodation sites, alignment of water pipelines) with reference to size, type and use, during all project stages
- views to and from the site.

Provide GPS coordinates of the location of project infrastructure and the project area where available.

2.3 Construction

Provide the following information on the pre-construction, construction and commissioning of all key components of the project including detailed plans where appropriate.

2.3.1 Pre-construction activities

Describe all pre-construction activities, including:

- approvals required for this stage, including any resource allocations (e.g. water supply, land access)
- land acquisitions and/or tenures required
- nature, scale and timing for vegetation clearing
- site access
- earthworks
- interference with watercourses and floodplain areas, including wetlands
- site establishment requirements for construction facilities, including access restriction measures and expected size, source and control of the construction workforce accommodation, services (water, sewage, communication, power, transport and traffic, waste management and recreation) safety and emergency requirements, for example a landing site for helicopter and/or fixed wing aircraft
- temporary works

- upgrade, relocation, realignment, deviation of or restricted access to roads and other infrastructure.

2.3.2 Construction

Describe all the construction elements of the project, including:

- an indicative construction timetable, including expected commissioning and start-up dates and hours of operation
- major work programs for the construction phase, including an outline of construction methodologies
- construction equipment to be used
- construction inputs, handling and storage, including an outline of potential locations for source of construction materials
- major hazardous materials to be transported, stored and/or used on site, including environmental toxicity data and biodegradability
- clean-up and restoration of areas used during construction, including camp site(s) and storage areas.

2.3.3 Commissioning

Describe the commissioning process including the associated environmental impacts.

2.4 Water resources infrastructure

2.4.1 On-site water supply infrastructure

Provide information on water usage by the project, including the quality and quantity of all water supplied to and distributed within the site. In particular, the proposed and optional sources of water supply should be described (e.g. bores, surface storages, municipal water supply pipelines, coal seam gas water). Provide estimated rates of supply from each source (average and maximum rates). Describe any proposed water conservation and management measures.

Determine potable water demand for the project, including the temporary demands during the construction period ensuring compliance with the *Australian Drinking Water Guideline 2004*[4].. Provide details of any existing town water supply to meet such requirements. If water storage and treatment is proposed on site, for use by the site workforce and in accommodation camps, then this should be described, identifying how potable water will be supplied, treated, stored, protected and monitored.

[4] National Health and Medical Research Council *Australian Drinking Water Guideline 2004* , viewed 2 June 2011 http://www.nhmrc.gov.au/publications/synopses/eh19syn.htm

2.4.2 Water supply infrastructure

Provide information on infrastructure required to supply water to the project, for example, pipelines from water supplies to the project. Assess and discuss the impacts of such infrastructure as part of the project, for each of the relevant '**Error! Reference source not found.**' subsections outlined in **Error! Reference source not found.** of these TOR.

Describe the process and criteria used to select the preferred design and preferred construction techniques for water supply infrastructure to the project, including:

- the method of extracting and/or releasing water from the storage
- any treatment methods proposed, including disposal of treated waste
- if distribution is by pipe:
  - provision for route refinement and right of way
  - pipeline design parameters, including capacity and design life
  - above-ground facilities—physical dimensions and construction materials for surface facilities along the pipeline route, including information on pipeline markers
  - the location and/or frequency of (if applicable) cathodic protection points, off-take valves, pump stations, balance tanks, control valves (isolation points), pigging facilities and any other project facilities and linkages to existing water supply infrastructure along the pipeline route
  - description of pipeline maintenance measures
  - design measures to prevent inter-basin transfer of aquatic flora and fauna.

2.5 Operation

Provide full details of the operation for all elements of the project, including:

- a description of the project site, including concept and layout plans of buildings, structures, plant and equipment to be employed
- nature and description of all key operational activities
- the capacity of the project equipment and operations
- estimated numbers and roles of persons to be employed during the operational phase of the project.
- proposed sequencing and timing of mining within the mining lease
- physical extent of excavations, location of stockpiles of overburden and/or coal reject to be handled, including the rate of throughput of stockpiles of product, reject and overburden
- the area disturbed at each major stage of the project

- the proposed mine life and an outline of the coal base
- the planned recovery of resources
- locations of any resources that would be sterilised by the planned activities
- the quantity of coal to be mined annually, including any proposed ramping of production or staging of development.

2.6 Associated infrastructure

In addition to water supply infrastructure, detail, with the aid of concept and layout plans, requirements for new infrastructure or upgrading/relocating existing infrastructure to service the project. Consider infrastructure such as transportation (road, rail, air and sea), accommodation, energy supply, telecommunications, stormwater, waste disposal and sewerage.

2.6.1 Road transport

Provide information on road transportation requirements on public roads (both state and local) for both construction and operations phases, including:

- any proposed new roads or road upgrades and resulting road relocations to provide access to, or within, the mine and associated infrastructure (e.g. water supply pipeline and workforce construction camps)
- existing traffic levels including vehicle types and numbers and trip lengths
- construction traffic (including vehicle types, number of vehicles trips including any workforce generated, service vehicle or over-dimensional trips
- operational traffic (including vehicle types, number of vehicles trips including any workforce generated service vehicle, maintenance vehicle or over-dimensional vehicle trips), across various stages of the project's development
- anticipated times at which movements may occur
- proposed transport routes (including any waterway crossings)
- need for increased road (and any waterway crossings) maintenance and upgrading
- need for increased road maintenance
- communication of these issues to the public.

More detailed information regarding road transport infrastructure will be required in accordance with Part B, subsection 3.10 (Transport) of these TOR. The EIS should be cross-referenced accordingly.

2.6.2 Rail transport

Provide information on rail transportation and infrastructure requirements for both construction and operational phases, including:

- the proposed new railway components (including easements and ownership arrangements) to provide access to project sites
- analysis and design plans for any interface with the Newlands rail line
- proposed transport routes of all project-related transport movements associated with rail (including associated infrastructure such as railway crossings)
- need for increased rail crossing maintenance and upgrading
- all rail infrastructure required to be constructed, upgraded, relocated, commissioned or decommissioned for the construction and/or operation of the project, including the design and construction standards to be met.

Provide details of the associated rail infrastructure component of the project, including rail loop and connection to the Newlands rail line, showing the:

- location of the rail corridor, railway and associated rail infrastructure
- location and boundaries of land tenures, in place or proposed, to which the rail component is or will be subject
- point of interface between the main rail corridor, branch line and proposed balloon loop (including the Newlands rail line, state-controlled roads, local roads, any other proposed rail infrastructure and other infrastructure such as pipelines)
- location and boundaries of the rail project footprint showing all key aspects including excavations, stockpiles, areas of fill, watercourses, bridges, culverts, hardstands, open-level crossings and occupational crossings etc.
- location of all proposed project rail transport and coal-loading infrastructure.

More detailed information regarding rail transport infrastructure will be required in accordance with Part B, subsection 3.10 of these TOR (Transport). The EIS should be cross-referenced accordingly.

2.6.3 Energy

Describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the project. Outline the power infrastructure required and the process to construct this infrastructure.

Show the locations of any easements on the infrastructure plan.

Describe energy conservation in the context of any Commonwealth, Queensland and Local Government policies.

2.6.4 Telecommunications

Describe all telecommunications requirements for the construction and operation of the project.

Provide details and location of any existing telecommunications infrastructure, such as optical cables and microwave towers, that might be impacted by the project and identify the owners of that infrastructure.

2.6.5 Stormwater drainage

Describe the proposed stormwater drainage system and the proposed disposal arrangements.

Provide supporting figures, with contours at suitable intervals (one-metre contours in areas of low relief) showing drainage pathways and the locations and discharge points of sediment detention basins, and any other stormwater quality improvement devices.

2.7 Decommissioning and rehabilitation

Describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by the project, including:

- developing a preferred rehabilitation strategy with a view to minimising the amount of land disturbed at any one time
- illustrating the final topography of any excavations, waste areas and dam sites on maps at a suitable scale
- describing the means of decommissioning the project—in terms of removing equipment, structures and buildings—and the methods proposed for stabilising the affected areas
- discussing options and methods for disposing of wastes generated by demolishing project infrastructure, including sufficient detail for their feasibility and suitability to be established
- discussing future land tenure arrangements post-decommissioning of the project.

Include the impacts of the preferred rehabilitation strategy in the appropriate subsections of Part B, subsection 3 (Environmental values and management of impacts).

Refer also to infrastructure that is not intended to be decommissioned. In this situation, describe the entity to which the infrastructure is intended to be transferred, and the proposed environmental management regimes.

Describe in detail a conceptual closure plan to achieve best practice mine decommissioning. Outline what provisions will be made during operations to achieve the standards and completion criteria for mine decommissioning as consistent with the *Strategic Framework for Mine Closure*[5].

[5] Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia, *Strategic Framework for Coal Mine Closure 2000*, viewed 31 May 2011, http://www.dmp.wa.gov.au/documents/Shed_env_guide_closure.pdf

3 Environmental values and management of impacts

Detail the environmental protection and mitigation measures incorporated in the planning, construction, rehabilitation, commissioning, operations and decommissioning of all facets of the project. Measures should prevent, or where prevention is not possible, minimise environmental harm and maximise environmental benefits of the project. Identify and describe preferred measures in more detail than other alternatives.

The objectives of the following subsections are to:

- describe the existing environmental values of the area that may be affected by the project, using background information and/or new studies to support statements (include reference to all definitions of environmental values set out in relevant legislation, policies and plans)
- describe the potential adverse and beneficial impacts of the project on the identified environmental values and the measures taken to avoid, minimise and/or mitigate those impacts
- describe any cumulative impacts on environmental values caused by the project, either in isolation or in combination with other known existing or planned projects
- present objectives, standards and measurable indicators that protect the identified environmental values
- examine viable alternative strategies for managing impacts (present and compare these alternatives in view of the stated objectives and standards to be achieved)
- discuss the available techniques to control and manage impacts in relation to the nominated objectives.

Information is required to show that measures have been taken to avoid and minimise potential adverse impacts of the project. Environmental offsets may be proposed, consistent with the *Queensland Government Environmental Offsets Policy*.[6]

Define and describe practical measures for achieving the objectives for protecting and enhancing environmental values including:

- monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting methods
- auditing programs: describe how progress towards achieving the objectives will be measured

[6] Environmental Protection Agency, *Queensland Government Environmental Offsets Policy 2008*, Department of Environment and Resource Management, viewed 2 June 2011, www.derm.qld.gov.au/register/p02501aa.pdf

- management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented for each element of the environment.

The EIS should follow the format and content outlined in these TOR; however, changes to the structure can be discussed with the EIS project manager. The mitigation measures, monitoring programs etc., identified in this section of the EIS should be used to develop the EMP for the project (see Part B, section 8, Environmental management plan).

3.1 Climate, natural hazards and climate change

Describe the climatic conditions that may affect management of the project. This includes a description of the vulnerability of the project area to seasonal conditions, extremes of climate and natural or induced hazards. Provide a risk assessment and management plan detailing these potential threats to the construction and operation of the project.

Discuss extremes of climate (droughts, floods, cyclones etc.), with particular reference to water management at each component site of the project, and address the vulnerability of the area to natural or induced hazards, such as floods and bushfires. Consider the relative frequency and magnitude of these events together with the risk they pose to managing the project.

Address the most recent information on potential impacts of climatic factors in the appropriate sections of the EIS.

Include an assessment of climate change risks and possible adaptation strategies, as well as the following:

- a risk assessment of changing climate patterns that 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.

3.1.1 Flood plain management

Description of environmental values

Due to the location of the site, a comprehensive flood study should be included in the EIS that includes:

- quantification of flood impacts on properties surrounding and external to the project site from redirection or concentration of flows
- identification of likely increased flood levels, increased flow velocities or increased time of flood inundation as a result of the development.

The flood study should address any requirements of local or regional planning schemes for flood affected areas. The study report should include details of all calculations along with descriptions of base data, any potential for loss of flood plain storage, and triangulated surface meshes produced in terrain modelling software. Refer to any studies undertaken by the local council in relation to flooding.

Describe how *State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*[7] would be addressed in the context of managing flood impacts.

Potential impacts and mitigation measures

Provide details on the:

- potential impacts of floods at a range of flood intervals, including the probable maximum flood event
- potential impacts of flooding on environmental values due to the identified likely increased flood levels, increased flow velocities or increased time of flood inundation as a result of the project
- impacts and mitigation measures for flooding (describe the construction of any flood protection levees with regards to construction material, design and methods).

3.2 Land

Detail the existing land environment values for all areas associated with the project. Describe the potential for the construction and operation of the project to change existing and potential land uses of the project sites and adjacent areas.

3.2.1 Land use and tenure

Description of environmental values

Identify, with the aid of maps:

- land tenure, including reserves, tenure of special interest such as protected areas and forest reserves, existing and proposed gas infrastructure, port infrastructure, water pipelines, power lines and transport corridors, including local roads, State-controlled roads and rail corridors
- existing land uses and facilities surrounding the project components
- the land use designation of the affected and surrounding land according to the relevant planning scheme, development scheme or other planning instrument

[7] Department of Local Government and Planning, Department of Emergency Services, *State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, 2003, viewed 2 June 2011, www.emergency.qld.gov.au/publications/spp/pdf/spp.pdf

- areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative body(ies), and whether it is necessary to notify the representative body(ies) or if there is evidence that native title does not exist
- distance of the project from residential and recreational areas
- declared water storage catchments
- location of the project in relation to environmentally sensitive areas
- existing stock routes (if any) affected by the project components.

Potential impacts and mitigation measures

Detail the potential for the construction, operation and decommissioning of the project to change existing and potential land uses of the project site, adjacent areas and affected areas.

Describe the following:

- impacts on surrounding land uses and human activities and strategies for minimisation, such as:
  - good quality agricultural land (GQAL)—refer to *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*[8] and its accompanying *State Planning Policy 1/92 Guideline: The Identification of Good Quality Agricultural Land*[9]
  - strategic cropping land—refer to *Protecting Queensland's Strategic Cropping Land: A Policy Framework*[10]
  - key resource areas—refer to *State Planning Policy 2/07: Protection of Extractive Resources*[11] and its accompanying *State Planning Policy 2/07 Guideline: Protection of Extractive Resources*[12]
  - residential and industrial uses.
- where the project conflicts with the existing land uses of the affected and adjoining land parcels, and mitigation strategies to minimise the adverse impacts of this land use conflict

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[8] Department of Housing, Local Government and Planning and Department of Primary Industries, State Planning Policy 1/92: Development and the Conservation of Agricultural Land, 1992, viewed 2 June 2011, www.dlgp.qld.gov.au/docs/ipa/spp1_92.pdf

[9] Department of Primary Industries and Department of Housing, Local Government and Planning, *Planning guidelines: The identification of good quality agricultural land*, 1993. viewed 2 June 2011 http://www.dlgp.qld.gov.au/docs/ipa/plng_guide_identif_ag_land.pdf

[10] Department of Environment and Resource Management, *Protecting Queensland's Strategic Cropping Land: A Policy Framework*, Department of Environment and Resource Management, 2010, viewed 12 May 2011, www.derm.qld.gov.au/land/planning/strategic-cropping/policy-document.html

[11] Department of Mines and Energy, *State Planning Policy 2/07: Protection of Extractive Resources*, 2007, viewed 2 June 2011, www.dme.qld.gov.au/mines/state_planning_policy.cfm#policy

[12] Department of Mines and Energy, *State Planning Policy 2/07 Guideline: Protection of Extractive Resources*, Department of Mines and Energy, 2007.

- where the project conflicts with the land use designations of the relevant statutory planning instruments, including but not limited to, planning schemes, development schemes, state planning policies and regulatory provisions
- where the project may conflict with other proposed development or non-statutory plans
- management of the immediate environs of the project including construction buffer zones
- the potential native title rights and interests likely to be impacted upon by the project and the potential for managing those impacts by an Indigenous land use agreement or other native title compliance outcomes
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services. Outline mitigation strategies to minimise adverse impacts of the construction and operation of the project on these services
- potential impacts on future road upgrades. Propose mitigation strategies to avoid or minimise adverse impacts of the project on proposed road upgrades
- impacts or disruptions to the stock route network (if any). Present options for mitigation of these impacts including realignment/replacement of corridors of similar width and suitable country type to allow for the uninterrupted flow of travelling stock, options for diverting stock, watering facilities and other infrastructure
- any land units requiring specific management measures.

Detail post-operations land use options, including suitability of the area to be used for agriculture, industry, or nature conservation. Detail the factors favouring or limiting the establishment of those options, in the context of land use suitability prior to the proposal and minimising potential liabilities for long-term management.

Describe 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. If the development adjoins or potentially impacts on GQAL, then an assessment of the potential for land use conflict is required. Investigations should follow the procedures set out in *Planning guidelines: The Identification of Good Quality Agricultural Land*,[13] which supports *State Planning Policy 1/92*.

[13] Department of Primary Industries and Department of Housing, Local Government and Planning, *Planning guidelines: The identification of good quality agricultural land*, 1993.

Outline incompatible land uses, whether existing or potential, affected by or adjacent to all aspects of the project, including essential and proposed ancillary developments or activities. Identify areas directly or indirectly affected by the construction and operation of these activities and define measures to avoid unacceptable impacts and/or mitigation strategies to minimise adverse impacts of the project.

3.2.2 Topography, geology and soils

Description of environmental values

Provide maps locating the project in state, regional and local contexts. The topography should be detailed with contours at suitable increments, shown with respect to Australian height datum. Include significant features of the landscape and topography, and accompanying comments on the maps.

Provide a description, map and a series of cross-sections of the geology of the project area relevant to the project components. Describe the geological properties that may influence ground stability, occupational health and safety, or the quality of stormwater leaving any area disturbed by the project. In locations where the age and type of geology is such that significant fossil specimens may be uncovered during construction/operations, address the potential for significant finds.

Soil resources

A soil survey of the sites affected by the project must be conducted at a scale of at least 1:50,000 or larger, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, stormwater run-off quality, rehabilitation and agricultural productivity of the land. Provide information on soil stability and suitability for construction of project facilities.

Describe and map soils at a suitable scale and according to the *Australian soil and land survey field handbook*,[14] *Guidelines for Surveying Soil and Land Resources*[15] and *Australian soil classification*.[16]

Appraise the depth and quality of useable soil and present information according to the standards required in the *Planning guidelines: The identification of Good Quality Agricultural Land*[17] and *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*[18] and assess each soil's agricultural land suitability in accordance with *Guidelines for agricultural land evaluation in Queensland*.[19]

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[14] National Committee on Soil and Terrain, *Australian soil and land survey field handbook*, 3rd edn, CSIRO Publishing, Collingwood, 2009.
[15] NJ McKenzie et al. *Guidelines for Surveying Soil and Land Resources*, 2nd edn, CSIRO Publishing, Melbourne, 2008.
[16] R Isbell, *Australian soil classification*, CSIRO Publishing, Melbourne, 2002.
[17] Department of Primary Industries and Department of Housing, Local Government and Planning, *Planning guidelines: The identification of good quality agricultural land*, 1993.
[18] Department of Housing, Local Government and Planning and Department of Primary Industries, *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*, 1992.
[19] Land Resources, *Guidelines for agricultural land evaluation in Queensland*, Land Resources, 1990.

Soil profiles should be described according to the *Australian soil and land survey field handbook* [20], grouped according to their parent material and position in the landscape, and classified according to the *Australian soil classification* [21]. 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 should be included.

Representative soils must be sampled down the profile for laboratory analysis as outlined in the *Land Suitability Assessment Techniques*. Discuss soil profile classes in terms of those mapped and reported in *Land Suitability Study of the Collinsville–Nebo–Moranbah Region* [22].

For pipeline routes, undertake the analysis and classification at least to the depth of excavation. Provide geotechnical information on the soils' stability and suitability for construction of project facilities.

Undertake an assessment and document the depth and quality of useable topsoil and subsoil to be stripped and stockpiled for rehabilitation.

Provide geotechnical information on soil stability and suitability for construction of proposed facilities.

Assess the suitability of the soils mapped in the project area for rain fed broadacre cropping and beef cattle grazing according to the limitations and land suitability classification system in Attachment 1 of *Land Suitability Assessment Techniques* in *the Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland*[23].

Provide land suitability maps of the mapped soil units and an Agricultural Land Class map according to the *Planning Guideline: The Identification of Good Quality Agricultural Land* [24].

Discuss the GQAL status and comment on and justify any variation with the GQAL mapping shown in the Whitsunday Regional Council and Issac Regional Council Planning Schemes.

Mineral resources

Summarise the results of studies and surveys undertaken to identify and delineate the mineral resources within the project area (including any areas underlying related infrastructure).

Describe in detail, as indicated in the dot points below, the location, tonnage and quality of the mineral resources within the project area. The mineral resources should be estimated and reported in accordance with the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* (the JORC

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[20] National Committee on Soil and Terrain, *Australian soil and land survey field handbook,* 2009, 3rd edition,
[21] Isbell, R,, *Australian soil classification, Australian Soil and Land Survey Handbook Series 4,* 2002
[22] Shields,P.G., *Land Suitability Study of the Collinsville – Nebo – Moranbah Region* 1984
[23] Queensland Mining Council, *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland 1995.*
[24] Department of Primary Industries and Department of Housing Local Government and Planning, *Planning Guideline: The Identification of Good Quality Agricultural Land,* 1993 , viewed 2 June 2011 http://www.derm.qld.gov.au/register/p01206aa.pdf

Code)[25] and the principles outlined in the *Australian Guidelines for the Estimating and Reporting of Inventory Coal, Coal Resources and Coal Reserves*[26] as appropriate.

In addition provide maps (at appropriate scales) showing the general location of the project area and in particular the:

- location and aerial extent of the mineral resources to be developed or mined
- location and boundaries of mining tenures, granted or proposed, to which the project area is, or will be subject
- location of the proposed mine excavation(s)
- location and boundaries of any project sites
- location and boundaries of any other features that will result from the proposed mining including waste/spoil dumps, water storage facilities and other infrastructure
- location of any proposed buffers, surrounding the working areas
- any part of the resource not intended to be mined and any part of the resource that may be sterilised by the proposed mining operations or infrastructure.

Potential impacts and mitigation measures

Provide details of any potential impacts to the topography or geomorphology associated with the project and proposed mitigation measures, including:

- a discussion of the project in the context of major topographic features and any measures taken to avoid or minimise impact to such, if required
- the objectives to be used for the project in any re-contouring or consolidation, rehabilitation, landscaping, and fencing.

Identify the possible soil erosion rate for all permanent and temporary landforms and describe the techniques used to manage the impact.

Identify all soil types and outline the erosion potential (both wind and water) and erosion management techniques to be used.

Provide details of an erosion-monitoring program (including rehabilitation measures for erosion problems identified during construction), and detail acceptable mitigation strategies.

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[25] Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia, *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore reserves*, Joint Ore Reserves Committee, 2004, viewed 2 June 2011, www.jorc.org/main.php

[26] Coalfields Geology Council of New South Wales and the Queensland Mining Council, *Australian Guidelines for the Estimating and Reporting of Inventory Coal, Coal Resources and Coal Reserves*, Joint Ore Reserves Committee, 2003, viewed 2 June 2011, www.jorc.org/pdf/coalguidelines.pdf

Include an assessment of likely erosion effects, especially those resulting from removing vegetation, and constructing retaining walls both on site and off site for all disturbed areas.

Summarise methods proposed to prevent or control erosion with regard to:

- the *Soil Erosion and Sediment Control—Engineering Guidelines for Queensland Construction Sites*[27]
- the *Guideline: EPA Best Practice Urban Stormwater Management—Erosion and Sediment Control*[28]
- preventing soil loss in order to maintain land capability/suitability
- preventing degradation of local waterways.

Discuss the potential for acid generation by disturbing potentially acid forming materials during earthworks and construction. Discuss measures for managing potentially acid forming materials and mitigating impacts for all site earthworks and construction activities. Should action criteria be triggered by acid generating potential as a result of testing, outline management measures in an acid mine drainage management plan, prepared in accordance with the assessment and management of acid drainage guideline of the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* series,[29] *Managing Acid and Metalliferous Drainage*[30] and any other applicable best practice guidelines.

Discuss the potential for acid, saline, neutral or alkaline drainage from waste dumps. Characterise the potential quality of leachate from the mined waste under field conditions, including contaminants such as sulfate, pH, chloride, iron, major cations and anions, and any chemical species in sufficient quantity that is likely to cause environmental harm including nuisance.

Resource utilisation

Analyse the effectiveness of the mining proposal in achieving the optimum utilisation of the coal/mineral resources within the project area and consider its impacts on other resources. Demonstrate that the mining proposal will 'best develop' the mineral resources within the project area, minimise resource wastage and avoid any unnecessary sterilisation of these or any other of the state's coal, mineral, and petroleum (including gas and coal seam methane) resources that may be impacted upon or sterilised by the mining activities or related infrastructure.

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[27] Institution of Engineers Australia, *Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites*, Institution of Engineers Australia Queensland Division, Brisbane, 1996.
[28] Environment Protection Agency, *Guideline: EPA Best Practice Urban Stormwater Management – Erosion and Sediment Control*, 2008, viewed 2 June 2011, www.derm.qld.gov.au/register/p02301aa.pdf
[29] Department of Minerals and Energy, *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland*, Department of Mines and Energy, 1995, viewed 2 June 2011, www.derm.qld.gov.au/environmental_management/land/mining/technical_guidelines.html
[30] Department of Industry, Tourism and Resources, *Managing acid and metalliferous drainage: Leading Practice Sustainable Development Program for the mining industry*, Department of Industry, Tourism and Resources, Canberra, 2007, viewed 3 June 2011, www.ret.gov.au/resources/Documents/LPSDP/LPSDP-AcidHandbook.pdf

Subsidence

Provide comprehensive surface subsidence predictions, taking into account factors such as topographic variations and geological complexities, with a full description of the methodology and an assessment of the reliability of the predictions. Show the results of the predictions on maps with one-metre contour increments and a scale appropriate for assessing surface subsidence impacts.

Provide a detailed description of subsidence effects on surface and groundwater hydrology as well as on terrestrial ecosystems (including which vegetation communities and flora species are most likely to be effected by changes to surface hydrology).

Propose mitigation measures to deal with any significant impacts that would result from subsidence. The EIS and EMP should provide a detailed subsidence management plan for remediation and monitoring of subsidence cracking and ponding, with an emphasis on limiting the impact to remnant vegetation habitats.

Land disturbance

Develop a strategy that will minimise the amount of land disturbed at any one time. Describe the strategic approach to progressive rehabilitation of landforms and final decommissioning. Describe the methods to be used for the proposal, including backfilling, covering, re-contouring, topsoil handling and revegetation.

Where waterways are proposed to be diverted, describe the impact on land use due to hydrology changes, both upstream and downstream. Also, detail the final drainage and seepage control systems and any long-term monitoring plans.

Also describe:

- rehabilitating diverted creeks during operations and reinstating the creeks after operations cease
- removing dams or transferring responsibility for dams to the landholder and ongoing dam management
- the final drainage and seepage control systems
- the rehabilitation objectives, indicators and completion criteria.

Describe the transfer of responsibility to the landholder and the ongoing maintenance and monitoring that would be required for any features of mining activity, such as dams, levee banks, waterway diversions, other waterway barriers and other infrastructure that would remain after the mine is decommissioned.

Demonstrate where final voids and uncompacted overburden and workings at the end of mining would lie in relation to flood levels up to and including the ‘probable maximum flood level’, based on the Bureau of Meteorology’s ‘probable maximum precipitation’ forecast for the locality from nearby watercourses such that the protection is sustainable for the foreseeable future. Management and maintenance

arrangements should be supported by appropriate erosion and stability monitoring to substantiate long-term rehabilitation sustainability.

The EIS should include, but not be limited to, the following details:

- the predicted storage capacity of void water during annual exceedence probability 1 in 25, 1 in 50, 1 in 100, 1 in 200 and 1 in 1000-year rainfall events and potential for discharge
- the predicted quality of void water during potential release events
- the predicted impact on the environment caused by the release of any void water
- modelling and assessment of practicable management measures to mitigate contaminant increases in storage dams
- a monitoring program to be undertaken both during and after mining, to assess the performance of the proposed management measures
- the ability of the final void water to meet the rehabilitation criteria—being safe, stable and non-polluting.

Where dams, roads, levee banks, waterway diversions and other infrastructure are to remain upon project decommissioning, provide proposals to manage and maintain these structures. Management and maintenance arrangements should be supported by appropriate erosion and stability monitoring to substantiate long-term rehabilitation sustainability.

Assess the mitigation measures for land disturbance to be used on decommissioning the site, providing sufficient detail to decide their feasibility. In particular, address the long-term stability of final voids and spoil dumps, safety of access to the site after surrender of the lease, and the residual risks that will be transferred to the subsequent landholder.

Describe the strategy that will be used to manage topsoil, considering transport, storage and replacement of topsoil to disturbed areas. Also, outline how soil from GQAL will be best used. Address the minimisation of topsoil storage times (to reduce fertility degradation). Describe erosion and sediment control measures, particularly in relation to managing sodic and saline overburden material.

3.2.3 Land contamination

Description of environmental values

Include:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the EP Act
- identification of any potentially contaminated sites not on the registers that may need remediation
- areas of contamination on or adjacent to the project area

- a description of the nature and extent of contamination at each site.

Potential impacts and mitigation measures

Discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*[31] and the *National Environment Protection (Assessment of Site Contamination) Measure 1999*.[32]

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. Identify and quantify, where possible, hazards and risks, considering cumulative impacts, and explain how these hazards and risks will be managed.

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 management of chemicals and fuels to prevent spills or leaks.

State any intentions concerning the classification of land contamination after project completion.

3.2.4 Scenic amenity and lighting

Description of environmental values

Describe, in general terms, the existing character of the landscape and the general impression that would be obtained while travelling through and around it. Outline existing landscape features, panoramas and views that have, or could be expected to have, value to the community. Include information such as maps and photographs, particularly where addressing the following issues:

- major views, view sheds, outlooks, and features contributing to the amenity of the area, including assessment from private residences
- focal points, landmarks, waterways and other features contributing to the visual quality of the area and the project site(s)
- character of the local and surrounding areas including vegetation and land use.

At a level of detail appropriate to the scale of the project, describe the relevant geomorphology, supported by illustrative mapping highlighting any significant features and associated environmental values.

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[31] Department of Environment, *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Department of Environment, Brisbane*, 1998, viewed 3 June 2010, www.derm.qld.gov.au/register/p00090aa.pdf

[32] National Environment Protection Council , 1999, viewed 3 June 2011. Available from www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/all/search/0C97C416F6921CA5CA2571ED00292811

Potential impacts and mitigation measures

Describe the potential beneficial and adverse impacts of the project on landscape character and visual qualities of the site and the surrounding area. Explain what measures will be undertaken to mitigate or avoid the identified adverse impacts. Address the local and broader visual impacts of the project buildings and other structures. This should include views from:

- places of residence, work, and recreation
- road, cycle and walkways
- the air
- other known vantage points day and night

during all stages of the project as it relates to the surrounding landscape.

Use sketches, diagrams, computer imaging/simulation and photos where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations.

Detail the measures to be undertaken to mitigate or avoid identified adverse impacts.

Lighting

Provide an assessment of all potential impacts of the project's lighting, during all stages, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid, such as:

- 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.

3.3 Nature conservation

Detail the existing nature conservation values that may be affected by the proposal. Describe the environmental values 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.

Survey effort should be sufficient to identify, or adequately extrapolate, the floral and faunal values over the range of seasons, particularly during and following a wet season. The survey should account for the ephemeral nature of watercourses traversing the proposal area, and seasonal variation in fauna populations.

Also, outline the proposed strategies to avoid, or minimise and mitigate, impacts on the identified values by the project.

Identify key flora and fauna indicators for ongoing monitoring.

3.3.1 Sensitive environmental areas

Description of environmental values

Identify areas that are environmentally sensitive in proximity to the project on a map of suitable scale. This should include areas classified as having national, state, regional or local biodiversity significance, or flagged as important for their integrated biodiversity values. Refer to both Queensland and Commonwealth legislation and policies on threatened species and ecological communities.

Areas regarded as sensitive with respect to flora and fauna have one or more of the following features and should be identified and mapped:

- important habitats of species listed under the *Nature Conservation Act 1992* (Qld) (NC Act) 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
- good representative examples of remnant regional ecosystems or regional ecosystems that are described as having 'medium' or 'low' representation in the protected area estate as defined in the Regional Ecosystem Description Database (REDD) available at www.derm.qld.gov.au
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and other countries
- sites containing common species that represent a distributional limit and are of scientific value or that contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance

- sites of 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)
  - degraded vegetation or other habitats that still support high levels of biodiversity or act as an important corridor for maintaining high levels of biodiversity in the area
- a site containing other special ecological values (e.g. high habitat diversity and areas of high endemism)
- ecosystems that provide important ecological functions such as:
  - wetlands of national, state and regional significance
  - riparian vegetation
  - important buffer to a protected area
  - important habitat corridor between areas
- sites of palaeontologic significance such as fossil sites
- sites of geomorphological significance
- protected areas that have been proclaimed under the NC Act or are under consideration for proclamation
- areas of major interest, or critical habitat declared under the NC Act or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999* (Qld) (VM Act)
- areas which are important, or potentially important, as migratory corridors for population connectivity.

Areas of special sensitivity include wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species, and habitat of threatened plants, animals and communities.

Potential impacts and mitigation measures

Discuss the impact of the project on species, communities and habitats of local, regional or national significance in sensitive environmental areas as identified above. Include human impacts and the control of any domestic animals introduced to the area.

Demonstrate how the project would comply with the following hierarchy:

- avoiding impact on areas of remnant vegetation and other areas of conservation value including listed species and their habitat

- mitigating impacts through rehabilitation and restoration including, where relevant, a discussion of any relevant previous experience or trials of the proposed rehabilitation
- measures to be taken to replace or offset the loss of conservation values where avoiding and mitigating impacts cannot be achieved.

Explain why the measures above would not apply in areas where loss would occur.

Discuss the boundaries of the areas impacted by the project within or adjacent to an endangered ecological community, including details of footprint width. If the project area will impact upon a threatened community, include reasons for the preferred alignment and the viability of alternatives.

Address any actions of the project or likely impacts that require an authority under the NC Act, and/or would be assessable development for the purposes of the VM Act.

Outline how these measures will be implemented in the overall EMP for the project.

Where relevant, discuss environmental offset requirements in accordance with the *Queensland Government Environmental Offsets Policy*[33] and take into account the applicable specific-issue offset policies, as follows:

- *Policy for Vegetation Management Offsets*[34]
- *Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss.*[35]

Describe any departure from no net loss of ecological values.

3.3.2 Terrestrial flora

Description of environmental values

Provide vegetation mapping for all relevant project sites. Adjacent areas should also be mapped to illustrate interconnectivity. Mapping should also illustrate any larger scale interconnections between areas of remnant or regrowth vegetation where the project site includes a corridor connecting those other areas.

[33] Environmental Protection Agency, *Queensland Government Environmental Offsets Policy 2008*, Department of Environment and Resource Management, viewed 2 June 2011, www.derm.qld.gov.au/register/p02501aa.pdf
[34] Department of Environment and Resource Management, *Policy for Vegetation Management Offsets*, version 2.4, Department of Environment and Resource Management, Brisbane, 2009, viewed 3 June 2011, http://www.derm.qld.gov.au/about/policy/documents/3450/veg_2006_2888.pdf
[35] Department of Primary Industries, *Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss,* Department of Primary Industries, Brisbane, 2002, viewed 3 June 2011, http://www.dpi.qld.gov.au/documents/Fisheries_Habitats/FHMOP005-Fish-Hab-Manage.pdf

Describe and assess the potential impacts of any actions of the project or likely impacts that require an authority under the NC Act, and/or would be assessable development for the purposes of the VM Act. The assessment and supporting information should be sufficient for the administering authority to decide whether an approval can be granted and to develop recommended conditions on any approval granted.

Survey and describe terrestrial vegetation within the affected areas at an appropriate scale (maximum 1:10 000), in accordance with the Queensland Herbarium's Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, showing the following:

- location and extent of vegetation types using the regional ecosystem type descriptions in accordance with the REDD
- location of vegetation types of conservation significance based on regional ecosystem types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 1994 (Qld) and subsequent amendments, as well as areas subject to the VM Act. Identify remnant vegetation, namely areas mapped as being within remnant *least concern, of concern* and *endangered* regional ecosystems (REs) on the certified RE map that occurs within the project footprint. Also provide details of ground-truthing of mapped remnant vegetation to determine the actual area and extent of clearing of REs
- 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 and conservation reserves under the *Land Act 1994* (Qld))
- any plant communities of cultural, commercial or recreational significance
- the location of any horticultural crops in the vicinity of the project area
- location and abundance of any exotic or weed species.

Highlight sensitive or important vegetation types, including any riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. Specifically assess any potential impacts on a category A or B environmentally sensitive area and propose measures to avoid impacts.

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.

For each significant natural vegetation community likely to be impacted by the project, vegetation surveys should be undertaken at an appropriate number of sites, allowing for seasonal factors, and satisfying the following:

- the relevant regional vegetation management codes

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database
- the minimum site size should be 10 × 50 metres
- a complete list of species present at each site should be recorded
- the surveys to include species structure, assemblage, diversity and abundance
- the relative abundance of plant species present to be recorded
- any plant species of conservation, cultural, commercial or recreational significance to be identified
- 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
- identify remnant vegetation outside of the mining lease that is impacted by the project and is assessable development under the VM Act 1999 and provide details of how any proposed clearing will meet the relevant regional vegetation management code.

Vegetation mapping and data should be submitted to the Queensland Herbarium to assist with updating the CORVEG database.

Existing information on plant species may be used instead of new survey work, provided that the data is derived from previous surveys at the site consistent with the above methodology.

Show the occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Pest and Stock Route Management) Act 2002* on a map at an appropriate scale.

The methodology used for flora surveys should be specified in the appendixes to the report.

Potential impacts and mitigation measures

Describe 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 removing vegetation. Discuss the indirect effects on remaining vegetation. Consider short-term and long-term effects and comment on whether the impacts are reversible or irreversible.

With regard to all components of the project, include:

- any management actions to minimise vegetation disturbance and clearance
- a discussion of the ability of identified vegetation to withstand any increased pressure resulting from the project and any measures proposed to mitigate potential impacts

- a description of the methods to ensure rapid rehabilitation of disturbed areas following construction, including the species chosen for revegetation, which should be consistent with the surrounding associations
- details of any post construction monitoring programs
- a discussion of the potential environmental harm on flora due to any alterations to the local surface and groundwater environment with specific reference to impacts on riparian vegetation or other sensitive vegetation communities.

Outline how these measures will be implemented in the overall EMP for the project.

Describe any construction and operation components of the project involving clearing or translocation of vegetation. Discuss indirect impacts on vegetation not cleared (such as edge effects of infrastructure in close proximity to riparian vegetation and fauna movement corridors, impacts of linear infrastructure and fragmentation).

Assess impacts during construction and operation of the project. Identify the number of hectares of remnant vegetation proposed to be cleared (by conservation status and regional ecosystem type). Discuss these figures in terms of the long-term sustainability of these ecosystems to remain in the landscape at a regional level. Short-term and long-term durations should be considered.

The description needs to include the potential for:

- impacts on protected areas (e.g. nature reserves, national parks, conservation parks, resource reserves, nature refuges)
- identifying the amount of vegetation to be removed from these protected areas and impacts on other environmental values of these protected areas.

Describe the measures proposed to mitigate the impacts of the project on vegetation, with particular reference to vegetation types identified as having high conservation values, listed species and sensitive habitat or the inhibition of propagation.

Proposed environmental offsets should be consistent with the requirements set out in any applicable specific-issue offset policies under the framework of the Queensland Government's *Environmental Offset Policy (2008)* [36] and the *Environmental Protection and Other Acts Amendment Act 2011*.

Indicate whether vegetation offsets will be required for clearing of endangered or of concern vegetation outside of the mining lease. Provide details of how the offsets meet the requirements of the relevant code under the VM Act. If offsets are required,

[36] Environmental Protection Agency, Queensland Government, *Environmental Offset Policy,* June 2008, viewed 2 June 2011, http://www.derm.qld.gov.au/register/p02501aa.pdf

provide details about how the offset will meet the *Policy for Vegetation Management Offsets, Version 2.4 (2009)*[37].

With regard to the project area, this section should include:

- the significance of impacts at local, catchment, bioregional, state or national levels
- impact on any plants of potential or recognised environmental or economic significance
- a discussion of the ability of identified stands of vegetation to withstand any increased pressure resulting from the project and measures proposed to mitigate impacts
- a description of the methods to ensure progressive rehabilitation of disturbed areas following construction, including the species chosen for revegetation which should be consistent with the surrounding associations
- a description of the potential for introducing and/or spreading weeds or plant disease, including:
  - identifying the origin of construction materials, machinery and equipment
  - staff/operator education programs
  - determining the potential for introducing or facilitating exotic, non-indigenous and noxious plants
  - a weed management plan to address the management of weeds and other exotic species related to the project site.

Weed management strategies are required for containing existing weed species (e.g. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with provisions of the *Land Protection (Pest and Stock Route Management) Act 2002* in the main body of the EIS and in the pest management plan within the EMP for the project.

3.3.3 Terrestrial fauna

Description of environmental values

Describe the terrestrial and riparian fauna present, or likely to be present, in the areas affected by the proposal, noting the broad distribution patterns in relation to vegetation, topography and substrate. Include:

- species diversity (i.e. a species list) and abundance of animals of recognised significance

[37] Department of Environment and Resource Management, *Policy for Vegetation Management Offsets, Version 2.4 October 2009*, viewed 2 June 2011, http://www.derm.qld.gov.au/about/policy/documents/3450/veg_2006_2888.pdf

- any species that are poorly known but suspected of being rare or threatened
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- the existence of feral or introduced animals including those of economic or conservation significance
- existence (actual or likely) of any species/communities of conservation significance 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 or threatened species recovery plans)
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- an estimate of commonness or rarity for the listed or otherwise significant species
- use of the area by migratory fauna
- use of breeding places.

Identify any species listed by the EPBC Act and the NC Act occurring in the project area. Identify any species listed by the Department of Environment and Resource Management's (DERM) 'Back on Track'[38] species prioritisation methodology.

The proponent must submit methodology used for fauna surveys to DERM for consultation prior to commencing surveys. Fauna survey methodology should be specified in the appendices to the report. The EIS should also indicate how well any affected significant communities and species are represented and protected elsewhere in the region where the project is proposed. Relevant site data should be provided in a compatible format to DERM in a format compatible with the Wildlife Online [39] database for listed threatened species.

Potential impacts and mitigation measures

The assessment of potential impact should consider impacts the project may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:

- impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors or as a result of hydrological change
- identify areas where the activities of the project may disturb animal breeding places and/or disrupt the breeding of species
- impacts on native species, particularly species of conservation significance

[38] For information on Department of Environment and Resource Management's Back on Track methodology, refer to www.derm.qld.gov.au/wildlife-ecosystems/wildlife/back_on_track_species_prioritisation_framework/index.html
[39] Formerly the WildNet database. Refer to www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online/index.html viewed 3 June 2011.

- fragmentation of identified wildlife habitat areas
- cumulative effects of direct and indirect impacts
- threatening processes leading to progressive loss.

Address any actions of the project or likely impacts that require an authority under the NC Act. Provide the following information on mitigation strategies:

- measures to avoid and mitigate the identified impacts. Any provision for buffer zones and movement corridors, nature reserves or special provisions for migratory animals should be discussed and coordinated with the outputs of the flora assessment
- details of the methodologies that would be used to avoid injuries to livestock and native fauna as a result of the project's construction and operational works, and if accidental injuries should occur, the methodologies to assess and handle injuries
- strategies for complying with the objectives and management practices of relevant recovery plans.

Refer to state or Commonwealth recovery plans for potentially affected threatened species and describe strategies for complying with the objectives and management practices of relevant recovery plans.

Outline how these measures will be implemented in the overall EMP for the project. Rehabilitation of disturbed areas should incorporate, where appropriate, provision of nest hollows and ground litter.

Address feral animal management strategies and practices. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with the provisions of the *Land Protection (Pest and Stock Route Management) Act 2002* in the main body of the EIS and in the pest management plan within the EMP for the project.

3.3.4 Aquatic biology

Description of environmental values

The aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways and any associated wetlands. The description of the flora and fauna present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area and any associated wetlands
- any rare or threatened marine species

- a description of the habitat requirements and the sensitivity of aquatic species to changes in flow regime, water levels and water quality in the project areas
- aquatic plants including native and exotic/weed species
- aquatic and benthic substrate
- habitat downstream of the project or potentially impacted due to currents in associated lacustrine (living in or growing in lakes) and marine environments
- a description to Order or Family taxonomic rank of the presence and nature of stygofauna (fauna living in groundwater systems) occurring in groundwater likely to be affected by the project. Sampling and survey methods should be in accordance with the best practice guideline currently published by the Western Australian Environmental Protection Authority–*Guidance for the assessment of environmental factors No.54 (December 2003)*[40] and *Guidance for the assessment of environmental factors No.54a (August 2007) Technical Appendix to Guidance Statement 54*[41]
- aquatic substrate and stream type, including extent of tidal influence and common levels such as highest astronomical tide and mean high water springs.

Potential impacts and mitigation measures

Discuss the potential impacts of the project on the aquatic ecosystems and describe proposed mitigation actions, including:

- details of proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that would restrict free movement of aquatic fauna
- measures to avoid fish spawning periods, such as seasonal construction of waterway crossings and measures to facilitate fish movements through water crossings
- details of alternatives to waterway crossings where possible
- offsets proposed for unavoidable, permanent loss of fisheries habitat
- a description of methods to minimise the potential for the introduction and/or spread of weed species or plant disease
- in any groundwater aquifers found to contain stygofauna, a description of the potential impacts on stygofauna of any changes in the quality and quantity of the groundwater, and details of any mitigation measures that may be applied
- details of monitoring of aquatic biology health, productivity and biodiversity in areas subject to direct discharge.

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[40] Environmental Protection Authority, Western Australia, *Guidance for the assessment of environmental factors No.54, Consideration of subterranean fauna in groundwater and caves during Environmental Impact Assessment in Western Australia, December 2003,* viewed on 2 June 2011, http://www.epa.wa.gov.au/docs/1720_gs54.pdf

[41] Environmental Protection Authority, Western Australia, *Guidance for the assessment of environmental factors No.54a, Sampling methods and survey considerations for subterranean fauna in Western Australia* , August 2007, viewed 2 June 2011, http://www.epa.wa.gov.au/EPADocLib/2543_GS54a30708.pdf

Address any actions of the project or likely impacts that require an authority under the relevant legislation including the NC Act and/or the *Fisheries Act 1994.* Outline how these measures will be implemented in the overall EMP for the project.

3.4 Water resources

3.4.1 Description of environmental values

Describe the existing water resources that may be affected by the project in the context of environmental values, as defined in such documents as the EP Act, *Environmental Protection (Water) Policy 2009* (EPP (Water)), *Australia and New Zealand Guidelines for Fresh and Marine Water Quality*[42] and the *Queensland Water Quality Guidelines 2009.*[43]

Provide an indication of the quality and quantity of water resources in the vicinity of the project area that may be affected by the project describing:

- existing surface and groundwater in terms of physical, chemical and biological characteristics. Parameters should include a broad range of water quality indicators including, but not necessarily limited to:
  - electrical conductivity
  - major cations and anions
  - dissolved metals
  - minor ions (such as ammonia, nitrite, nitrate, fluoride)
  - hydrocarbons
  - any other potential toxic or harmful substances
  - turbidity
  - suspended sediments
  - pH.
- existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses.

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

- values identified in the EPP (Water)

[42] Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, 2000, viewed 3 June 2011, www.mincos.gov.au/publications/australian_and_new_zealand_guidelines_for_fresh_and_marine_water_quality

[43] Department of Environment and Resource Management, *Queensland Water Quality Guidelines 2009*, Department of Environment and Resource Management, Brisbane, 2009, viewed 3 June 2011, www.derm.qld.gov.au/environmental_management/water/queensland_water_quality_guidelines/queensland_water_quality_guidelines_2009.html

- the physical, chemical and biological characteristics of existing surface water
- existing surface drainage patterns, flows, history of flooding including extent, levels and frequency, and present water uses
- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- any impoundments (e.g. dams, levees, weirs etc.)
- hydrology of waterways and groundwater
- sustainability, including both quality and quantity
- dependent ecosystems
- existing and other potential surface and groundwater users
- water resource plans relevant to the affected catchments.

All sampling should be performed in accordance with the *Monitoring and Sampling Manual 2009*[44] or the most current edition. The description of water quality should include medians, ranges and percentiles appropriate for comparison with appropriate trigger levels and guidelines for the protection of aquatic ecosystems and downstream users.

Investigate the relationship between groundwater and surface water to assess the nature of any interaction between the two resources and any implications of the proposed mine that would affect the interaction.

Groundwater

If the project is likely to use or affect local sources of groundwater, describe groundwater resources in the area in terms of:

- geology/stratigraphy
- aquifer type—such as confined, unconfined
- depth to and thickness of the aquifers
- depth to water level and seasonal changes in levels
- groundwater flow directions (defined from water level contours)
- interaction with surface water
- possible sources of recharge
- potential exposure to pollution

[44] Department of Environment and Resource Management, *Monitoring and Sampling Manual 2009*, version 2, Department of Environment and Resource Management, Brisbane, 2009, viewed 3 June 2011, www.derm.qld.gov.au/environmental_management/water/pdf/monitoring-man-2009-v2.pdf

- current access to groundwater resources in the form of bores, springs and ponds (including quantitative yield of water and locations of access).

Review the quality, quantity and significance of groundwater in the project area, together with groundwater use in neighbouring areas. Refer to relevant legislation or water resource plans for the region. The review should also provide an assessment of the potential take of water from the aquifer and how current users, the aquifer itself and any connected aquifers will be affected by the take of water.

Include a survey of existing groundwater supply facilities (bores, wells, or excavations) to the extent of any environmental harm. Gather the following information for analysis:

- location, type and status of existing groundwater entitlements and associated infrastructure (bores, wells or excavations)
- pumping parameters
- draw down and recharge at normal pumping rates
- seasonal variations (if records exist) of groundwater levels.

Develop a network of observation points that would satisfactorily monitor groundwater resources both before and after commencement of operations.

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.

3.4.2 Potential impacts and mitigation measures

Assess the potential impacts of the project on water resource environmental values identified in the previous section. Also, define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of objectives will be monitored, audited and managed. Include the following:

- potential impacts on the flow and the quality of surface water and groundwater from all phases of the project, with reference to their suitability for the current and potential downstream uses and discharge licences
- any implications of the *Water Resource (Burdekin Basin Plan) 2007* that apply to the project
- an assessment of all likely impacts on groundwater depletion or recharge regimes
- the likely volume of groundwater to be dewatered during the operations and its likely quality characteristics, including salinity
- the impacts on groundwater resources in each aquifer of any take of groundwater or dewatering as a result of the mine's operation

- how extracted groundwater will be managed in the surface water management system to minimise the likelihood of discharging highly saline water
- measures to prevent, mitigate and remediate any impacts on existing users or groundwater-dependent ecosystems
- the potential environmental impact caused by the project (and its associated project components) to local groundwater resources, including the potential for groundwater-induced salinity
- the response of the groundwater resource to the progression and finally cessation of the proposal
- the project's impact on the local groundwater regime caused by the altered porosity and permeability of any land disturbance
- any potential for the project to impact on groundwater-dependent vegetation, including avoidance and mitigation measures
- potential impacts of surface water flow on existing infrastructure, with reference to the EPP (Water) and the *Water Act 2000*
- chemical and physical properties of any wastewater (including stormwater at the point of discharge into natural surface waters), and the toxicity of effluent to flora and fauna
- how contaminants and wastes are avoided, minimised, treated and managed in accordance with section 13 of EPP (Water)
- environmental monitoring to check the effectiveness of mitigation measures
- potential impacts on other downstream receiving environments, if it is proposed to discharge water to a riverine system
- if it is proposed to discharge water to a riverine system, mitigation measures for water treatment
- the results of a risk assessment for controlled releases and uncontrolled releases to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts
- address any potential migration issues and risks associated with the inter-basin transfer of water
- an assessment of the potential to contaminate surface and groundwater resources and measures to prevent, mitigate and remediate such contamination.

Describe and address the impacts of subsidence, including but not limited to:

- surface water resources
- local drainage patterns
- floodplains and overland flows

- areas susceptible to higher levels of erosion, such as watercourses confluences
- ponding areas within the floodplain
- volumes of local and large-scale catchment runoff, including the interception of low flow events
- infrastructure within and above the watercourse
- downstream users.

Assess any potential surface water and groundwater interaction as a result of subsidence of a watercourse. Also assess the potential impacts on the groundwater regime in alluvial and deeper aquifers due to altered porosity, permeability and interconnectivity from any land disturbance, including subsidence.

Assess the potential impacts of subsidence on the sediment load within watercourses.

Strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives.

Describe the monitoring programs that will assess the effectiveness of management strategies for protecting water resources during the construction, operation and decommissioning of the project. Outline how these strategies are incorporated into appropriate sections of the EMP.

Surface water and water courses

Assess the hydrological impacts of the proposal on surface water and water courses, particularly with regard to stream diversions, scouring and erosion, and changes to flooding levels and frequencies both upstream and downstream of the project. If flooding levels will be affected, modelling of afflux should be provided and illustrated with maps.

Analyse the potential impacts of the diversion of affected waterways on existing and proposed relocated roads. This analysis should identify any likely inundation and duration, as this may affect emergency vehicle access.

Describe monitoring programs that 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 waterway crossings.

If on-site storage of water sourced from wastewater treatment plants is proposed, detail how this water would be managed to avoid environmental harm. Describe the design features of any such storages to effectively contain saline water and other harmful constituents.

Key water management strategy objectives include:

- maintaining sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintaining in-stream biota)
- maintaining or replicating the existing geomorphic condition of local watercourses
- minimising impacts on flooding levels and frequencies both upstream and downstream of the project.

Include a risk assessment for controlled and 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.

Discuss potential impacts to the flow and the quality of surface waters from all phases of project activities, including waterway diversions or crossings and land reclamation. Give particular consideration to implications for current and potential downstream uses and sensitive receptors, including the requirements of any affected riparian area and in-stream biological uses in accordance with the EPP (Water) and the *Water Act 2000*.

Include details of any proposed waterway barrier works with justification detailing the need for the barrier and any alternatives considered. The impacts of surface water flow on any existing water infrastructure should also be considered.

Describe the proposed stockpile stormwater drainage system and the proposed disposal arrangements, including any off-site services and downstream impacts. Discuss options for storing and/or disposing of surplus groundwater (if applicable), including the beneficial and adverse impacts of each option. Identify the licensing requirements for each option.

Where settlement ponds are proposed, 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.

Carry out a dam failure impact assessment for any proposed settlement ponds or 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 referrable under the *Water Act 2000* should be noted and emergency response procedures incorporated into the project's EMP.

Discuss the need or otherwise for licensing of any dams (including referable dams) or creek diversions, under the *Water Act 2000*. Water allocation and water sources, including impacts on existing water entitlements, including water harvesting, should be established in consultation with DERM.

Identify any impacts on downstream users, including stock and domestic users due to changes in flow regimes. Outline mitigation strategies required for impacts on downstream users.

Include sufficient information on the watercourse diversion to demonstrate that any proposed diversions can be constructed to meet engineering requirements and relevant regulatory guidelines. Such information will consider the following:

- requirement for diversion
- feasibility of the diversion to be designed, constructed and monitored in accordance with Australia's Coal Industry Research Program (ACARP) reports and DERM guidelines relating to watercourse diversions
- end-of-mine-life strategies for the diversion.

Relevant documents for watercourse diversions should be detailed in this section as follows:

  - ACARP reports[45] relative to stream diversions within the Bowen Basin:
  - *Project C8030 (Stage 1) – Maintenance of Geomorphic Processes in Bowen Basin River*
  - *Diversion Project C9068 (Stage 2) – Monitoring Geomorphic Processes in Bowen Basin River Diversions*
  - *Project C9068 (Stage 3) – Design and Rehabilitation Criteria for Bowen Basin River Diversions*.
- DERM regional guideline *Watercourse Diversions – Central Queensland Mining Industry* (14 January 2008).

This section should detail the use of the abovementioned reports when proposing, designing, constructing and monitoring watercourse diversions.

Consider 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 protection of water (flood harvesting) entitlements should also be addressed. Discuss potential impacts to the natural environment from stream diversions.

Assess and discuss risks to downstream habitats from potentially contaminated surface water flow, particularly during flood events.

Discuss options for flood mitigation and the effectiveness of mitigation measures, with particular reference to sediment, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

[45] Available from http://www.acarp.com.au/reports.aspx viewed 20 June 2011

Wastewater treatment

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

In relation to water supply and usage, and wastewater disposal, discuss anticipated flows of water to and from the proposal area. Where dams, weirs or ponds are proposed, investigate the effects of predictable climatic extremes (storm events, floods and droughts) on:

- the capacity of the water storages (dams, weirs, ponds) and the ability of these storages to retain contaminants
- the structural integrity of the containing walls
- relevant operating regime
- the quality of water contained
- flows and quality of water discharged.

The design of all water storage facilities should follow the technical guidelines for on-site water management.

Discuss the mitigation options and the effectiveness of mitigation measures, with particular reference to sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

Groundwater

Include an assessment of the potential environmental impact caused by all key components of the project to local groundwater resources, including the potential for groundwater-induced salinity.

Describe the response of the groundwater resource to the progression and finally cessation of the proposal.

Assess and describe any potential for the project to impact on groundwater-dependent vegetation; describe avoidance and mitigation measures.

Assess and describe the potential environmental harm the project may cause to local groundwater resources. Matters to be addressed should include:

- potential impacts on the flow and the quality of groundwater from all phases of the project, with reference to their suitability for the current and potential downstream uses
- impact on the local groundwater regime caused by the altered porosity and permeability of any land disturbance
- an assessment of all likely impacts on groundwater depletion or recharge regimes

- potential impacts on other downstream receiving environments, if it is proposed to discharge water to a riverine system
- an assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination.

The EIS must address where there will be requirements for a Riverine Protection Permit.

3.5 Forestry products and quarry materials

If any timber resources or quarry material are to be taken, disturbed or used for purposes other than mining within the boundaries of the mining lease, or outside of the MLA as part of the project, provide information on the following:

- the footprint of the areas to be disturbed by the project, associated infrastructure and any rail alignment(s)
- an assessment of Lot 3 on SP171922 where commercial native forest log and fencing type timber will be affected and where salvage harvesting may be required
- an assessment of the areas of state-owned land where commercial native forest log and fencing type timber will be affected and where salvage harvesting may be required
- the identification of the sources of quarry materials both on and off the alignment for each component of the project
- details of any use of quarry material either outside the mining lease area or not consistent with the mining operation
- existing approval arrangements where forestry and quarry materials are in the project area.

3.6 Air quality

3.6.1 Description of environmental values

Describe the existing air quality that may be affected by the project in the context of environmental values as defined by the EP Act and *Environmental Protection (Air) Policy 2008* (EPP (Air)).

Discuss the existing air shed environment, both local and regional, including:

- background levels and sources of particulates, gaseous and odorous compounds and any major constituent
- pollutants, including greenhouse gases, that may be generated by the project
- baseline monitoring results, sensitive receptors

- data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms.

Parameters should include air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input to the models.

3.6.2 Potential impacts and mitigation measures

Consider the following air quality issues and their mitigation.

- Accurately describe the activities carried out on the site; include a process flow diagram clearly showing all unit operations to be carried out on the premises; and provide a detailed discussion of all unit operations.
- Describe all pollution control equipment and pollution control techniques employed on the premises and the features of the proposal designed to suppress or minimise emissions, including dusts.
- Describe the back-up measures that will act in the event of primary measures failing, to minimise the likelihood of upsets and adverse air impacts.
- Provide an air emission inventory of the project area for all potential points, area and volume sources including fugitive emissions of dusts; provide a complete list of emissions to the atmosphere including SOx, NOx, CO_2, particulates, PM_{10} and $PM_{2.5.}$ The inventory is to include air emissions expected during the construction and operational activities of the project.
- Identify all expected emissions of the hazardous air pollutants and their emissions from known and fugitive sources.
- Estimate emission rates, based on actual measurements of samples taken from similar facilities—either full-scale facilities operating elsewhere, or experimental or demonstration-scale facilities. Where this is not possible, use published emission factors and/or data supplied by manufacturers of process and control equipment.
- Provide an impact assessment with relevant inputs of emissions and local meteorology to an air dispersion model to estimate the likely impacts on the surrounding environment. The model inputs should be as detailed as possible, reflecting any variation of emissions with time and including at least a full year of representative hourly meteorological data. Estimate maximum ground level concentration and monthly average dust deposition values at the nearest sensitive receptor(s), including on-site offices and worker accommodation camps.

  Present the results of the dispersion modelling as concentration contour plots and concentrations at the discrete sensitive receptors. The predicted ground level concentration should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary.

- Describe the background ambient air concentration from the existing sources in the air shed and evaluate the cumulative impact on the receiving environment. Address both acute and cumulative impacts by considering the project in conjunction with existing and known future emission sources within the region.
- Provide an averaging period for ground level concentrations of pollutants that are modelled. This should be consistent with the relevant averaging periods for air quality indicators and goals in the EPP (Air) and the National Environment Protection (Ambient Air Quality) Measure 1998.[46] For example, the modelling of PM_{10} must be conducted for one-hour, 24 hours and annual averaging periods.
- Identify the worst case meteorological conditions based on the modelled ground level predictions and, using this information, develop dust mitigation measures for the mining activities. Describe the dust management plan that will be employed to mitigate adverse air impacts under the worst meteorological conditions.
- Discuss the limitations and accuracy of the applied atmospheric dispersion models. The air quality modelling results should be discussed in light of the limitations and accuracy of the applied models.

  Where there is no single atmospheric dispersion model that can handle the different atmospheric dispersion characteristics exhibited in the project area (e.g. sea breezes, strong convection, terrain features, temperature inversions and pollutant re-circulation), a combination of acceptable models will need to be applied.
- 'Worst-case' emissions that may occur during operation. If these emissions are significantly higher than those for normal operations, it will be necessary to separately evaluate the worst-case impact to determine whether the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate.
- Ground-level predictions should be made at any site that includes the environmental values identified by the EPP (Air), including any sites that could be sensitive to the effects of predicted emissions.
- Dust generation from construction activities especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers.
- Climatic patterns that could affect dust generation and movement.
- Vehicle emissions and dust generation along major haulage routes both internal and external to the project site.
- Assess human health risk associated with emissions from the facility of all hazardous or toxic pollutants.
- Impacts on terrestrial flora and fauna.

[46] Available from www.legislation.gov.au

For the operational rail component, consider the following air quality issues:

- impacts of dust generation from construction activities, especially in areas where the corridor follows existing road networks or passes in close proximity to residences (e.g. Collinsville)
- predicted changes to existing air quality from vehicle emissions and dust generation along haulage routes and storage locations of construction materials, including ballast
- potential for impacts on air quality from operating diesel powered locomotives in rail operations
- the potential for coal dust emissions to provide an environmental nuisance to any sensitive receptor along the proposed rail corridor.

Detail the mitigation measures together with proactive and predictive operational and maintenance strategies that could be used to prevent and mitigate impacts. To ensure that all relevant coal rail-transport related dust mitigation measures are implemented to support the project, the proponent should consult with the Project Manager, Coal Loss Management Project, QRNational's QR Network Division to determine the requirements for new coal-loading facilities, load controls and spray-on coal dust suppressant systems as a result of the implementation of the coal dust management plan (CDMP).

Discuss potential air quality impacts from emissions, with reference to the National Environmental Protection (Ambient Air Quality) Measure 2003[47] and the EPP (Air). If an emission is not addressed in these legislative instruments, the emission should be discussed with reference to its risk to human health, including appropriate health-based guidelines/standards.

3.7 Greenhouse gas emissions

3.7.1 Description of environmental values

Provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO_2 equivalent' terms for the following categories:

- Scope 1 emissions—means direct emissions of greenhouse gases from sources within the boundary of the facility and as a result of the facility's activities
- Scope 2 emissions—means emissions of greenhouse gases from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility.

[47] Available from: www.ephc.gov.au/sites/default/files/AAQ_NEPM__Ambient_Air_Quality_NEPM_Varied_scaleplus_Final_200305_1.pdf

Briefly describe method(s) by which estimates were made.

The Commonwealth Department of Climate Change *National Greenhouse Accounts (NGA) Factors*[48] can be used as a reference source for emission estimates and supplemented by other sources where practicable and appropriate. As a requirement of the NGA factors, estimates should include the loss of carbon sink capacity of vegetation due to clearing and impoundment.

3.7.2 Potential impacts and mitigation measures

Discuss the potential for greenhouse gas abatement measures, including:

- the proposed measures (alternatives and preferred) to avoid and/or minimise direct greenhouse gas emissions
- how the preferred measures minimise emissions and achieve energy efficiency
- 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 environment management
- any opportunities to further offset greenhouse gas emissions through indirect means including sequestration and carbon trading
- the feasibility of utilising natural gas , either compressed natural gas (CNG) or liquefied natural gas (LNG) as a fuel alternative to diesel for mining equipment and on site coal transport.

Include a specific module in the EMP to address greenhouse abatement including:

- 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
- opportunities for offsetting greenhouse emissions, including, if appropriate, carbon sequestration and renewable energy uses

[48] Department of Climate Change and Energy Efficiency, *National Greenhouse Accounts (NGA) Factors*, Department of Climate Change and Energy Efficiency, Canberra, 2010, viewed 2 June 2011, www.climatechange.gov.au/~/media/publications/greenhouse-acctg/national-greenhouse-factors-july-2010-pdf.pdf

- commitments to monitor, audit and report on greenhouse emissions from all relevant activities and the success of offset measures.

3.7.3 Potential benefits

Discuss the potential benefits of the project in terms of its overall greenhouse gas footprint.

3.8 Noise and vibration

3.8.1 Description of environmental values

Describe the existing noise and vibration environment that may be affected by the project in the context of the environmental values defined by the *Environmental Protection (Noise) Policy 2008.* DERM's *Noise Measurement Manual*[49] should be considered and references made to the *Guideline: Noise and Vibration from Blasting*.[50]

Identify sensitive noise receptors within or adjacent to all project component areas and identify on a map(s) at an appropriate scale. Estimate typical background noise and vibration levels based on surveys at representative sites and include in the EIS. Discuss the potential sensitivity of such receptors and nominate performance indicators and standards for each affected receptor. Approximate locations for construction and operational phase worker accommodation camps and site offices are to be included as sensitive receptors.

3.8.2 Potential impacts and mitigation measures

Describe the impacts of noise and vibration generated during the construction, operational and decommissioning phases of the project and include:

- the levels of noise and vibration generated, including noise contours, assessed against current typical background levels, using modelling where appropriate
- impact of noise, including low frequency noise (noise with components below 200 Hz) and vibration at all potentially sensitive receivers compared with the performance indicators and standards nominated above
- impact on terrestrial and aquatic fauna
- proposals to minimise or eliminate these effects, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise and vibration

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[49] Department of Environment and Resource Management, *Noise Measurement Manual*, 3rd edn, Department of Environment and Resource Management, Brisbane, 2000, viewed 20 December 2010 www.derm.qld.gov.au/register/p00367aa.pdf

[50] Environment Protection Agency, *Guideline: Noise and vibration from blasting*, Environment Protection Agency, Brisbane, 2006, viewed 2 June 2011, www.derm.qld.gov.au/register/p01382aa.pdf

- the impact on human health at the sensitive receivers and how impacts will be appropriately mitigated to achieve a satisfactory internal noise level for the preservation of health and well-being identified within the Environmental Protection (Noise) Policy 2008. Provide management options at the sensitive receivers when noise attenuation at the source does not adequately reduce the emissions.
- For the proposed construction and operation of railway infrastructure, assess the acoustic impacts of the rail with reference to the *QR Code of Practice for Railway Noise Management*.[51]

3.9 Waste

3.9.1 Waste generation

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

- the tonnage of raw materials processed
- the amount of resulting process wastes
- the volume and tonnage of any re-usable by-products.

Provide schematic diagrams of processes to be used at each distinct stage of the project, indicating each waste stream and its intended fate. This applies to all waste outputs—solid, liquid and gaseous—including fugitive emissions from coal seams, and recycling efforts such as stockpiling and reusing topsoil. The schematic diagrams, or an associated table, will cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described. Describe the physical and chemical characteristics and the variability of composition and generation rates of each waste material.

In each subsection on waste management, assess how the proposed methods for waste management at each stage of the project achieve the highest possible level on the waste management hierarchy with regard to the principles in the *Environmental Protection (Waste Management) Policy 2000*.

Describe how the project would achieve natural resource use efficiency (such as minimum use of energy and water, and minimum footprint on used land), integrated processing design, co-generation of power and by-product re-use as shown in a material/energy flow analysis. This information is required to enable the resource

[51] QR National, *QR Code of Practice for Railway Noise Management* , 2007, viewed 3 June 2011, http://www.qrnational.com.au/Corporate/OurCommitment/Environment/Documents/Noise_Code_Practice_2007.pdf

management agencies and other stakeholders to assess the efficiency of resource use, and allocation issues.

3.9.2 Waste management

Assess the potential impact of all wastes generated during construction, operation and decommissioning, with regard for best practice waste management strategies, the *Environmental Protection (Waste) Policy 2000* and the Environmental Protection (Waste) Regulation 2000. Provide details of each waste in terms of:

- the options available for avoidance/minimisation
- operational handling and fate of all wastes including storage
- on-site treatment methods proposed for any wastes
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes
- the potential level of impact on environmental values
- measures to ensure stability of the waste storage areas and impoundments
- methods to prevent seepage and contamination of groundwater from stockpiles and/or storage areas and impoundments
- measures to minimise attraction of vermin, insects and pests
- options available for using recycled materials
- market demand for recyclable waste (where appropriate)
- decommissioning of the construction site
- decommissioning of the mine site.

Provide details of waste management strategies (including reduction, re-use, recycling, storage, transport and disposal of waste). The discussion should demonstrate that waste minimisation and cleaner production techniques and designs will be implemented to prevent or minimise environmental impacts when selecting processes, equipment and facilities.

Provide information on the variability, composition and generation rates of all waste produced at the site and processing plant.

Provide details of cleaner production waste management planning, especially how these concepts will be applied to prevent or minimise environmental impacts at each stage of the proposal. Discuss measures to improve natural resource use efficiency (e.g. energy and water), integrated processing design, any co-generation of power and by-product re-use as shown in a material/energy flow analysis.

This information is required to enable the resource management agencies and other stakeholders to assess the efficiency of resource use and allocation issues.

The EIS should consider the following effects:

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

Air emissions

Provide information on air emissions, including particulates, fumes and odours, during the construction and operation stages of the project. Particulate emissions include those that would be produced by any industrial process, or disturbed by wind action on stockpiles and conveyors, or by transportation equipment (e.g. trucks, either by entrainment from the load or by passage on unsealed roads). The methods to be employed to mitigate impacts from air emissions should be described in Part B, subsection 3.6, Air quality.

Excavated waste

Describe and show the location, design and methods for constructing dumps for waste rock and subsoil. Show the location of the dumps on a map relative to topography and other natural features of the area. Include:

- an estimation of the tonnage and volume of waste rock and subsoil to be excavated during the various stages of operation
- a description of the chemical and physical properties of the waste rock and subsoil, and assessment of the properties that affect their erosion and leaching potential
  - undertake the characterisation of the waste in accordance with the Assessment and Management of Acid Drainage guideline of the *Technical Guidelines for the Environmental Management of Exploration and Mining in*

Queensland series,[52] *Managing Acid and Metalliferous Drainage*[53] and any other applicable best practice guidelines

  - the characterisation of waste rock and subsoil will include, but not necessarily be limited to:
    - sulfides
    - metals
    - pH
    - conductivity and chloride of slurry samples
    - the Net Acid Producing Potential and Net Acid Generation potential of the mined waste.
  - pay particular attention to materials such as waste rock immediately above or below coal seams, where potentially acid forming material may be concentrated. The sampling effort must be sufficient to provide a statistically valid characterisation of each of the various types of waste rock, taking account of the geological variability and complexity within and between rock types.

- a discussion of the potential for acid, neutral, alkaline or saline drainage from waste dumps
  - characterise the potential quality of leachate from the mined waste under field conditions, including contaminants such as sulfate, pH, chloride, iron, major cations and anions, and any chemical species in sufficient quantity that is likely to cause environmental harm including nuisance
  - cross-reference to sections elsewhere in the EIS that assess in detail the potential impacts of any direct or indirect discharge of leachate on downstream sensitive environments or users of receiving waters
- an analysis of the estimated amounts and characteristics of excavated waste to develop appropriate measures for dealing with that waste, including designs for waste dumps, and alternatives for excavated waste disposal such as in-filling of voids, off-site options and treatment of contaminated soil. Assess the likely performance of the proposed waste disposal options with particular regard to:
  - segregating and encapsulating sub-economic but mineralised rock and/or potentially acid-forming rock

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[52] Department of Minerals and Energy, *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland*, Department of Mines and Energy, 1995, viewed 2 June 2011, www.derm.qld.gov.au/environmental_management/land/mining/technical_guidelines.html

[53] Department of Industry, Tourism and Resources, *Managing acid and metalliferous drainage: Leading Practice Sustainable Development Program for the mining industry*, Department of Industry, Tourism and Resources, Canberra, 2007, viewed 2 June 2011, www.ret.gov.au/resources/Documents/LPSDP/LPSDP-AcidHandbook.pdf

  - managing surface drainage and sub-surface leachate, both during operations at the mine and after mining ceases (note: avoid placing dumps across drainage lines that would pond water behind the dump and cause infiltration)
  - slope profiles and the stability and erosion potential of waste dumps
  - the intended land use after mining ceases, and the land management and maintenance requirements for the subsequent landholder
- consideration of the physical, geo-mechanical and chemical properties of waste rock in both fresh and weathered forms when determining their suitability for constructing stable slopes and developing measures to avoid acid generation from waste rock dumps and backfilling operations
- illustration of the location and cross-sections of the proposed dumps on maps, drawings and diagrams relative to topography and other natural features of the area.

Tailings

Describe the methods and materials that would be used to produce tailings waste (tailings should be understood to include any fine reject material) including the following:

- Whether the methods to be used to produce and treat tailings would be novel or established. For novel methods, describe the testing undertaken to determine if the method would be suitable for the proposed use. For established methods, provide examples of where the method has been, or is being used and assess the equivalence of those examples to the proposed use.
- Estimate the annual production of tailings waste at the various stages of the project.
- Describe how the methods used to produce and treat tailings would be in accordance with the waste management hierarchy and the tailings management principles in the tailings management guideline of the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland* series.[54]
- Describe in detail the likely physical and chemical characteristics of the tailings waste and the likely chemical characteristics of wastewater from the pressing plant, the decant water from any tailings storage facility (TSF), and the pore water and leachate from any dump containing tailings.
- Describe and illustrate the proposed locations of any pits, dams, bunds or dumps that would be used for disposing of tailings.

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[54] Department of Minerals and Energy, *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland*, Department of Mines and Energy, 1995, viewed2 June 2011, www.derm.qld.gov.au/environmental_management/land/mining/technical_guidelines.html

- Describe and illustrate the proposed design of any TSF, including any cells for non-flowable tailings within waste rock dumps. Note: a shear strength of greater than 1000 pascals would generally be required of pastes suitable for dry tailings stacking, while pastes with lower shear strength must be contained in a regulated dam. However, the slumping and plastic properties of any tailings considered for disposal by dry stacking will be derived from tests on representative samples and reported in the EIS.
- Describe the source, and assess the suitability, of the materials to be used to construct containment systems. Describe any proposed staging of the construction for any TSF or disposal cells and demonstrate that the design has been produced by a suitably qualified and experienced engineer.
- Conduct, and report on, a risk assessment and describe how it has been used to derive the design storage allowance for any regulated dams. Assess whether the proposed design and methods of disposal would minimise the potential hazards and risks, particularly in relation to the potential impacts of failure caused by mass release from structural failure or contaminant release from overflow. Also, assess whether the proposed design maximises site efficiency, such as by minimising the footprint.
- If some form of co-disposal of fine and coarse rejects is proposed, describe the range of proportions, size fractions and mixing method that would produce a stable deposit.
- Describe the proposed discharge locations and conditions for any TSF. Describe the flow path any discharge would take, illustrated on contour maps, and provide an overview of the potentially affected receiving environment with particular regard to downstream sensitive ecosystems or users of receiving waters. Discharge should be taken to mean any planned or unplanned overflow or release, any leachate, or any potentially contaminated run-off leaving a TSF. Assess in detail the potential impacts of any discharge on downstream sensitive environments or users of receiving waters in the appropriate sections of the EIS and cross-reference to them in this section.
- Describe the proposed monitoring network and regime that would be used to detect any leak from the TSF.
- Describe the proposed measures to be used to decommission any TSF or dump used for the disposal of tailings. Assess any legacy issues for the subsequent landholder.
- Provide a detailed description of tailings disposal facilities stability, capping and rehabilitation, including hydraulic performance of the tailings disposal facilities during operation and post-decommissioning.

Solid waste disposal

- Describe the quantity and quality of solid wastes (other than waste rock, subsoil and tailings addressed in other sections) and the proposed methods of their disposal. Show the proposed location on a map of an appropriate scale. Describe

site suitability, dimensions and volume of any landfill, including its method of construction.

Liquid waste

- Describe the origin, quality and quantity of wastewater and any immiscible liquid (two substances not capable of combining) waste originating from the project other than that addressed in other sections. Pay particular attention to the capacity of wastes to generate acid, and saline or sodic (containing sodium) wastewater. A water balance for the proposal and processing plant is required to account for the estimated usage of water.

3.10 Transport

Present the transport assessment in separate reports for each project-affected mode (road, rail, air and sea) as appropriate. These assessment reports should provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level.

3.10.1 Existing infrastructure

Describe (using maps and tables) the extent, condition and capacity of the existing transport infrastructure on which the project will depend. Identify road rest area infrastructure locations and facilities.

3.10.2 Transport tasks and routes

Describe (using 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. Include the following:

- expected volumes of project inputs and outputs of transported raw materials, wastes, hazardous goods, finished products for all phases of the project
- how identified project inputs and outputs will be moved through the transport network (volume, composition, trip timing and routes)
- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- likely heavy loads, wide loads and over-dimensional/indivisible loads (volume, composition, timing and routes) highlighting any vulnerable bridges and structures along proposed routes
- any proposed new, or alterations to, transport-related infrastructure required by the project (as distinct from impact mitigation works), including modifications to roads for access works and realignments, rail lines (including level crossings and services) and air and sea port facilities

- details of hazardous material transport, including fuel or other combustible material. This should be considered in relation to the Transport Operations (Road Use Management – Dangerous Goods) Regulation 2008 and the Transport Infrastructure (Dangerous Goods by Rail) Regulation 2008.

3.10.3 Potential impacts and mitigation measures

Impact assessment reports should include:

- details of the adopted assessment methodology (for impacts on roads: the road impact assessment report in general accordance with the *Guidelines for Assessment of Road Impacts of Development*)[55]
- description of input data and assumptions
- a summary of consultation undertaken with transport authorities regarding scope of impact assessment and methodology of the assessment.

Assess project impacts on:

- capacity, safety, local amenity, efficiency and condition of transport operations, services and assets (from either transport or project operations)
- possible interruptions to transport operations
- the natural environment within the jurisdiction of an affected transport authority (e.g. road and rail corridors)
- the nature and likelihood of product-spill during transport if relevant
- driver fatigue for workers and their families travelling to and from regional centres and key destinations. Use available research from Government agencies and organisations to assess driver fatigue and crash statistics and available guidelines on rest area location and design
- any existing or proposed strategies for public passenger transport, school bus transport and active transport. Address, where relevant, requirements of Part 2A of the *Transport Planning and Coordination Act 1994* (Qld)
- access to transport for people with a disability
- road impacts, assessing the project's impacts on:
  - the safety, efficiency and condition of road operations and assets (from either transport or project operations)
  - overland water flows and their interaction with the road network
  - any existing or proposed pedestrian/cycle networks

[55] Department of Main Roads, *Guidelines for Assessment of Road Impacts of Development*, Department of Main Roads, Brisbane, 2006, viewed 3 June 2011, www.tmr.qld.gov.au/~/media/ace67ef2-b6c3-46a3-91a7-39f790c309fe/garid_guidelines_200406.pdf

- any existing or proposed school bus routes and pick-up and drop-off times
- any existing public transport networks (assets and services).

- rail impact considerations, assessing the project's impacts on:
  - the amenity and health of adjacent land users as a result of dust, noise and vibration
  - the location and nature of proposed rail-road crossings and the requirement for safety measures.
- sea port and maritime impact considerations, assessing the project's impacts on:
  - the ongoing operation of existing sea port facilities, including capacity of throughput and any land-use impacts as a result of the project's operations
  - maritime-related issues, including vessel traffic management, navigational aids and ship-sourced pollution, in waters outside of the control of port authorities. Define mitigation strategies in general accordance with *Maritime Safety Queensland guidelines for major development proposals*[56].The guideline specifies the minimum information required by Maritime Safety Queensland to evaluate significant development proposals.

3.10.4 Infrastructure alterations

Detail:

- any proposed alterations or new transport-related infrastructure and services required by the project (as distinct from impact mitigation works)
- construction of any project-related plant, utilities and services (including rest area amenities), within or impacting on the jurisdiction of any transport authority.

3.10.5 Transport management strategies

Discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. Prepare these mitigation strategies in close consultation with relevant transport authorities and consider those authorities' works programs and forward planning.

Provide recommendations regarding mitigating impacts on existing property access, traffic safety, roadway and intersection capacity, to ensure an appropriate level of service is maintained. Provide conceptual designs of these measures.

Consider the findings of studies and transport infrastructure impact assessments. Explain matters for road use by emergency services, such as designing sufficient width of roads to provide unobstructed access by vehicles.

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[56] Department of Transport and Main Roads, Maritime Safely Queensland Division, *Maritime Safety Queensland Guidelines for Major Development Proposals,* viewed 2 June 2011, http://www.msq.qld.gov.au/Waterways/Major-development-proposals.aspx

Road/rail management planning

Outline:

- strategies to minimise the effects of project transport on existing and future public road or rail corridors
- steps to be taken to prevent access from public roads/rail corridors to the project sites
- strategies to maintain safe access to public road/rail reserves to allow road/rail/pipeline maintenance activities
- process for decommissioning any temporary access to road/rail reserves, e.g. stockpile sites.

Findings of studies and transport infrastructure impact assessments should be an input into preparing a draft road-use management plan. Conditions of approval for transport management impacts should also be detailed in the EMP.

Air services

Describe the air services and their current capacity serving the region. Estimate the project's requirements for air transport to and from these regions, and the services required to supply these projections.

3.11 Indigenous cultural heritage

3.11.1 Description of existing Indigenous cultural heritage values

Describe the existing Indigenous cultural heritage values that may be affected by the project and the environmental values of the cultural landscapes of the project area in terms of the physical and cultural integrity of the landforms.

Describe how, in conjunction with the appropriate Indigenous people, the cultural heritage values were ascertained. This could include:

- the results of any Aboriginal cultural heritage survey undertaken
- the DERM Aboriginal Cultural Heritage Register and Database
- any existing literature relating to Indigenous cultural heritage in the project area.

3.11.2 Potential impacts and mitigation measures

Define and describe the objectives and practical measures for protecting or enhancing Indigenous cultural heritage environmental values. Describe how nominated quantitative standards and indicators may be achieved for cultural heritage management, and describe how the achievement of the objectives will be monitored, assessed and managed.

To the greatest extent practicable, significant cultural heritage areas should be avoided by the project. The EIS should provide an assessment of likely effects on sites of Indigenous cultural heritage values, including but not limited to the following:

- description of the significance of artefacts, items or places of conservation or cultural heritage values likely to be affected by the project and their values at a local, regional and national level
- recommended means of mitigating any negative impact on cultural heritage values and enhancing any positive impacts.

As a minimum, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care.

During the EIS process, the proponent should initiate either a native title agreement (NT agreement), as defined under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act) that includes management and protection strategies for Indigenous cultural heritage, or a cultural heritage management plan (CHMP) under the ACH Act. An NT agreement or an approved CHMP, in a form which complies with Part 7 of the ACH Act, will ensure that the project meets the Aboriginal cultural heritage duty of care imposed by the ACH Act.

If an NT agreement is not finalised or a CHMP has not been approved when the EIS is submitted to the Coordinator-General, the following must be provided:

- an outline of the draft CHMP or draft plan within the NT agreement that addresses management and protection strategies for cultural heritage, subject to any confidentiality provisions, outlining the position of the relevant parties
- details of the proposed steps and timeframes for finalising the CHMP or NT agreement.

An NT agreement or CHMP should be negotiated between the proponent and the appropriate native title/Indigenous parties and should address and include the following:

- a process for including Indigenous people associated with the development areas in protecting and managing Indigenous cultural heritage
- processes for mitigating, managing and protecting identified cultural heritage sites and objects in the project areas, including associated infrastructure developments, during both the construction and operational phases of the project
- provisions for managing the accidental discovery of cultural material, including burials
- a clear recording process to assist initial management and recording of accidental discoveries
- a cultural heritage induction for project staff

- developing a cultural heritage awareness program to be incorporated into the contractor/employee manual and induction manual. This is to be in the form of a plain language, short document that is easy for contractors and staff 'on the ground' to understand
- a conflict resolution process.

3.12 Non-Indigenous cultural heritage

3.12.1 Description of existing non-Indigenous cultural heritage values

Include a cultural heritage study that describes non-Indigenous cultural heritage sites and places, and their values including the following:

- consultation with:
  - the Australian Heritage Places Inventory
  - the Queensland Heritage Register and other information regarding places of potential non-Indigenous cultural heritage significance
  - any local government heritage register
  - any existing literature relating to the heritage of the affected areas
- liaison with relevant individuals, community groups and organisations (e.g. the Collinsville Connect Telecentre, property owners/residents and local historical societies) concerning:
  - places of non-Indigenous cultural heritage significance
  - opinion regarding significance of any cultural heritage places located or identified.
- locations of culturally and historically significant sites, shown on maps, that are likely to be impacted by the project
- a constraints analysis of the proposed project area to identify and record non-Indigenous cultural heritage places
- desktop literature review of:
  - local, regional and thematic histories
  - primary sources as appropriate
  - any existing literature available from Queensland Government sources or provided to the consultants by local community groups and organisations relating to the affected areas
  - any other relevant heritage surveys, reports and publications.
- description of the significance of artefacts, items or places of conservation or non-Indigenous cultural heritage value likely to be affected by the project and their values at a local, regional, state and national level.

The desktop analysis and consultation should determine what level of field survey is necessary to provide for ground-truthing of expected heritage occurrences. A systematic non-Indigenous cultural heritage field survey should be undertaken by an appropriately qualified cultural heritage practitioner, unless this is shown not to be necessary following the results of desktop analysis and consultation.

3.12.2 Potential impacts and mitigation measures

Assess any potential impacts on sites of non-Indigenous cultural heritage values, and propose measures to avoid or mitigate impacts, including but not limited to the following:

- strategies to manage places of historic heritage significance, taking account also of community interests and concerns
- recommended means of enhancing any positive impacts
- practical measures for recognising, reporting and preserving cultural heritage material
- a process for managing yet undiscovered values should they become apparent during development of the project
- training that will be provided to site personnel during the site induction
- a plain English manual summarising the training that will be given to all site workers for their future reference.

As a minimum, investigation, consultation, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care, including those under the *Queensland Heritage Act 1992*.

4 Social values and management of impacts

4.1 Description of existing social values

The social impact assessment (SIA) should be conducted in consultation with the Queensland Government Social Impact Assessment Unit. Matters to be considered include the social and cultural area, community engagement, a social baseline study, a workforce profile, potential impacts and mitigation measures and management strategies.

4.1.1 Social and cultural area

The SIA should define the project's social and cultural area of influence, including the local, district, regional and state level as relevant, taking into account the:

- potential for social and cultural impacts to occur
- location of other relevant proposals or projects

- location and types of physical and social infrastructure, settlement and land use patterns
- social values that might be affected by the project (e.g. integrity of social conditions, visual amenity and liveability, social harmony and wellbeing, and sense of community)
- indigenous social and cultural characteristics such as native title rights and interests and cultural heritage.

4.1.2 Community engagement

Consistent with national and international good practice, the proponent should engage at the earliest practical stage with likely affected parties to discuss and explain the project, and to identify and respond to issues and concerns regarding social impacts.

Detail the community engagement processes used to conduct open and transparent dialogue with stakeholders. This dialogue should include the project's planning and design stages and future operations including affected local and state authorities. Engagement processes will involve consideration of social and cultural factors, customs and values, and relevant consideration of linkages between environmental, economic, and social impact issues.

4.1.3 Social baseline study

A targeted baseline study of the people residing in the project's social and cultural area is required to identify the project's critical social issues, potential adverse and positive social impacts, and strategies and measures developed to address the impacts. The social baseline study should be based on qualitative, quantitative, and participatory methods. It should be supplemented by community engagement processes, and reference relevant data contained in local and state government publications, reports, plans, guidelines and documentation, including regional plans and, where available, community plans.

The social baseline study should describe and analyse a range of demographic and social statistics determined relevant to the project's social and cultural area including:

- major population trends/changes that may be occurring irrespective of the project
- total population (the total counted population for the social and cultural area and the full-time equivalent transient population), 18 years and older
- estimates of population growth and population forecasts resulting from the proposal
- family structures
- age and gender distributions
- education, including schooling levels

- health and wellbeing measures
- cultural and ethnic characteristics
- the Indigenous population including age and gender
- income including personal and household
- labour force by occupation and industry
- housing costs (monthly housing repayments (per cent of dwellings in each category), and weekly rent (per cent dwellings in each category), housing tenure type and landlord type, household and family type
- housing availability and affordability:
  - the rental market (size, vacancy rate, seasonal variations, weekly rent by percentage dwellings in each category)
  - the availability and typical costs of housing for purchase, monthly housing repayments by percentage dwellings in each category
  - the availability of social housing
- disability prevalence
- the social and economic index for areas, index of disadvantage—score and relative ranking
- crime, including domestic violence
- any other indicators determined through the community engagement process as relevant.

The social baseline study should take account of current social issues such as:

- the social infrastructure including community and civic facilities, services and networks (for definition see *South East Queensland Regional Plan 2005–2026: Implementation Guideline No.5—Social infrastructure planning*)[57]
- settlement patterns including the names, locations, size, history and cultural aspects of settlement in the social and cultural area
- the identity, values, lifestyles, vitality, characteristics and aspirations of communities in the social and cultural area, including Indigenous communities
- land use and land ownership patterns including:
  - rural properties, farms, croplands and grazing areas including on-farm activities near the proposed activities
  - the number of properties directly affected by the project

[57] Department of Infrastructure, *South East Queensland Regional Plan 2005–2026: Implementation Guideline No. 5: Social infrastructure planning*, Department of Infrastructure, Brisbane, 2007, viewed 3 June 2011, http://www.dip.qld.gov.au/resources/guideline/ImplementationGuideline5.pdf

- the number of families directly and indirectly affected by the project including Indigenous traditional owners and their families, property owners, and families of workers either living on the property or workers where the property is their primary employment

- use of the social and cultural area for forestry, fishing, recreation, business and industry, tourism, aquaculture, and Indigenous cultural use of flora and fauna.

4.1.4 Workforce profile

The SIA should include a profile of the workforce that describes 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
- estimated number of people to be employed during construction and operation, and arrangements for their transport to and from the project areas, including proposed use of regional or charter air services.

Estimates should be provided according to occupational groupings, employment tenure (full-time/part-time, permanent/contract) and variations in the workforce numbers for the duration of the project and show anticipated peaks in worker numbers during the construction period.

Provide an outline of recruitment schedules and policies for recruiting workers, addressing recruitment of local and non-local workers including Indigenous workers, people from culturally and linguistically diverse backgrounds and people with a disability.

If re-locatable camp sites are to be used to accommodate the workforce, provide details on the number, size, location (shown on a map), proximity of camps to the construction site, management (including operating arrangements in regard to alcohol supply and consumption) and typical facilities to be provided for these camp sites such as first aid and medical facilities. Information should outline any local government or other regulatory approvals required to establish and operate such camps, including building, health and safety and waste disposal purposes.

Provide information on the location of other major projects or proposals under study within the social and cultural area, together with workforce numbers.

4.2 Potential impacts

Assess and describe the type, level and significance of the project's social impacts (both beneficial and adverse) on the social and cultural area, based on outcomes of community engagement processes and the social baseline study. Furthermore:

- describe and summarise outcomes of community engagement processes including the likely response of the affected communities, including Indigenous people

- include sufficient data to enable affected local and state authorities to make informed decisions about the project's effect on their business and provision of services to plan for the provision of social infrastructure in the project's social and cultural area. If the project is likely to result in a significant increase in the population of the area, then the proponent should consult the relevant management units of the state authorities and summarise the results of the consultations
- address direct, indirect and secondary impacts from any existing projects and the proposed project including an assessment of the size, significance, and likelihood of these impacts at the local and regional level. Consider the following:
  - key population/demographic shifts; disruptions to existing lifestyles, the health and social wellbeing of families and communities; social dysfunction including alcohol and drugs, crime, violence, and social or cultural disruption due to population influx
  - the needs of vulnerable groups including women, children and young people, the aged and people with a disability
  - Indigenous peoples including cultural property issues
  - local, regional and state labour markets, with regard to the source of the workforce presented according to occupational groupings of the workforce. Detail whether the proponent, and/or contractors, is likely to employ locally or through other means and whether there are initiatives for local employment business opportunities
  - proposed new skills and training related to the project including the occupational skill groups required and potential skill shortages anticipated
  - how much service revenue and work from the project would be likely to flow to the project's social and cultural area
  - impacts of construction and operational workforces, their families, and associated contractors on housing and accommodation availability and affordability, land use and land availability. Discuss the capability of the existing housing and rental accommodation, to meet any additional demands created by the project, including direct impacts on Indigenous people.

Evaluate and discuss the potential cumulative social impacts resulting from the project including an estimation of the overall size, significance and likelihood of those impacts. In this context, 'cumulative impacts' is defined as the additional impacts on population, workforce, accommodation, housing, and use of community infrastructure and services, from the project, and other proposals for development projects in the area, which are publicly known or communicated by the Queensland Government, if they overlap the proposed project in the same timeframe as its construction period.

4.2.1 Mitigation measures and management strategies

For identified social impacts, present social impact mitigation strategies and measures to address the:

- recruitment and training of the construction and operational workforces and the social and cultural implications this may have for the host community, including if any part of the workforce is sourced from outside the social and cultural area
- housing and accommodation issues, in consultation with relevant local authorities and state government agencies, with proposals for accommodating the project workforce and their families that avoid, mitigate or offset any short and medium-term adverse effects on housing affordability and availability, including the rental market, in the social and cultural area
- demographic changes in the profile of the region and the associated sufficiency of current social infrastructure, particularly health and welfare, education, policing and emergency services
- adequate provision of education, training and employment for women, people with a disability, and Indigenous peoples
- collaborative stakeholder engagement strategies and partnership arrangements to develop and implement project benefit strategies and social impact mitigation measures.

Describe any consultation about acceptance of proposed mitigation strategies and how practical management and monitoring regimes are proposed to be implemented.

Present a draft social impact management plan (SIMP) that promotes an active and ongoing role for impacted communities and local authorities through the project life cycle. The draft SIMP should cover:

- assignment of accountability and resources
- updates on activities and commitments
- mechanisms to respond to public enquiries and complaints
- mechanisms to resolve disputes with stakeholders
- periodic evaluation of the effectiveness of community engagement processes
- practical mechanisms to monitor and adjust mitigation strategies and action plans
- action plans to implement mitigation strategies and measures.

The draft SIMP should be consistent with the requirements set out in *Social impact assessment: Guideline to preparing a social impact management plan*.[58]

[58] Department of Infrastructure and Planning, *Social impact assessment: Guideline to preparing a social impact management plan*, Department of Infrastructure and Planning, Brisbane, 2010, viewed 3 June 2011, www.dlgp.qld.gov.au/resources/guideline/simp-guideline.pdf

5 Economies and management of impacts

5.1 Economy

5.1.1 Description of affected local and regional economies

Describe the existing economy in which the project is located and the economies materially impacted by the project. Include:

- a map illustrating the local and regional economies (local government areas) that could be potentially affected by the project
- gross regional product or other appropriate measure of annual economic production
- population
- labour force statistics
- economic indicators
- the regional economy's key industries and their contribution to regional economic income
- infrastructure
- availability and prices of goods and services
- a description of the regional economy's key industries and their contribution to regional economic income including historical descriptions of large-scale resource developments and their effects in the region
- a discussion on regional resource endowment, competitive advantage and expected future growth
- a description of the key regional markets relevant to the project:
  - labour market
  - housing and land markets and their values, particularly rental accommodation which may be available for the project workforce
  - construction services and building inputs market
  - regional competitive advantage and expected future growth

With regard to the region's key industries and factor prices, provide information on:

- current input costs (wage rates, building costs, housing rent etc.)
- types and numbers of businesses
- land values in the region by type of use.

5.1.2 Potential impacts and mitigation measures

The potential impacts should consider local, regional, state and national perspectives as appropriate to the scale of the project.

The analysis should describe both the potential and direct economic impacts including estimated costs, if material, on industry and the community, assessing the following:

- property values
- industry output
- employment
- the indirect impacts likely to flow to other industries and economies from the development of the project (also considering the implications of the project for future development)
- the contribution to local, regional and state economic objectives, strategies, plans and policies for the area or industry sector (including investment, industry, employment, skills plans and policies)
- stimulus (flow on/second order effects) for industry, small business, employment, incomes and innovation
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups.

Analyse the economic impact of wet season effects on mine production and export performance. Demonstrate through the provision of evidence, including modelling, plans for the optimisation of mining operations and rail transport operations to ensure the efficient delivery of product coal to port.

Present strategies to mitigate, minimise or avoid the adverse economic impact of reduced coal production levels and export delays caused by flooding and wet seasons impacting on mine stockpile levels and scheduled rail transportation of product to port.

Strategies for local participation

The assessment of economic impacts should outline strategies for local participation, including:

- strategies for assessing the cost effectiveness of sourcing local inputs from the regional economy during the construction, operation and rehabilitation phases of the project
- employment strategies for local residents including members of Indigenous communities and people with a disability, including a skills assessment and recruitment and training programs to be offered
- strategies responding to relevant government policy, relating to:

- the level of training provided for construction contracts on Queensland Government building and construction contracts, with regard to the *Queensland Government Building and Construction Contracts Structured Training Policy*[59] (the 10 per cent policy)
- Indigenous employment opportunities, with regard to the *Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects*[60] (the 20 per cent policy)
- the use of locally sourced goods and services, with regard to the *Local Industry Policy.*[61]

Impact upon property management

Address the current and future management processes for adjacent properties that are likely to be impacted by the project during construction and/or operation. Mention the:

- impact of the project on existing agricultural land uses and management practices (e.g. disruption to stockyards, fences, water points, sowing or harvesting of crops, movement of livestock, agricultural machinery and any loss of agricultural land)
- range of measures required to mitigate real and potential disruptions to rural practices and management of properties.

5.2 Sustainable development

Provide a comparative analysis of how the project conforms to the objectives for 'sustainable development'—see the *National Strategy for Ecologically Sustainable Development*.[62]

Consider the cumulative impacts (both beneficial and adverse) of the project from a life-of-project perspective, taking into consideration the scale, intensity, duration and 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.

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[59] Department of Education and Training, 10 Per cent Training Policy, viewed 3 June 2011 http://training.qld.gov.au/industry/10percent-policy.html

[60] Department of Employment and Training, 2004. *Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects* viewed 3 June 2011. http://www.employment.qld.gov.au/pdf/eii/policy-building-&-civil-construction-projects.pdf

[61] Department of Employment, Economic Development and Innovation, Local Industry Policy October 2010 and Guideline May 2011, viewed 3 June 2011, http://www.industry.qld.gov.au/key-industries/208.htm

[62] Ecologically Sustainable Development Steering Committee, *National Strategy for Ecologically Sustainable Development*, Australian Government Publishing Service, Canberra, 1992, viewed3 June 2011, www.environment.gov.au/about/esd/publications/strategy/index.html

6 Hazard and risk

6.1 Hazard and risk assessment

Describe the potential hazards and risks to people and property that may be associated with the project, which may include but are not restricted to:

- identifying potential hazards, accidents, spillages and abnormal events that may occur during all stages of the project, including possible frequency of occurrence
- identifying all hazardous substances to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards such as snakes and disease vectors
- potential natural events and implications related to climate change.

Undertake a preliminary risk assessment for all components of the project, as part of the EIS process in accordance with *Australia/New Zealand AS/NZS ISO 31000:2009 Risk management—Principles and guidelines.* With respect to risk assessment, the EIS should:

- deal comprehensively with external and on-site risks including transport risks
- assess risks during the construction, operational and decommissioning phases of the project
- include an analysis of the consequences of each hazard on safety in the project area, examining the likelihood of both individual and collective consequences, involving injuries and fatalities to workers and to the public
- present quantitative levels of risks from the above analysis.

Provide details on the safeguards that would reduce the likelihood and severity of hazards, consequences and risks to persons, within and adjacent to the project area(s).

Present a comparison of assessed and mitigated risks with acceptable risk criteria for land uses in and adjacent to the project area(s).

Assess the potential for mosquito breeding sites to be created by the project as part of the preliminary risk assessment. Should breeding sites have the potential to be be created, development of a mosquito management plan is to be considered for the entire site and in particular, areas where it is intended to pond significant volumes of water. (Refer to *Guidelines to minimise mosquito and biting midge problems in new development areas).*[63]

Provide a draft risk management plan.

[63] Queensland Health *Guidelines to minimise mosquito and biting midge problems in new development areas,* viewed 2 June 2011, http://www.health.qld.gov.au/ph/documents/cdb/14804.pdf

6.2 Cumulative risk

The risk assessment is to address the potential impacts that may occur in normal on-site day-to-day activities during the construction and/or operation of the facilities. Furthermore, determine the level of change that may result on the risk contours of other relevant existing or proposed industrial facilities (where details of such proposed facilities are provided by the Queensland Government to the proponent or otherwise published) in the area as a result of the proposed project. Individual risk criteria should be used to limit risks to individual workers and members of the public. Societal risk criteria should be used to limit risk to the affected population as a whole.

Identify and adopt, where appropriate, any changes to operating or storage procedures that would reduce the possibility of these events occurring, or reduce the severity of the events should they occur. Present draft risk management plans for the construction and operational phases of the project.

6.3 Health and safety

6.3.1 Description of public health and safety community values

Describe the existing health and safety values of the community, workforce, suppliers and other stakeholders in terms of the environmental factors that can affect human health, public safety and quality of life, such as air pollutants, odour, lighting and amenity, dust, noise and water.

6.3.2 Potential impact and mitigation measures

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

Assess the cumulative effects on public health values and occupational health and safety impacts on the community and workforce from project operations and emissions. Recommend any practical monitoring regimes in this section.

Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed, covering factors such as air emissions, odour, dust and noise. Also recommend practical monitoring regimes in this section.

Assess and discuss driver fatigue for workers and their families travelling to and from regional centres and key destinations. Include cross-references to the transport section of these TOR in assessing this issue.

6.4 Emergency management plan

Develop emergency planning and response procedures in consultation with state and regional emergency service providers including local police services.

Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans from worker camp facilities) for the range of situations identified in the risk assessment developed in this section. This includes strategies to deal with natural disasters during construction, operation and decommissioning of the project. Take into account the response capabilities of the Queensland Fire and Rescue Service to areas where limited infrastructure may be constructed.

Present preliminary information on the design and operation of proposed safety/contingency systems to address significant emergency issues delineated in the risk assessment, together with at least the following areas of emergency:

- floods
- terrorist attack
- major health concerns such as flu pandemics
- fire prevention/protection
- explosions
- leak detection/minimisation
- release of contaminants
- emergency shutdown systems and procedures.

In regard to fires, outline strategies to manage the provision of:

- fire management systems to ensure the retention on site of fire water or other fire suppressants used to combat emergency incidents
- building fire safety measures for any construction or permanent accommodation
- details of any emergency response plans and bushfire mitigation plans under *State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*[64]
- on-site firefighting equipment provided and the level of training of staff who will be tasked with emergency management activities
- detailed maps showing the plant outline, worker camp facilities potential hazardous material stores, incident control points, fire fighting equipment, emergency entry and exit points to site facilities etc.
- an outline of any dangerous goods stores associated with the plant operations, including fuel storage and emergency response plans.

[64] Department of Local Government and Planning, Department of Emergency Services, *State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, 2003, viewed 2 June 2011, www.emergency.qld.gov.au/publications/spp/pdf/spp.pdf

Present outlines of emergency planning and response strategies to deal with relevant incidents above, which have been determined in consultation with state and regional emergency service providers and police services, and which show integration of emergency services into the plans.

Outline the training plan for emergency management and mass casualty incident management.

Present preliminary plans for emergency medical response and transport and first aid matters with involvement of the relevant state agencies (such as the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland).

7 Cumulative impacts

Summarise the project's cumulative impacts and describe these impacts in combination with those of existing or proposed project(s) publicly known or advised by the Queensland Government to be in the region, to the greatest extent practicable. Cumulative impacts should be assessed with respect to both geographic location, health and safety, demand for services, social values and environmental values. In particular, consider the cumulative impact on the regional waterways and the biological condition of downstream waterways using appropriate spatial and temporal ratings.

Conduct a strategic assessment of the cumulative impacts of the project's impact on natural environment (including the Burdekin River Basin in which all the tenures lie), landowners, agricultural activities and communities within the Northern Bowen Basin. The project, including its associated infrastructure (e.g. pipeline, power upgrade and rail facilities), should be evaluated in terms of cumulative impacts on air and water quality and biodiversity.

Explain the methodology used to determine the cumulative impacts of the project, detailing the range of variables considered (including relevant baseline or other criteria upon which the cumulative aspects of the project have been assessed, where applicable).

8 Environmental management plan

The EMPs should encompass both the construction and operation phases of the project. The EMPs should be developed from, and be consistent with, the information in the EIS. The EMPs must address discrete project elements and provide life-of-proposal control strategies. Each plan must be capable of being read as a stand-alone document without reference to other parts of the EIS.

The EMPs must comprise the following components for performance criteria and implementation strategies:

- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, performance standards and associated measurable indicators, performance monitoring and reporting
- impact prevention or mitigation actions to implement the commitments
- corrective actions to rectify any deviation from performance standards
- 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
  - a rehabilitation program for land proposed to be disturbed under each relevant aspect of the proposal.

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 (e.g. 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).

The proponent's commitments to environmental performance, as described in the EMP, may be included as Coordinator-General's conditions to ensure the commitments are met. Therefore, the EMP is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them. Consultation with relevant state agencies is recommended during the preparation of the EMPs for construction, operation and decommissioning phases. Agencies

include the Queensland Fire and Rescue Service, Emergency Management Queensland and Queensland Ambulance Service.

The EMP for mining activities must be consistent with the content requirements of the EP Act.

9 Matters of national environmental significance

The project is a controlled action under the EPBC Act (EPBC 2010/5778) and a significant project under the SDPWO Act. The EIS will be prepared pursuant to the bilateral agreement between the Commonwealth and Queensland governments for the purposes of the Commonwealth Government's assessment under part 8 of the EPBC Act. The EIS must address potential impacts on the MNES that were identified when the project was determined to be a controlled action.

This section should bring together assessments of impacts on matters of national environmental significance in other chapters (e.g. water resources, flora and fauna, cultural heritage and cumulative impacts etc.) and produce a stand-alone assessment in a format suited for assessment under the EPBC Act.

The controlling provisions under the EPBC Act are:

- sections 18 and 18(a) (listed threatened species and communities)
- sections 20 and 20(a) (listed migratory species).

The project should initially be assessed in its own right followed by an assessment of the cumulative impacts related to all known proposed similar developments in the region with respect to each controlling provision and all identified consequential actions. Cumulative impacts not solely related to the project development should also be assessed.

Predictions of the extent of threat (risk), impact and the benefits of any mitigation measures proposed, should be based on sound science and quantified where possible. Reference all sources of information relied upon and provide an estimate of the reliability of predictions. Also identify and evaluate any positive impacts.

The extent of any new field work, modelling or testing should be commensurate with risk and should be such that when used in conjunction with existing information, provides sufficient confidence in predictions that well-informed decisions can be made.

9.1 Introduction

Provide background to the project, including:

- a description of the action including: location and property description, as well as planning, construction and decommissioning phases
- how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action
- a list of persons and agencies consulted during the preparation of the EIS
- the names of, and qualifications and experience of the persons involved in preparing the EIS, including sub-consultants and reviewers
- the environmental record of the proponent, including details of their environmental policy and planning framework and details of any proceedings under a Commonwealth, or state law for the protection of the environment against them
- brief summary of social/economic impacts as a result of the project.

9.2 Impact on listed threatened species and ecological communities

Identify EPBC-listed threatened species and ecological communities identified in subsection 9.2.1 that could be affected, directly and indirectly and as a consequence of the proposal (including EPBC Act status, distribution, life history, habitats).

Consider and assess all potential impacts to listed threatened species and ecological communities for which the project was declared a controlled action that are found to be or may potentially be present in areas that may be impacted by the project. Refer to impacts on suitable habitat present irrespective of whether the species were detected in surveys.

Conduct targeted surveys for listed threatened species and ecological communities to identify the likely presence of listed threatened species, and provide a high level of certainty of their presence or absence from the proposal site.

Describe and map where necessary the distribution, ecology, and habitat preferences of each listed threatened species and ecological community:

- all potential habitat for each species, irrespective of whether species/communities were detected in surveys
- habitat components important for each species such as breeding habitat
- the location of known records (including those from databases and all surveys previously conducted in the project area).

Discuss the relationship between individuals and communities of EPBC-listed threatened species and ecological communities on the proposed site and the regional context of threatened species and ecological communities.

Assess the impacts to the listed threatened species (including habitat) and ecological communities and any others that are found to be or may potentially be present in areas that may be impacted by the project, include evidence based justification for conclusions reached on whether or not a species/community is significantly impacted. Identify which component of the project is of relevance to each species or community or if the threat of impact relates to consequential actions, resulting from:

- a decrease in the size of a population or a long-term adverse affect on an ecological community
- reduction in the area of the species' occupancy or extent of occurrence of the ecological community
- fragmentation of an existing population or ecological community
- disturbance or destruction of habitat critical to the survival of the species or ecological community
- disruption of the breeding cycle of a population
- modification, destruction, removal, isolation or reduction of the availability or quality of habitat to the extent that the species is likely to decline
- modification or destruction of abiotic (non-living) factors (such as water, nutrients or soil) necessary for the ecological community's survival
- the introduction of invasive species that are harmful to the species or ecological community becoming established
- interference with the recovery of the species or ecological community
- action that may be inconsistent with a recovery plan.

Any positive impacts should also be identified and evaluated.

9.2.1 List of listed threatened species and communities potentially affected

Threatened ecological communities

- Natural grasslands of the Queensland Central Highlands and the Northern Fitzroy Basin
- Brigalow - Acacia harpophylla dominant and co-dominant
- Semi-evergreen vine thickets of the Brigalow belt (North and South) Nandeewar Bioregionas

Threatened species

- *Erythrotriorchis radiates*—Red Goshawk
- *Geophaps scripta scripta*—Squatter Pigeon (southern)
- *Neochmia rufficauda ruficauda*—Star Finch (eastern), Star Finch (southern)
- *Poephilla cinta cinta*—Black-throated Finch

- *Dasyurus hallucatua*—Northern Quoll
- *Egernia rugosa*—Yakka Skink
- *Denisonia maculate*—Ornamental Snake
- *Acacia ramiflora*
- *Dicanthium queenslandicum*—King Blue-grass
- *Eucalyptus raveretiana*—Black Ironbox
- *Cycas ophiolitica*
- *Digitaria porrecta*—Finger Panic Grass
- *Rostratula australis*—Australian Painted Snipe
- *Croton Magneticus*

9.3 Impact on listed migratory species

Describe the EPBC-listed migratory species identified in subsection 9.3.1 including EPBC Act status, distribution, life history, habitats etc.); include whether suitable habitat is present and the quantity of habitat being impacted.

Consider and assess the impacts to the listed migratory species identified in subsection 9.3.1 and any others that are found to be or may potentially be present in areas that may be impacted by the project. Identify which component of the project is of relevance to each species or if the threat of impact relates to consequential actions, resulting from:

- the destruction, isolation or modification of habitat important to a migratory species
- the introduction of invasive species in an important habitat that would be harmful to a migratory species
- the disruption of the lifecycle (breeding, feeding, migration, or resting behaviour) of an ecologically important proportion of the population of a migratory species
- interference with the recovery of the species or ecological community
- action that may be inconsistent with a recovery plan.

Also identify and evaluate any positive impacts.

Describe and discuss any mitigation measures proposed to reduce the impact on migratory species and the anticipated benefit of proposed mitigation measures.

9.3.1 List of listed migratory species potentially affected

- *Haliaeetus leaucogaster*—White bellied Sea Eagle
- *Hirundapas caudactus*—White-throated Needletail
- *Hirundo rusitca*—Barn Swallow

- *Merops ornatus*—Rainbow Bee-eater
- *Monarcha melanopsis*—Blac-faced Monarch
- *Myiagra cyanoleuca*—Satin Flycatcher
- *Ardea alba*—Great Egret, White Egret
- *Ardea ibis*—Cattle Egret
- *Gallinago hardwickii*—Latham's snipe, Japanese Snipe
- *Nettapus coromandeliance albipennis*—Australian Cotton Pygmy-goose
- Rostratula benghalensis s. lat—Painted Snipe
- *Apus pacificus*—Fork-tailed Swift.
- *Myiagra cyanoleuca*—Satin Flycatcher
- *Crocodylus porosus*—Salt-water Crocodile, Estuarine Crocodile.

9.4 Mitigation measures and offsets

Describe any mitigation measures proposed to reduce the impacts on the listed threatened species and ecological communities and listed migratory species and include the following elements:

- a description of proposed safeguards and mitigation measures to deal with relevant impacts of the action including mitigation measures proposed to be taken by state governments, local governments or the proponent
- an assessment of the expected or predicted effectiveness of the mitigation measures
- an explanation of any statutory or policy basis for the mitigation measures
- the cost of the mitigation measures.

Describe any proposed offsets for impacts to listed threatened species and ecological communities and listed migratory species.

Discuss offsets with reference to the Australian Government's *Draft Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999*.[65]

[65] Department of the Environment and Water Resources, *Draft Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999*, Department of the Environment and Water Resources, 2007, viewed 3 June 2011, www.environment.gov.au/epbc/publications/pubs/draft-environmental-offsets.pdf

10 Conclusions and recommendations

Make conclusions and recommendations with respect to the project, based on the studies presented, the EMP and conformity of the project with legislative and policy requirements.

11 References

Present all references consulted in a recognised format.

12 Appendices

Include the following appendices in the EIS.

Final terms of reference for this EIS

Include a copy of the final TOR in the EIS.

Terms of reference cross-reference table

Provide a cross-reference table that links the requirements of each section/subsection of these TOR with the corresponding section/subsection of the EIS, where those requirements have been addressed.

Project approvals

Provide a list of the project approvals required by the project.

Consultation report

The report should include the methodology used in the public consultation plan including:

- criteria for identifying stakeholders and the communication methods used (the consultation plan)
- a list of stakeholders identified, including the Commonwealth, Queensland and local government agencies, and/or the affected parties (as defined by the EP Act)
- a summary of the issues raised by stakeholders and the means by which the issues have been addressed
- plans for ongoing consultation to be outlined and included in the EMP.

Study team

List the relevant qualifications and experience of the key study team members and specialist sub-consultants.

Glossary of terms

Provide a glossary of technical terms.

Acronyms and abbreviations

Provide a list of acronyms and abbreviations.

Specialist studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. These may include, but are not limited to:

- air pollution, noise and vibration
- groundwater and surface water hydrology
- geology and geomorphology
- economic studies and/or cost-benefit analyses
- transport studies
- cultural heritage
- waste management
- hazard and risk studies
- land use and land capability studies.

Corporate environmental policy

Attach a copy of the proponent's corporate environmental policy and planning framework document.

List of proponent commitments

Provide a list of all commitments made by the proponent in the EIS, together with a reference to the relevant section in the report.

Acronyms and abbreviations

ACARP	Australia's Coal Industry Research Program
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
AS/NZS	Australian standard/New Zealand standard
CDMP	Coal Dust Management Plan
CHMP	cultural heritage management plan
CHPP	Coal handling and preparation plant
DERM	Queensland Department of Environment and Resource Management(QLD)
DEEDI	Queensland Department of Employment, Economic Development and Innovation(QLD)
DSEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
EIS	environmental impact statement
EMP	environmental management plan
EP Act	*Environmental Protection Act 1994* (Qld)
EPA	former Queensland Environmental Protection Agency (now DERM)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP	*Environmental Protection Policy (water, air, waste, noise)*
ERA	environmentally relevant activity
IAS	initial advice statement
MLA	mining lease application (area)
MNES	matters of national environmental significance (under the EPBC Act)
NC Act	*Nature Conservation Act 1992* (Qld)
NGA	National Greenhouse Accounts
NT agreement	native title agreement
QCoal	QCoal Pty Ltd
RE	regional ecosystem
REDD	Regional Ecosystem Description Database
ROM	run-of-mine
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
SIA	social impact assessment
SIMP	social impact management plan
SPA	*Sustainable Planning Act 2009* (Qld)
The project	Byerwen Coal project
The proponent	Byerwen Coal Pty Ltd
TOR	terms of reference
TSF	tailings storage facility
VM Act	*Vegetation Management Act 1999* (Qld)

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