



# HANCOCK PROSPECTING PTY LTD

Alpha Coal Project Environmental Impact Statement

Volume 4 • 2010

Project Wide  
Appendices

Vol **4** | Project Wide  
Appendices



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# A | Terms of Reference





# **Terms of reference for an environmental impact statement**

## **Alpha Coal project**

**Under Part 4 of the *State Development and Public Works Organisation Act 1971***

**and**

***Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)***

**The Coordinator-General  
June 2009**





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# Synopsis

Hancock Prospecting Pty Ltd (Hancock) proposes to establish a new open cut coal mine in the Galilee Basin, Central Queensland, to service international export energy markets for thermal coal. Hancock's proposal involves four broad components:

1. a coal mine development and processing plant
2. the construction of a mine-to-port railway to transport processed coal to an export terminal on the eastern seaboard
3. the construction of a new coal export terminal to be located at either Abbot Point or Dudgeon Point
4. the development of associated infrastructure including an airport near the mine site and power and water supply infrastructure.

The Coordinator-General has declared the Alpha Coal 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* (SDPWOA).

The Commonwealth Government has determined that the project constitutes a controlled action pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The declaration of the project as a significant project does not indicate support for, or approval of, the project by the Coordinator-General or the Queensland Government. Rather it is a requirement for the project to undergo a rigorous environmental impact statement process.

The EIS process is to be administered in parallel by the Department of Infrastructure and Planning for the Coordinator-General under the SDPWOA on behalf of the Queensland Government and by the Commonwealth Department of the Environment, Water, Heritage and the Arts under the EPBC Act, on behalf of the Australian Government. The term EIS used in these terms of reference (TOR) should be interpreted as satisfying the impact assessment requirements for both jurisdictions.

Terms of reference (TOR) set out the requirements, both general and specific, that the proponent should address in preparing the EIS. These TOR have been prepared having regard to comments/submissions received on draft TOR released for public comment over the period 7 February 2009 – 9 March 2009. These TOR are presented in two broad categories:

- Part A: Information and advice on the preparation of the EIS
- Part B: Specific requirements—contents of the EIS.

# Abbreviations

The following abbreviations have been used in this document:

<b>APSDA</b>	Abbot Point State Development Area
<b>CHMP</b>	Cultural heritage management plan
<b>CHPP</b>	Coal handling preparation plant
<b>CLR</b>	Contaminated Land Register
<b>CSM</b>	Coal seal methane
<b>DEEDI</b>	Qld Department of Employment, Economic Development & Innovation
<b>DERM</b>	Qld Department of the Environment & Resource Management
<b>DEWHA</b>	Australian Government Department of Environment, Water, Heritage & the Arts
<b>DIP</b>	Qld Department of Infrastructure and Planning
<b>DME</b>	Former Qld Department of Mines & Energy – now part of DEEDI
<b>DMR</b>	Former Qld Department of Main Roads – now part of DEEDI
<b>DNRW</b>	Former Qld Department of Natural Resources & Water – now part of DERM
<b>DPIF</b>	Department of Primary Industries and Fisheries
<b>DTM</b>	Qld Department of Transport and Main Roads
<b>EIS</b>	Environmental impact statement
<b>EM plan</b>	Environmental management plan
<b>EMR</b>	Environmental Management Register
<b>EP Act</b>	<i>Environmental Protection Act 1994</i>
<b>EPA</b>	Former Qld Environmental Protection Agency, now part of DERM
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
<b>EPC</b>	Exploration permit for coal
<b>EPP (Air)</b>	<i>Environmental Protection (Air) Policy 2008</i>
<b>EPP (Noise)</b>	<i>Environmental Protection (Noise) Policy 2008</i>
<b>EPP (Waste)</b>	<i>Environmental Protection (Waste) Policy 2000</i>
<b>EPP (Water)</b>	<i>Environmental Protection (Water) Policy 1997</i>



<b>ESD</b>	Environmentally sustainable development
<b>GBRWHA</b>	Great Barrier Reef World Heritage Area
<b>Hancock</b>	Hancock Prospecting Pty Ltd
<b>IAS</b>	Initial advice statement as defined by Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>
<b>IPA</b>	<i>Integrated Planning Act 1997</i>
<b>MDL</b>	Mineral development license
<b>MLA</b>	Mining lease application issued pursuant to the <i>Mineral Resources Act 1989</i>
<b>MNES</b>	Matters of National Environmental Significance, as defined under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
<b>Mtpa</b>	Million tonnes per annum
<b>MRA</b>	<i>Mineral Resources Act 1989</i>
<b>NC Act</b>	<i>Nature Conservation Act 1992</i>
<b>PCQ</b>	Ports Corporation of Queensland
<b>QR</b>	Queensland Rail
<b>ROM</b>	Run of mine
<b>SDPWOA</b>	<i>State Development and Public Works Organisation Act 1971</i>
<b>the project</b>	Alpha Coal project
<b>the proponent</b>	Hancock Prospecting Pty Ltd
<b>TOR</b>	Terms of reference as defined by Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>

# Part A—General information and administrative procedures

## 1. Project summary

Hancock Prospecting Pty Ltd (Hancock) proposes to establish a mine in the Galilee Coal Basin, Central Queensland, to service international export energy markets for thermal coal. In addition to the mine, the project would involve construction of a railway, approximately 500 km long dependent upon the final option chosen, to transport processed coal to a new export terminal on the coast at either Abbot Point, located approximately 25 km north-west of Bowen or Dudgeon Point, located approximately 5 km north-west of Hay Point, near the city of Mackay. Water and power supply infrastructure to service the mine and port would also be necessary (see Attachment 1 for project footprint).

The company's coal tenements are situated approximately 38 km north-west of Alpha and 450 km west of Rockhampton. Hancock currently holds two mineral development licences (MDL) (MDL 285 and 333) in the Galilee Basin, and has applied for an exploration permit for coal (EPC) (EPC Application 1210) over an area immediately to the east of MDL 285 and MDL 333. Hancock intends to apply for a mining lease (ML) covering the mining area of the project. To date, Hancock has identified a measured, indicated and inferred resource of approximately 4 billion tonnes of coal within the areas of its Mineral Development Licence.

The rail and port facilities will be designed to transport, load and ship respectively greater capacity levels than Hancock's forecast production, to cater primarily for neighbouring Galilee Basin and Bowen Basin producers. Should additional coal production volumes be available in the Galilee Basin and Bowen Basin Hancock shall endeavour to make additional capacity available. It is expected that additional coal volumes from neighbouring and down stream producers will require a total system capacity of potentially 80 million tonnes per annum (Mtpa).

### **Coal mine and processing plant**

The proposed open cut mine is expected to have an initial export capacity of 30 Mtpa with a mine life in excess of 30 years. Subject to project approvals, initial exports are targeted for 2013 (see Attachment 2).

Hancock proposes to develop an approximately 40 Mtpa run of mine (ROM) open cut thermal coal operation. Initially, all product coal is planned for export, however domestic use will be explored as the project has the potential for developing significant underground reserves. The project has an expected mine life of more than 30 years, with sufficient Joint Ore Reserves Committee compliant resources to significantly extend the project life beyond 30 years.

The project will consist of multiple open cut pits where overburden will be removed by truck and shovel, excavators and dragline. Coal will be mined and transported from the pits by truck/shovel operations. The 30 Mtpa rate of saleable production is expected to be achieved in the fifth year of mining activities.

Raw coal will be processed at a ROM facility where it will be reduced in size for further processing. Sized raw coal will be transferred via conveyor to a multi-module coal preparation plant. The mined coal will be washed using a conventional wash plant. A tailings dam will therefore be required to contain washery fines. Overburden will be stockpiled in out-of-pit spoil dumps and will also be used to partially backfill the pits.



In addition, installation of other project related infrastructure would include, but not be limited to, service and haul roads, power network or on-site power generation facilities, accommodation camps, water networks and an aerodrome. It is proposed that the water requirements for the mine would be supplied from a combination of groundwater pumped from on-site aquifers and a water pipeline from the Burdekin Falls Dam.

The EIS should consider the impact on environmental values of all exploration and mining activities relating to the development and operation of the mine site and associated infrastructure and utilities.

### **Mine to port railway**

The project includes the construction and operation of a new railway to transport coal to the chosen port location. The two port locations under consideration are Abbot Point and Dudgeon Point (see Attachment 1).

Detailed rail operations would be confirmed during the engineering and design phases of the project. The proposed rail systems would be designed to consider the following factors:


- capacity to transfer initially 30 Mtpa of coal from the mine to the preferred port, with the potential to increase the capacity of the rail system to transport in excess of 80 Mtpa to accommodate coal from other producers
- designed for diesel/electric train operations
- coal transport 24 hours a day, seven days a week for up to 52 weeks per year
- a maximum operating speed of 80 km per hour when fully-loaded
- narrow gauge, standard gauge or dual gauge, depending on the most viable business case option, including potential passing loops.

The mine to Abbot Point rail corridor option includes three variations:

- Option 1C: This rail corridor option includes 457 km of greenfield railway extending from the mine in a north north-easterly direction to Eaglefield and Newlands. It then runs adjacent to the Queensland Rail (QR) Newlands line to join the Abbot Point rail corridor. The final approach to the port and rail loops would be on a greenfield track. Total distance from mine-to-port is 457 km
- Option 1D: This rail corridor includes 162 km of new railway to connect to the existing QR line at Blair Athol. This option traverses existing QR lines using narrow gauge rail to Wotonga, and the Northern Missing Link to Newlands, to join the existing rail line to Abbot Point. The final approach to the port and rail loops would be on a greenfield track. The total distance from mine to port is 510 km.
- Option 1E: This rail corridor is a greenfield railway line to the port via Blair Athol. A new line then runs adjacent to the existing QR rail corridor located south of Wotonga, to Newlands. The final approach to the port and rail loops would be on a greenfield track. The total distance from mine to port is 488 km.

The mine to Dudgeon Point rail corridor option includes three variations:

- Option 2B: This greenfield rail corridor includes 401 km of new track extending from the mine in a north-easterly direction before running adjacent to the existing rail corridor from Blair Athol to the Connors Range. A greenfield alignment would be followed through the Connors Range to the proposed coal terminal at Dudgeon Point.

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- Option 2H: This greenfield rail corridor includes 162 km of new track extending from the mine in a north-north easterly direction, north of the Blair Athol State Forest, before running adjacent to the existing rail corridor from north of Blair Athol to the Connors Range. A new rail spur line would head north-north west near the Connors Range to the proposed coal terminal at Dudgeon Point. The total distance from mine to port is 427 km.
  - Option 2J: This rail corridor includes 162 km of new railway extending from the mine in a north-north easterly direction, north of the Blair Athol State Forest, to connect to the QR line from north of Blair Athol to the Connors Range. This option would utilise an expanded QR infrastructure and rail corridor to the coast. A new rail spur line would head north-north west near the Connors Range to the proposed coal terminal at Dudgeon Point. Total distance is approximately 427 km.

It should be noted that the six rail options represent a refinement of the rail options originally presented in the initial advice statement (IAS) for the project, taking into account engineering and environmental constraints.

One of the six possible rail options will be selected and analysed in the EIS. The EIS will consider all impacts on environmental values from the selected rail corridor construction, operation and maintenance, including impacts of associated utilities and infrastructure.

Other alternative options will be discussed in the EIS, including reasons for selecting the preferred alternative

### **Port facilities**

Two potential port locations between Gladstone and Townsville are considered potentially feasible for the project. These options are Abbot Point and Dudgeon Point. The coal terminal and coal handling operations would be of a similar scale and nature irrespective of the final port location chosen (see Attachment 3). The port capacity would be designed for 60 Mtpa, with the potential to expand to 120 Mtpa. The initial capacity would be 30 Mtpa from the Alpha mine with the additional 30 Mtpa from other potential producers in the Galilee and Bowen basins.

Situated approximately 25 km north-west of Bowen, the Port of Abbot Point is an existing coal export port and is currently undergoing expansion and development. The port and surrounding land has extensive expansion planned and committed for the next five years to meet growing coal export demand and to facilitate the development of other industries. The coal terminal is likely to expand to over 100 Mtpa capacity, underwritten by take or pay contracts.

In addition to the current expansion, Abbot Point is able to accommodate a greenfield facility, entitled X230, which would allow an additional capacity of over 100 Mtpa. The proponent is examining X230 as one of its port options.

A further multi-purpose port concept is proposed by the Ports Corporation of Queensland (PCQ) for Abbot Point, in accordance with the Queensland Government's development goals identified in the *Northern Economic Triangle Infrastructure Plan 2007-2012* (NET Plan). The multi-purpose port concept supports the opportunity for industrial development of regional, state and national significance in the Abbot Point State Development Area (APSDA), adjacent to the port. Should PCQ have available capacity within the initial X110 mtpa of port capacity, Hancock would also consider this port development option.



Dudgeon Point is located approximately 5 km north-west of Hay Point, near the city of Mackay. The port site offers similar conditions to those pertaining to the adjacent Dalrymple Bay and Hay Point Coal terminals. Access to Dudgeon Point would be facilitated through a designated road and rail access established for the project. Dredging would be required for the berth, swing basin and approach area and departure channel via the Dalrymple Bay Coal Terminal area. A new rail access would be required down the Sarina Range to Dudgeon Point. Land surrounding Dudgeon Point is predominantly held in freehold or leasehold by PCQ. Approximately 1300 ha is under PCQ control of which 600 ha is considered 'developable'.

The conceptual layout and design of the port components and characteristics (including coal handling facility and coal terminal) at either Abbot Point or Dudgeon Point, may include, but are not limited to:

- unloading conveyors to transfer coal from the rail dump station to the stacker, which is placed into stockpiles on the stockyard using reclaimer machines
- stockpile capacity would initially function with 30 Mtpa throughput with adequate land for the potential expansion in stockpile capacity to 120 Mtpa
- outloading conveyors to transfer coal along the approach jetty; up to 4.7 km in length depending on the selected port location
- designed to accommodate a full range of vessels from Panamax size vessels to Chinamax size vessels
- a shiploader on the jetty to transfer coal to the ships. Provision for the expansion of the jetty and shiploaders would allow for additional future berthing capacity.
- substations, workshops, administration buildings, security, amenities and lighting and associated infrastructure for the coal terminal and rail yard would be constructed
- roadworks and bridges are expected to be required for terminal and rail yard access
- a suitable water supply would be required for each option and the specific solution for the successful site will be decided during the study phase.

One of the two possible port locations will be selected and analysed in the EIS. The EIS will consider all impacts on environmental values from the selected port construction, operation and maintenance, including impacts of associated utilities and infrastructure.

## 2. Project proponent

Hancock is a privately owned diversified Australian prospecting and mining company that has discovered mineral deposits throughout Australia, some of which have underpinned Western Australia's iron ore export industry. Founded by Lang Hancock more than 50 years ago, Hancock has a long history in the minerals exploration and development industries across Australia. The company has held coal tenements in Queensland for more than 30 years.

Contact details for Hancock are as follows:

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WA 6872

**Phone:** (08) 9429 8222

**Queensland Office:**

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GPO Box 963  
Brisbane  
QLD 4001

**Phone:** (07) 3231 9600



### 3. Legislative framework

On 18 September 2008, Hancock lodged an initial advice statement (IAS) for its proposed Alpha Coal project (the project) with the Queensland Coordinator-General to seek 'significant project' declaration under the *State Development and Public Works Organisation Act 1971* (SDPWOA). The IAS provides an outline of the proposed project, including the project rationale and its potential impacts in accordance with the requirements of s.27(1)(a) of the SDPWOA.

On 21 October 2008, the Coordinator-General declared that the project was a 'significant project for which an environmental impact statement (EIS) is required' pursuant to s.26(1)(a) of the SDPWOA. Matters considered by the Coordinator-General in making this declaration included information contained in the IAS, relevant planning schemes and policy frameworks, infrastructure impacts, employment opportunities, environmental effects, complexity of local, state and Commonwealth Government requirements, level of investment and the project's strategic significance.

The declaration initiates the statutory environmental impact assessment procedure under Part 4 of the SDPWOA which requires the proponent to prepare an EIS for the project.

On 21 November 2008, the proponent referred the project to the Commonwealth Government Minister for the Environment, Heritage and the Arts for a decision as to whether the project constitutes a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (referral No. 2008/4648).


On 13 January 2009, the Minister determined that the project constitutes a 'controlled action' as there is potential to impact on matters of 'national environmental significance' (MNES). The Controlling provisions being:

- sections 12 and 15A (world heritage properties)
- sections 15B and 15C (national heritage places)
- sections 18 and 18A (listed threatened species and communities)
- sections 20 and 20A (listed migratory species)
- sections 23 and 24A (Commonwealth marine areas).

The Minister has further determined that environmental assessment of MNES is to be undertaken in accordance with Part 8 of the EPBC Act to be administered by the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA).

Following consultation between the Queensland Department of Infrastructure and Planning (DIP) and DEWHA, it was agreed that the environmental impact assessments under the SDPWOA and EPBC Act be conducted in parallel, based upon one terms of reference (TOR) and one EIS study and report that would satisfy the requirements of both jurisdictions.

The first step in the impact assessment process was developing these TOR for an EIS for the project, as required under the SDPWOA. This involved developing draft TOR that was made available for public and advisory agency comment. When finalising these TOR the Coordinator-General considered all properly made submissions. These TOR were then presented to the proponent.



The proponent will prepare an EIS to address the TOR. Once the EIS has been prepared to the satisfaction of the Coordinator-General, a public notice will be advertised in relevant newspapers. The notice will state where copies of the EIS can be viewed or purchased, the submission period and where the submissions should be sent. The proponent may be required to prepare a supplementary report to the EIS to address specific comments submitted by advisory agencies and members of the public.

At the conclusion of the EIS phase, DEWHA will prepare a decision brief for the Commonwealth Minister for the Environment, Heritage and the Arts or his delegate, evaluating MNES addressed in the EIS. The draft of the proposed decision will be provided to Commonwealth and state ministers who were invited to comment at the project referral stage to provide any comment within 10 business days. The final decision of the Commonwealth minister will be publicly notified on the DEWHA website at: [www.environment.gov.au/epbc/](http://www.environment.gov.au/epbc/)

Also, after 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 s.35 of SDPWOA. The Coordinator-General's report will include an assessment and conclusion about the environmental effects of the project and any associated mitigation measures. Material that will be assessed includes the EIS, properly made submissions and other submissions accepted by the Coordinator-General and any other material the Coordinator-General thinks is relevant to the project such as a supplementary report to the EIS, comments and advice from advisory agencies, other entities, technical reports and legal advice.

The Coordinator-General's report will be publicly notified by placing it on the Department of Infrastructure and Planning website at [www.dip.qld.gov.au/eis](http://www.dip.qld.gov.au/eis). The Coordinator-General's report will also be presented to the proponent, the assessment manager/s (under the *Integrated Planning Act 1997* (IPA)), the Commonwealth Minister for Environment, Heritage and the Arts (under the EPBC Act), the Queensland minister administering the *Environmental Protection Act 1994* (EP Act) and the Queensland minister administering the *Mineral Resources Act 1989* (MRA).

The Coordinator-General's report may state conditions for:

- proposed mining lease(s) under the MRA
- any draft environmental authority under the EP Act for the proposed environmental authority (mining activities)
- a development approval under IPA

The Coordinator-General will assess and determine all applications for material change of use within the APSDA.

## 4. Results of consultation on these terms of reference

These TOR were developed from draft TOR that was made available for public and advisory agency comment. When finalising these TOR the Coordinator-General considered all submissions received.

Advertisements inviting public comment on the draft TOR for the project were placed in The Weekend Australian, The Courier-Mail, The Rockhampton Morning Bulletin, The Mackay Daily Mercury and The North West Star on 7 February 2009. A similar notice was placed on the DIP website.

The submission period closed on 9 March 2009. A total of 22 submissions were received, including 16 from advisory agencies, two from local government, three from private individuals and organisations, and one from a community group. Copies of submissions were provided to the proponent.

During the consultation process DEWHA recognised that the project may impact on Commonwealth marine areas, a further controlling provision under the EPBC Act. Consequently the bilateral agreement does not apply under s49(1) of the EPBC Act and a parallel assessment process will be conducted based on one TOR and one EIS Study and report that would satisfy the requirements of both jurisdictions.

The following is a list of submissions received on the draft TOR:

<b>No.</b>	<b>Agency/Individual/Area interest groups</b>	<b>Abbrev</b>	<b>Date</b>
1	Yarraboldy Briquettes Pty Ltd	Yarraboldy	13/02/09
2	Isaac Regional Council	IRC	04/03/09
3	Department of Emergency Services	DES	04/03/09
4	Department of Primary Industries and Fisheries	DPIF	05/03/09
5	Matt Mushalik	Mushalik	09/03/09
6	Ports Corporation of Queensland	PCQ	09/03/09
7	Central Highlands Regional Council	CHRC	09/03/09
8	Queensland Transport	QT	09/03/09
9	Disability Services Queensland	DSQ	09/03/09
10	Mackay Conservation Group	MCG	09/03/09
11	Environmental Protection Agency	EPA	09/03/09
12	Department of Mines and Energy	DME	09/03/09
13	Department of Natural Resources and Water	DNRW	09/03/09
14	Department of Housing	Housing	10/03/09
15	Department of Main Roads	DMR	10/03/09
16	Department of Communities	Communities	10/03/09
17	Department of Tourism, Regional Development and Industry	DTRDI	11/03/09
18	Department of Employment and Industrial Relations	DEIR	12/03/09
19	Department of Infrastructure and Planning – Planning Group	DIP-Planning	12/03/09
20	Queensland Police Service	QPS	13/03/09
21	Queensland Health	Health	18/03/09
22	AustralAsian Resource Consultants	AARC	13/03/09

## 5. EIS objectives

The objective of the EIS is to ensure that all potential environmental, social and economic impacts of the project are identified and assessed and, where possible, how any adverse impacts would be avoided or mitigated. If project impacts cannot be avoided or mitigated, offsets should be proposed in accordance with the *Queensland Government Environmental Offsets Policy 2008* and specific issue offsets policies requirements. 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 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 avoid, mitigate and/or offset adverse impacts. The EIS document should provide information for the following persons and groups, as the project 'stakeholders':


- *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 adverse impacts
- *Groups or persons with rights or interests in land (as defined under section 38 of the EP Act:* an outline of the effects of the proposed project on that land including access arrangements
- *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
- *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, to mitigate the effects of adverse environmental impacts of the development.

The proponent is required to address the TOR to the satisfaction of the Coordinator-General and DEWHA before the EIS is made publicly available. It should be noted that the evaluation of the EIS is not undertaken until public notification is completed and all relevant material, including additional information or comment about the EIS and the project is available. Completion of the EIS in accordance with the final TOR does not mean the project will be approved.

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

## 6. General EIS guidelines

The EIS is to provide stakeholders with sufficient information to understand the type and nature of the project, the potential environmental, social and economic impacts, and the measures proposed by the proponent to mitigate all adverse impacts on the natural, social and economic environment. It should be recognised that Commonwealth, Queensland and local governments, special interest groups and the general public will have an interest in the EIS.




All phases of the project should be described in the EIS including pre-construction, construction, operation and decommissioning, including final rehabilitation of the mine site and any redundant infrastructure. Direct, indirect and cumulative impacts should be identified and assessed with respect to environmental values and potential extent of impacts. Cumulative impacts include local and regional impacts accumulating over time and impacts exacerbated by intensity or scale or frequency or duration of impacts, either in isolation or by combination with other known existing or planned impacts, both at project sites and areas remote from these.

Specifically, the EIS should provide:

- an executive summary of the potential environmental impacts of the project
- an overview of the proponent and its existing operations
- a description of the project's objectives and rationale, as well as its relationships to strategic policies and plans
- a description of the entire project, including associated infrastructure requirements
- a description of feasible alternatives capable of substantially meeting the proposal's objectives
- an outline of the various approvals required for the project to proceed
- descriptions of the existing environment, particularly where this is relevant to the assessment of impacts
- measures for avoiding, minimising, managing and monitoring adverse impacts, including a statement of commitment to implement the measures
- environmental, economic and social offsets to offset unavoidable project impacts that cannot otherwise be avoided, managed or mitigated
- rigorous assessment of the risks of adverse and beneficial environmental impacts arising from the project and relevant alternatives on environmental, social and economic values, relative to a 'no project' scenario
- any information derived from baseline and predictive studies, the required extent of which will be commensurate to risks
- a description of stakeholder consultation undertaken
- responses to issues raised during public and stakeholder consultation.

The main EIS report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the approach to be adopted requires that:

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



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

Specific types of relevant impacts requiring investigation are set out in Part B. However, these TOR are not intended to be exhaustive and the EIS will need to address other issues or aspects that may emerge during the investigations and preparation of the EIS. Ultimately, it is the proponent's responsibility to identify all the relevant matters to be addressed and to ensure that adequate studies are undertaken and reported.

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

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

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

The EIS should also contain an indexed guide to the content of the EIS to allow readers to readily identify information of interest.

The term 'detail' and 'discuss' should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate. Should 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.


## 7. Stakeholder consultation

The proponent should undertake a comprehensive and inclusive program of consultation with the stakeholders identified in Section 5 EIS objectives (above). The consultation program should provide stakeholders with the opportunity to obtain information about the project, to raise issues and express their concerns and to receive feedback on how the proponent intends to address the issues and mitigate all adverse impacts of the project.

Consultation with the advisory agencies should be the principal forum for identifying legislation, regulations, policies and guidelines relevant to the project and EIS process.

Where appropriate, information bulletins can be used to disseminate information to a wider audience. These bulletins can also be used to inform stakeholders of the proponent's progress in the EIS process and on specific investigations.

The proponent is encouraged to provide opportunities for the general public to obtain information about, and comment on, the project through public information sessions. Where appropriate, information bulletins can be used to disseminate information to a wider audience. These bulletins can also be used to inform stakeholders of the proponent's progress in the EIS process and on specific investigations.



As part of this EIS process, consultation should also be undertaken to better understand the social impacts of the proposed project and opportunities for mitigation of those impacts (refer to Part B – Section 1.5 Socio-economic costs and benefits of the project).

## 8. EIS format and copy numbers

The EIS should generally be presented in a format consistent with that outlined in Part B. There should be clear demarcation between material in the EIS that refers to the separate project components (mine site, rail corridor, and port facility) to allow assessment managers, advisory agencies and other readers to differentiate between the project components.

The documentation is to include appendices containing:

- a copy of the TOR
- a cross reference between the TOR and relevant sections of the EIS
- a list of development approvals required for the project
- an explanation as to how the EIS satisfies the standard criteria
- copies of specialist studies performed as part of the EIS
- any proposals for researching alternative environmental management strategies or for obtaining any further necessary information
- a list of persons, interest groups and agencies consulted during the EIS
- a list of advisory agencies consulted with an appropriate contact
- the names of, and work done by, all personnel involved in the preparation of the EIS
- a list of all commitments made by the proponent in the EIS
- a copy of the proponent's corporate environment policy.

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

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

Two separate CD-ROM/DVD copies should be provided:

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

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

## 9. Further information

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

EIS Project Manager – Alpha Coal project  
Significant Projects Coordination  
Department of **Infrastructure and Planning**  
PO Box 15009  
Brisbane City East QLD 4002  
**tel** +61 07 3238 3131  
**fax** +61 07 3225 8282  
[alphacoal@dip.qld.gov.au](mailto:alphacoal@dip.qld.gov.au)

[www.dip.qld.gov.au](http://www.dip.qld.gov.au)

or

Assessment Officer – Alpha Coal project  
Mining Section  
Department of the **Environment, Water, Heritage and the Arts**  
GPO Box 787  
Canberra ACT 2601

[www.environment.gov.au](http://www.environment.gov.au)



## Part B — specific requirements and structure of the EIS

It is preferred that the EIS generally follows the format and content outlined in this Part of the TOR. If this is not possible, guidelines describing how the EIS responds to the TOR should be included in the appendices.

### Executive summary

The function of the executive summary is to convey the most important aspects and options relating to the project to the reader in a concise and readable form. It should use plain English and avoid the use of jargon and esoteric terms. The executive summary should be written as a stand alone document, able to be reproduced on request and distributed to interested parties who may not wish to read or purchase the EIS as a whole.

The structure of the executive summary should follow that of the EIS and focus strongly on the key issues to enable the reader to obtain a clear understanding of the project and its potential adverse and beneficial environmental, social and economic impacts. It should outline the management measures to be implemented by the proponent to mitigate all residual impacts.

The executive summary should include:

- the title of the project
- name and contact details of the proponent, and an outline of previous projects undertaken by the proponent 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
- a description of alternative options considered and reasons for the selection of the proposed development option
- a brief description of the project (pre-construction, construction and operational activities) and the existing environment, using visual aids where appropriate
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts
- detailed maps of the proposed project location.

### Glossary of terms

A glossary of technical terms, acronyms and abbreviations used in the EIS should be provided.

# 1 Introduction

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

## 1.1 Project proponent

This section should describe the experience of the project proponent, 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

This section should provide a brief description of the key elements of the project including the mine site, rail corridor and port facility, as well as associated infrastructure requirements. The location of the project and its infrastructure requirements should be described and mapped. Detailed descriptions of the project should follow in Section 2 Description of the project.

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

## 1.3 Project rationale

This section should provide a statement of the objectives of the project and a brief outline of the events leading up to the project's formulation, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

This section should summarise the rationale for the project in a local, regional, state and national context:

- expected local, regional, state or national benefits
- strategic, economic, environmental and social implications
- the project's technical feasibility and commercial viability
- the rationale and justification for the project in relation to any relevant published policy or regulatory framework.

This discussion should examine the infrastructure needs of the state and Central Queensland economies and the project's role in supporting state development and environmental policies and strategies.

The interdependencies of the various project components should be explained, together with any infrastructure requirements that may affect the viability of the project. Should water supply, power, transport and/or storage infrastructure be included as an element of the project, this section should include a description of, and rationale for, such additional infrastructure.

## 1.4 Relationship to other projects

This section should describe how the project relates to any other projects, of which the proponent should reasonably be aware, that have been or are being undertaken or that have been approved in the area affected by the project. In particular, mention should be made of any modifications needed or interaction between any existing facilities/infrastructure and any interdependency between these projects and the Alpha Coal project.

In particular, this section should refer to the relationship between the project and coal mining/export projects planned for the Galilee Basin and selected port option undergoing separate assessments and to existing coal mining and export activities operated by the proponent or other companies.

Consequential impacts as defined under the EPBC Act, and projects which will be considered as part of cumulative impact assessment (Section 7) should be identified and their relevance discussed.

## 1.5 Socio-economic cost and benefits of the project

Section 4 deals with social values, impacts and their management and Section 5 deals with economic impacts and their management. This section should summarise the short and long-term:

- economic costs and benefits of the project to businesses and the wider community, including direct and indirect employment and local business involvement
- direct social costs and benefits, including community disruption, related land use changes, employment, skills development and any workforce accommodation issues
- any increased demand for natural resources as a result of the project
- increased demands on local and regional community services and facilities.

## 1.6 Alternatives to the project


This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Where relevant, comparative environmental impacts of each alternative should be summarised.

The reasons for selecting the preferred options should be outlined and include technical, commercial, social and environmental aspects where relevant. In particular, the principles of environmentally sustainable development (ESD) should be examined.

Alternatives to the project should include sufficient detail on the non-preferred options of infrastructure to enable an evaluation of the reasons for selecting the chosen option.

With respect to associated linear infrastructure, including the railway, water supply pipeline and energy infrastructure, discussion of reasonably practicable alternatives should include:

- alternative routes considered, aided by maps and diagrams. The route options highlighting the preferred route, shown on topographical maps at a suitable scale
- the rationale for selecting the preferred corridor and reasons for rejecting other options

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- a comparative description of the impacts of each alternative for the project on matters of state and national environmental significance
  - a discussion on the alternative routes considered in relation to their ability to complement and strengthen the state's infrastructure.

## 1.7 Co-location opportunities

Opportunities may exist for efficiency gains and the mitigation of environmental and property impacts through the co-location of proposed linear infrastructure project elements within existing or other proposed linear infrastructure (such as rail corridors, gas pipelines and electricity transmission and distribution easements). There may also be opportunities to co-locate proposed linear infrastructure from third parties in, near or parallel to the proposed linear infrastructure project elements.

The proponent should identify any third party proposals to develop infrastructure within the vicinity of project investigation corridors. 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.

It would be the responsibility of any such third parties to provide the required information to the proponent. DIP can, at the proponent's request, assist with the facilitation of meetings with known proponents of other linear infrastructure in the project area.

It would be inappropriate for this EIS to evaluate the environmental impacts of other infrastructure not directly required for this project. However the EIS should describe the implications of locating other forms of linear infrastructure within or near proposed project corridors. Where co-location may be likely, the EIS should consider opportunities to coordinate or enhance any of the impact mitigation strategies proposed for the project through cooperation with other proponents in the locality. In particular, the potential implications of any infrastructure co-location on corridor widths and alignment should be described.

## 1.8 The environmental impact assessment process


This section should provide an outline of the approvals process, including the environmental impact assessment process and any associated licence or permit application processes. It should include information on the relevant stages of the approvals process, statutory and public consultation requirements and any interdependencies that exist between the approvals sought.

This section should also make clear the objectives of the EIS process under the SDPWOA and development approval under IPA and EP Act and the NET Plan in accordance with the SDPWOA. In addition, the issuing of environmental authorities, the mining lease and approvals under the IPA, MRA, EP Act and the development scheme for the APSDA (if applicable) should be addressed.

### 1.8.1 Methodology of the EIS

This section should outline the stages of the EIS process under the SDPWOA including information on the relevant stages of the approvals process; Commonwealth referrals statutory and public consultation requirements any associated licence or permit application processes and any interdependencies that exist between approvals (Details of specific approvals should be presented under Section 1.10 Project approvals). The information in this section is required to ensure:

- stakeholders are informed of the EIS process to be followed

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- stakeholders understand the relationships between the EIS and other associated approvals
  - stakeholders are aware of any opportunities for input and participation
  - relevant legislation is addressed.

### 1.8.2 Objectives of the EIS

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

- provide public information on the need for and likely effects of the project on the natural, social and economic environment
- set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values
- demonstrate the relationship of environmental management, planning documentation, conditions, approvals and environmental authorities to the project
- demonstrate how unavoidable environmental impacts can be managed and/or offset through the protection and enhancement of the environmental values.

The role of the EIS in providing information for the formulation of an environmental management plan (EM plan) for the project should be discussed. Discussion of options and alternatives is a key aspect of the EIS.

### 1.8.3 Submissions

The reader should be informed as to how and when public submissions on the EIS will be addressed and taken into account in the environmental assessment and decision-making processes. The EIS should inform the reader on how to make submissions, what form the submissions should take and when submissions should be made.


## 1.9 Public consultation process

An appropriate public consultation program is an important component of the EIS process. The public consultation program should provide opportunities for community involvement and education. It may include interviews with individuals, public communication activities, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local and regional communities and interest groups and address issues from project planning through construction, commissioning, project operations and final decommissioning.

The key objectives of the consultation program should be to:

- inform the different interest groups about the project proposal
- seek an understanding of interest group concerns about the project
- explain the impact assessment research methodology and how public input might influence the final recommendations for the project
- provide an understanding of the regulatory approval process
- seek local information and input into the project.



A consultation plan should be prepared during the initial phase of the EIS process. This should identify:

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

Any Indigenous component of the public consultation program should be guided by engagement that:

- is geographically specific
- uses appropriate language and media
- takes into account the communication skill level of participants.

This section should outline the methodology adopted to:

- identify stakeholders and how their involvement was facilitated
- identify the process conducted to date and future consultation strategies and programs, including 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.

Detailed results of the consultation process should be provided as a consultation report and presented as an appendix to the EIS. A summary of the key processes and outcomes should be provided in this section.

## 1.10 Project approvals

### 1.10.1 Relevant legislation and policy requirements

This section should identify and explain applicable legislation and policies controlling the assessment and decision-making processes and should identify all the approvals, permits and licences that will need to be obtained for the development for the proposed project to proceed.

The EIS should describe the assessment process resulting from the gazettal of the project as a significant project pursuant to the SDPWOA and outline the linkage to other relevant state and Commonwealth legislation. This outline should describe the public notification processes and appeal rights that will be available in the anticipated assessment and decision processes. The EIS should indicate the level of information required for each project element in order that decision-making agencies are able to determine the completeness of the information presented and the scope to make their decisions.

Key pieces of legislation that will need to be addressed in terms of implications for project approval include but are not limited to:

#### Commonwealth Government

*Environment Protection and Biodiversity Conservation Act 1999*

*Environment Protection (Sea Dumping) Act 1981*

*Great Barrier Reef Marine Park Act 1975*

*Native Title Act 1993*

*Civil Aviation Regulations 1988 and Civil Aviation Safety Regulations 1988*

#### Queensland Government

*State Development and Public Works Organisation Act 1971*

*Environmental Protection Act 1994*

*Mineral Resources Act 1989*

*Integrated Planning Act 1997*

*Aboriginal Cultural Heritage Act 2003*

*Coastal Protection and Management Act 1995*

*Fisheries Act 1994*

*Land Act 1994*

*Land Protection (Pest and Stock Route Management) Act 2002*

*Nature Conservation Act 1992*

*Queensland Heritage Act 1992*

*Transport Infrastructure Act 1994*

*Transport Operations (Marine Pollution) Act 1995*

*Vegetation Management Act 1999*

*Water Act 2000*

*Building Act 1975*

*Marine Parks Act 2004*

*Wild Rivers Act 2005*

Local government planning controls, local laws and policies applying to the project should be described, and a list provided of the approvals required for the project (including those related to the conduct of prescribed environmentally relevant activities) and the expected program for assessment of applications.

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

### **1.10.2 Planning processes and standards**

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

- Any planning controls, by-laws and policies relating to the study area/s and adjacent lands
- Details of all licences, planning and environmental approvals required or previously granted
- Regional strategies or plans that relate to the study area/s or the project (existing or in preparation)
- Relationship to other significant developments (existing or proposed) in the study area/s or surrounding areas (where details of such proposed developments are provided by DIP to the proponent or otherwise published).

This should include an assessment of the project's consistency with the Development Scheme for the APSDA (if appropriate), Ports Corporation Queensland's Land Use Plans, as well as the Bowen Shire Planning Scheme as regulated by the Whitsunday Regional Council and other relevant local authority planning schemes.

This information is required to demonstrate how the proposal conforms to state, regional and local plans for the area.

In preparing the EIS, the proponent should make reference to the *Natural Resource Management (NRM) Plan* accredited by the Queensland and Commonwealth governments under the *National Action Plan for Salinity and Water Quality* and the Natural Heritage Trust for the respective catchments, where activities are planned, such as the Galilee Basin (CQSSII 2004, FBA). It is recommended that the proponent consults with the regional NRM bodies that would have a broad range of NRM interests in the project component areas. Reference should also be made to the appropriate regional planning frameworks, such as the 'Central Queensland – A New Millennium' and 'Whitsunday, Hinterland and Mackay Regional Plan'.

### 1.10.3 Accredited process for controlled actions under legislation

The project is a controlled action under the Commonwealth Government's EPBC Act and a significant project under the SDPWOA. The EIS will be developed pursuant to the parallel assessment process between the Commonwealth and Queensland governments for the purposes of the Commonwealth Government's assessment under Part 8 of the EPBC Act.

The EIS should address potential impacts on the MNES that were identified in the controlling provisions when the project was determined to be a controlled action.

A stand-alone report should be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. It should comply with the following outline:

- introduction
- description of proposed action (as it would impact on MNES)
- description of the affected environment relevant to the controlling provisions (i.e. describe features of the environment that are MNES, protected under the EPBC Act)
- assessment of impacts on MNES and mitigation measures (in accordance with available guidelines and species recovery plans)
- consideration of any potential offsets to ameliorate residual impacts
- conclusions
- references.



## 2 Description of the project

The objective of this section is to describe the project (mine, railway, port, etc) through its lifetime of construction and operation and decommissioning (including rehabilitation). This information is required to allow assessment of all aspects of the project, including which approvals may be required and how they may be managed through the life of the project.

The information provided in this section should be in accordance with relevant legislation, standards, codes and/or guidelines.

### 2.1 Overview of project

The EIS should provide an overview of the project. This section should include but is not limited to:

- a description of the key components of the project, including the interrelationships between the elements of the project and between the components of the project and other projects in the area
- the expected cost, overall duration and timing of the project
- a summary of any environmental design features of the project
- the employment benefits from the construction and operational phases of the project.

Text and design plans should be used where applicable.

### 2.2 Location

This section should describe the regional and local context of each element of the project and associated infrastructure, illustrated on maps at suitable scales. Real property descriptions of project sites should be provided. Maps should show the precise location of project areas but should not be limited to the following:

- the location of the rail corridor, port and resource to be explored, developed or mined
- the location and boundaries of land tenures, in place or proposed, to which the project is or will be subject
- the location and boundaries of the project footprint showing all key aspects including excavations, stockpiles, areas of fill, watercourses, plant locations, water storages, buildings, bridges, culverts, hardstands, car parks, etc
- any part of the resource(s) not intended to be mined and any part of the resource(s) that may be sterilised by the proposed mining operations
- the location of any proposed buffers surrounding working areas
- the location of all proposed project transport (rail) and coal loading infrastructure for both new works and infrastructure, including the various coal transport options considered with an explanation for the rationale for the preferred transport option(s) for the project
- the location of any proposed buffers surrounding the working areas
- the locations of any proposed accommodation sites
- the identification of all site access points to, from and within the project on maps to assist in the assessment of emergency planning
- the location and boundaries of the site offices for the project

- the location and boundaries of the project footprint, including easement widths and access requirements
- the location and boundaries of the port and associated facilities
- the location, or alternative locations, or the proposed aerodrome and associated infrastructure
- illustrate the total area of land and vegetation to be disturbed, providing measurements of those areas
- illustrate areas of endangered ecological communities and other environmentally sensitive areas to be disturbed, providing measurements of those areas.

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

## 2.3 Construction

Proposed pre-construction activities should be described for each element of the project (mine, railway, port, etc). This section should set out:

- up-grade, relocation, realignment or deviation of roads and other infrastructure
- extent of vegetation clearing and its disposal. This information should indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas, waterway crossings and tidal lands), and should also reference where in the EIS the impacts on such vegetation have been addressed.
- disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity
- any land acquisitions required, be it in full or as easements, leases, etc
- an assessment of expected physical and chemical properties and quantities of soil/rock to be excavated
- details of any potential disruption to flows of waterways during construction and any diversion works required
- site establishment requirements for construction facilities including provision of site access, power, telecommunications, water supply and other infrastructure.

The extent and nature of the project's construction phase should be described, including any staging of the project with illustrations showing site boundaries, development sequencing and timeframes. For all the components of the project, the general description should include but should not be limited to the following:

- the design, construction standards, construction methods and site management, including the containment and/or disposal of construction spoil
- works needed within project sites and off-site (e.g. erosion protection)
- general construction requirements including supply and storage of materials, types, sources, quantity and method of transport of construction materials
- the number and type of vehicles, machinery and equipment used for construction activities
- chemicals and hazardous goods to be utilised (if any)
- timetable for the construction phase, including hours of construction particularly noting seasonal rainfall or flows
- licensing/permit requirements for the construction works

- general construction standards and site management including public safety and emergency aid/medical facilities to be provided on site and environmental management
- allowance for provision of power back-up in an emergency and potential impact on local supplies in the area
- cleanup and restoration (rehabilitation) of areas used during construction including any accommodation facilities and storage areas
- crossing techniques including restoration works that would be used at creek crossings, and road, rail, and other service corridor crossings
- security.

## 2.4 Project operations

The location and nature of the processes to be used for each element of the project should be described in the text and illustrated with maps, diagrams and artist's impressions as required.

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

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

### 2.4.1 Mine

#### 2.4.1.1 Coal resource base and mine life

Specific details should be provided on the following:

- an outline of the coal/mineral resource base (further detail should be provided in Section 3.2.2 Geology) and the proposed mine life
- the quantity of coal/mineral to be mined annually including any proposed ramping of production or staging of development.

#### 2.4.1.2 Mining methods and equipment

Specific details should be provided on the following:

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

The description should refer to, and be complemented by, the figures previously presented in Section 2.2 Location, showing the locations of key aspects of the project. Additional figures should be provided if required.

### 2.4.1.3 Mine sequencing

Specific details should be provided on the following:

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

### 2.4.1.4 Processing and products

This section should describe the quantities and characteristics of the products produced on an annual basis. Indicative process flow-sheets should be provided showing material balances for the processing plant and the anticipated rates of inputs, along with similar data on products, wastes and recycle streams. The proposed coal handling methods and facilities to be used for coal product storage and transfer to the rail load-out facility should be described including:

- description of key plant and equipment, processes and capacities
- indicative material balances for the processing plant, and the anticipated rates of inputs along with similar data on products and tailings streams
- data on any chemicals to be used
- location of proposed tailings disposal areas
- description of the types, quantities and characteristics of the products produced
- coal handling methods and facilities.

### 2.4.1.5 Ongoing evaluation and exploration activities

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

## 2.4.2 Railway

### 2.4.2.1 Railway description

Information should be provided that illustrates the location and characteristics of the proposed railway easement. Such information should include details in respect of railway gauges, easement widths, passing loops, train concepts, maximum tonnages and grades, bridges, and signalling. The potential for the future electrification of the line should be discussed.

The location of supporting facilities such as maintenance depots, communication installations, fuel storage, water supply and the like should be identified and their operation described.

### 2.4.2.2 Analysis of freight demand

This section should outline an analysis of freight demand and logistics during operations. This should include descriptions of operating characteristics of the line and expected train movements, including initial traffic and growth scenarios and ultimate capacity expectations.

The location and nature of potential third party use of the line should be described. In particular, the connecting rail infrastructure and/or rail loadout facilities should be identified.

It should also summarise any operational practices and design features intended to help manage any environmental impacts likely to arise from the railway's operation. A full description of impacts and their management measures should be provided in Sections 3 & 4 of the EIS.

### 2.4.3 Port

#### 2.4.3.1 Port description

Concept and layout plans should be provided highlighting proposed structures, plant and equipment associated with terminal operations. The description of the port and the layout of key components should include but is not limited to:

- port boundaries
- details of area to be dredged and dredged spoil disposal areas
- details of capital and maintenance dredging equipment and methods
- jetty and wharf alignment
- ship loading equipment
- berths for tugs and other non-bulk carrier vessels
- offshore ship mooring locations
- any other associated facilities.

The location and nature of the processes and operations associated with the long-term operation of the port should be described including:

- a general description of the operations of the coal terminal
- the capacity of stockpiling, in-loading and out-loading operations for each stage of the port's development
- the expected shipping frequency and intensity
- number of additional tugs, location of tug berths and tug operations
- hours of operation
- expected access, navigational and anchorage arrangements
- maintenance dredging operations
- long-term dredge spoil disposal strategy
- environmental management measures incorporated in the operation of the port.

### 2.4.3.2 Product handling

The proposed methods and facilities to be used for coal storage and blending and for transferring product from rail unloading to stockpile and to ship should be described and shown on plans at an appropriate scale. A summary of any environmental design features of the new facilities should be provided. The nature, sources, location and quantities of all materials to be handled, including storage and stockpiling of coal should be described.

## 2.5 Associated Infrastructure

This section should detail requirements for new infrastructure or the upgrade/relocation of existing infrastructure to service each element of the project. Matters to be considered include workforce and accommodation, transport, water supply and storage, stormwater drainage, sewerage, energy and telecommunications.

### 2.5.1 Workforce and accommodation

This section should provide a general overview of the number of personnel to be employed, the skills base of the required workforce and likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each component of the project. Proposed workforce accommodation should also be outlined.

Further details along with workforce recruitment and accommodation impacts should be addressed in Section 4.1.5 Profile of the workforce.

### 2.5.2 Transport

Describe arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction and operational phases of the project. The description should address the use of existing local and regional facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure (e.g. road, rail, ports airstrips, etc.).

Full details of transport volumes, modes and routes should be provided in accordance with Section 3.9 Transport.

### 2.5.3 Water supply and storage

The EIS should provide information on water usage by the project, including the quality and quantity of all water supplied to project sites. In particular, the proposed and optional sources of water supply should be described (e.g. bores, any surface storages, municipal water supply pipelines, coal seam gas water). If infrastructure is required for the purpose of supplying water to the project, for example, pipelines from water supplies to the project, then the impacts of such infrastructure are to be assessed as part of the project and discussed for each of the relevant 'Environmental values and management of impacts' subsections outlined in section 3 of these TOR.

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

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

## 2.5.4 Stormwater drainage

A description should be provided of the existing and proposed stormwater drainage system and the proposed disposal and/or re-use arrangements, including any off-site services and downstream impacts. Each element of the project needs to be addressed (e.g. mine, beneficiation and product handling) Further details should be provided in Section 3.4 Water resources.

## 2.5.5 Sewerage

This section should describe in general terms, the existing and proposed sewerage infrastructure required to service each project component. Volume estimates of existing and likely industrial and domestic effluent that will be produced should be provided and the proposed method of disposal identified. This should include the expected physical and chemical characteristics of such effluent.

## 2.5.6 Energy

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

## 2.5.7 Telecommunications

The EIS should describe the telecommunications proposed for the project and any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc). Infrastructure owners need to be identified.


# 2.6 Decommissioning and rehabilitation

This section should describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by each element of the project. A preferred rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The final topography of project areas should be shown on maps at a suitable scale.

The strategies and methods presented for progressive and final rehabilitation of disturbed areas should demonstrate compliance with the rehabilitation goals and objectives of the EPA guideline – *Guideline 18: Rehabilitation requirements for mining projects in relation to intergenerational equity, polluter pays principle, protection of biodiversity and maintenance of essential ecological processes*. Land suitability assessment should follow the *Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland, 1995*. In particular, the strategies and methods for progressive and final rehabilitation should, as a minimum, have the following goals:

- safe to humans and wildlife
- non-polluting
- stable
- able to sustain an agreed post-mining land use.

Additional site specific goals should be tailored to address site specific issues.



The means of decommissioning the project in terms of the removal of plant, equipment, structures and buildings should be described, and the methods proposed for the stabilisation of the affected areas should be outlined. Information should be provided regarding decommissioning and rehabilitation of the plant site, removal of processing plant, rehabilitation of concrete footings and foundations, hardstand areas, storage tanks and wharfage (including any potential for reuse of these facilities). Options and methods for the disposal of wastes from the demolition of plant and buildings should be discussed in sufficient detail for their feasibility and suitability to be established. Details should be provided on structures which are off lease and/or not on the mine site and infrastructure which is not intended to be decommissioned.

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

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

Details of the impacts of the preferred rehabilitation strategy should be discussed in the appropriate subsections of Section 3, particularly with regard to such issues as final landform stability, rehabilitation of flora and the long-term quality of water in any final voids. Implications for the long-term use and fate of the site should also be addressed, particularly with regard to the on-site disposal of waste and the site's inclusion on the Environmental Management Register (EMR) or Contaminated Land Register (CLR).

Reference should also be made to infrastructure that is not intended to be decommissioned. Where this is the case, the likely entity to which the infrastructure is intended to be transferred should be discussed together with the proposed environmental management regimes.



### 3 Environmental values and management of impacts

The functions of this section of the EIS are to:

- describe the existing environmental values of the area which may be affected by the project. Environmental values should be described by reference to background information and studies which should be included as appendices to the EIS.
- describe the potential adverse and beneficial impacts of the project on the identified environmental values. Any likely environmental harm to the environmental values should be described.
- describe any cumulative impacts on environmental values caused by the project, either in isolation or by combination with other known existing or planned sources of impact
- present environmental protection objectives and the standards and measurable indicators to be achieved
- examine viable alternative strategies for managing impacts. These alternatives should be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed.
- describe any likely residual environmental harm on environmental values, why it cannot be avoided and discuss potential offsets in accordance with Queensland Government specific-issue offsets policies. Offsets must be discussed with regard to impacts on EPBC Act matters, reference should be made to the eight principals set out in the DEWHA's Draft *Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999* or the finalised policy if available when the EIS is produced and its accompanying Discussion Paper in August 2007.


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

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

It is recommended that the EIS follow the heading structure shown below, separately analysing the project components of mine, rail and port. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the environmental management plan (EM plan) for the project (see Section 8 Environmental management plan).

#### 3.1 Climate and climate change

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect management of the project, including air quality within the region.



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

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed in Section 3.2 Land. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management and tailings dams) should be addressed in Section 3.8 Waste. The impacts of wind, rain, humidity and temperature inversions on air quality should be addressed in Section 3.6 Air quality.

Climate change, through alterations to weather patterns and rising sea level, has the potential to impact in the future on developments designed now. Most developments involve the transfer to, or use by, a proponent of a community resource in one form or another, such as the granting of a non-renewable resource or the approval to discharge pollutants to air, water or land. Therefore it is important that the project design be adaptive to climate change so that community resources are not depreciated by projects that could be abandoned or require costly modification before their potential to provide a full return to the community is realised. Consequently, the EIS should provide an assessment of the project's vulnerabilities to climate change and describe possible adaptation strategies for the activity including:

- a risk assessment to the project from climate change impacts including how changing patterns of rainfall and hydrology, temperature, extreme weather and sea level (where appropriate) 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.

It is recognised that predictions of climate change and its effects have inherent uncertainties, and that a balance must be found between the costs of preparing for climate change and the uncertainty of outcomes. Proponents should use their best efforts to incorporate adaptation to climate change in their EIS and project design.


## 3.2 Land

This section describes the existing environment values of land areas that may be affected by the project. It should also define and describe the objectives and practical measures for protecting or enhancing land-based environmental values, how nominated quantitative standards and indicators may be achieved and how the achievement of the objectives would be monitored, audited and managed.

### 3.2.1 Geology

#### 3.2.1.1 Description of environmental values

The EIS should provide a description, map and a series of cross-sections of the geology of the project areas, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Geological properties of all project sites which may influence stability, occupational health and safety, rehabilitation programs or the quality of waste water leaving any area disturbed by the project should be described.



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

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

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

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

### **3.2.1.2 Potential impacts and mitigation measures**

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


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

## **3.2.2 Soils**

### **3.2.2.1 Description of environmental values**

A soil survey of sites affected by the project should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity. Information should also be provided on soil stability, suitability for construction of proposed facilities and any approved soil conservation plans.

Soil profiles should be mapped at a suitable scale and described according to the *Australian Soil and Land Survey Field Handbook (McDonald et al, 1990)* and *Australian Soil Classification (Isbell, 2002)*. An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the *Planning Guidelines: the Identification of Good Quality Agricultural Land (DPI & DHLGP, 1993)*, and the *State Planning Policy 1/92: Development and the Conservation of Agricultural Land (DME, 1995)*.



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

An acid sulfate soil investigation, carried out according to the guidelines of the Acid Sulfate Soils Management Advisory Committee (ASSMAC), should be undertaken for relevant areas. The State Planning Policy 2/02: *Planning and Management of Development involving Acid Sulfate Soils* should also be addressed (e.g. identification and management of ASS and PASS and format of EM plans).

### **3.2.2.2 Potential impacts and mitigation measures**

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

The EIS should include an assessment of likely erosion effects for all disturbed areas such as:

- areas cleared of vegetation
- waste dumps
- stockpiles
- dams, banks and waterway crossings
- the port area and surrounding buildings
- the mine site, including buildings
- access roads, railway areas and associated infrastructure corridors
- areas under rehabilitation.

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


Consideration should be given to the amendment or revocation of any approved soil conservation plans as a result of project activities.

## **3.2.3 Land use and tenure**

### **3.2.3.1 Description of environmental values**

The EIS should provide a description of current land tenures and current land uses over all project areas, with particular mention of land with special purposes. The description should include any project areas that are subject to native title, either under claim or determined.

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, covering the affected land should be shown on maps at a suitable scale. Locations of gas and water pipelines, power lines and other infrastructure should be shown.



Maps at suitable scales showing existing land uses, tenures and infrastructure such as roads, railways, stock routes, pipelines, electricity and the like, should be provided at the project component locations, as well as the surrounding land that could be affected by the development. The maps should identify areas of conservation value and marine areas in any locality that may be impacted by the project. The location of existing dwellings and the zoning of all affected lands according to any existing town or strategic plan, or port land use plan should be included.

The land use suitability of the affected area in terms of the physical and economic attributes should be described. The assessment should set out soil and landform subclasses assigned to soil mapping units in order to derive land suitability classes. The limitations and land suitability classification system should comply with that in Attachment 2 of *Land Suitability Assessment Techniques in the Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland (1995)*.

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

### **3.2.3.2 Potential impacts and mitigation measures**

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

The potential environmental harm caused by the project on the adjacent areas currently used for agriculture, urban development, recreation, tourism or other business and the implications of the project for future developments in the impact area including constraints on surrounding land uses, should be described. If the development adjoins or potentially impacts on Good Quality Agricultural Land, then an assessment of the potential for land use conflict is required. Investigations should follow the procedures set out in the planning guideline, *The Identification of Good Quality Agricultural Land*, which supports State Planning Policy 1/92.


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

## **3.2.4 Topography and landscape character**

### **3.2.4.1 Description of environmental values**

Maps based on latitudes and longitudes using the Geocentric Datum of Australia (GDA94) should be provided locating the project in both regional and local contexts. Topography of the project site should be detailed with contours at suitable increments at Australian Height Datum. Commentary on the maps should be provided highlighting the significant topographical features.

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



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

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

#### **3.2.4.2 Potential impacts and mitigation measures**

The potential impacts of the project on the landscape character of the site and the surrounding area should be described. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as spoil dumps, excavated voids and broad-scale clearing. Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.


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

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

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

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

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



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

Details of lighting management for all stages of the project should be provided, with particular reference to the objectives and proposed management regime to mitigate or avoid:

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

### **3.2.5 Land contamination**

#### **3.2.5.1 Description of environmental values**

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

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

#### **3.2.5.2 Potential impacts and mitigation measures**

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

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

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


### **3.2.6 Land disturbance**

#### **3.2.6.1 Potential impacts and mitigation measures**

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

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

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



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

### 3.3 Nature Conservation

This section of the EIS should describe the environmental values of nature conservation of the project and how these have changed over time. The environmental values of nature conservation for the affected area should be described in terms of:

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

A discussion should be presented on the nature conservation values of the areas likely to be affected by the project. The flora and fauna communities which are rare or threatened, environmentally sensitive localities including waterways, wetlands, riparian zone, wilderness and habitat corridors should be described. The description should include a plant species list, a terrestrial and marine vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective. The description should indicate any areas of state or regional significance identified in an approved biodiversity planning assessment produced by the DERM .


The EIS should demonstrate how the project (including all associated infrastructure requirements such as access tracks) would comply with the following hierarchy:

- avoiding impact on areas of conservation value, rare and threatened species, and coastal wetlands, water quality, biodiversity values, connectivity and supporting ecological processes
- where avoidance is not possible, mechanisms to minimise impacts
- mitigation of impacts through rehabilitation and restoration
- measures to be taken to replace or offset the loss of conservation values where avoidance and mitigation of impacts cannot be achieved
- explanation of why measures above would not apply in areas where loss would occur.

Where relevant, these sections should discuss environmental offset requirements in accordance with the *Queensland Government Environmental Offsets Policy (QGEOP)* and taking into account the applicable specific-issue offset policies, as follows:

- *Policy for Vegetation Management Offsets (DNRW September 2007)*
- *Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss (DPIF, 2002)*
- *Offsets for Net Benefit to Koalas and Koala Habitat (EPA 2006)*
- *Policy for Biodiversity Offsets (consultation draft, EPA 2008)* or the finalised policy if available when the EIS is produced.





The boundaries of the areas impacted by the project within or adjacent to an endangered ecological community, including details of footprint width should be discussed. Where the project area would impact upon a threatened community, the discussion should include reasons for the preferred location or alignment and the viability of alternatives.

### 3.3.1 Sensitive environmental areas

#### 3.3.1.1 Description of environmental values

The EIS should identify areas that are environmentally sensitive in proximity to the project. Environmentally sensitive areas should also include areas classified as having national, state, regional or local biodiversity significance. Consideration should be given to national parks, conservation parks, nature refuges, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items relating to biodiversity, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, Japan-Australia Migratory Bird Agreement, China-Australia Migratory Bird Agreement, Republic of Korea-Australia Migratory Bird Agreement) and areas of cultural significance relating to biodiversity and scientific reserves.

The proximity of the project to any environmentally sensitive areas should be shown on a map of suitable scale. Areas that would be regarded as sensitive with respect to flora and fauna have one or more of the following features:

- important habitats of species listed under the *Nature Conservation Act 1992* (NC Act) and/or the EPBC Act as presumed extinct, critically endangered, endangered, vulnerable or rare
- regional ecosystems recognised by the DERM as 'endangered' or 'of concern' or 'not of concern' but where permits are no longer granted due to being at threshold levels, and/or ecosystems listed as 'presumed extinct', 'critically endangered' 'endangered' or 'vulnerable' under the EPBC Act
- ecosystems that provide important ecological functions, such as riparian vegetation, important buffer to a protected area, refugia or important habitat corridor between areas
- protected areas which have been proclaimed under the NC Act or are under consideration for proclamation.

#### 3.3.1.2 Potential impacts and mitigation measures

This section should discuss the following:

- the impact of the project on species, communities and habitats of local, regional, state or national significance
- proposals to mitigate impacts (e.g. timing of works, minimise width of disturbance, proposed rehabilitation of in-stream and floodplain disturbances)
- planned rehabilitation of vegetation communities and any relevant previous experience/experiments rehabilitating these communities
- Action plans for protecting rare or threatened species and vegetation types identified as having high conservation value should be described and any obligations imposed by state or federal government biodiversity protection legislation or policy should be discussed.
- appropriate mitigation measures for remnant ecosystems that may be affected by the project should refer to the relevant Regional Vegetation Management Codes (DNRW 2006) and address the *Policy for Vegetation Management Offsets* (DNRW 2007)

- offsets relating to residual impacts with regard to the *Policy for Vegetation Management Offsets* (DNRW, 2007) as well as the draft policy statement on the use of environmental offsets under the EPBC Act or the finalised policy if available when the EIS is produced
- where relevant, MNES identified under the EPBC Act.

Potential impacts and associated mitigation measures should be discussed further under Section 3.3.2 Terrestrial flora, Section 3.3.3 Terrestrial fauna, Section 3.3.4 Freshwater aquatic flora and fauna, and Section 3.3.5 Marine flora and fauna.

## 3.3.2 Terrestrial flora

### 3.3.2.1 Description of environmental values

A map of terrestrial vegetation at a suitable scale should be provided, with descriptions of the units mapped. Sensitive or important vegetation types should be highlighted, including any riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare or threatened species should be specifically addressed.

The surveys should include species structure, assemblage, diversity and abundance. The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

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

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

- location, extent, biodiversity status and conservation status of vegetation types using the DERM's regional ecosystem type descriptions in accordance with *Queensland Herbarium (2003)*, *Regional Ecosystem Description Database, Version 4.2, March 2005* and *The Conservation Status of Queensland's Bioregional Ecosystems, Sattler P.S. & Williams R.D. (Eds) 1999* or other more recent updates
- location of vegetation types of conservation significance based on DERM's regional ecosystem types and occurrence of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 2006* and subsequent amendments, as well as areas subject to the *Vegetation Management Act 1999*
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected areas such as the National Reserve System and other protected areas (e.g. national parks, conservation parks, resource reserves, nature refuges)
- the distribution and abundance of significant exotic and weed species
- any plant communities of cultural, commercial or recreational significance.

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, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database

- appropriate minimum site sizes should be selected, observing recognised sampling approaches and to provide an adequate sample of surveyed communities
- a complete list of species present at each site should be recorded
- the relative abundance of plant species present should be recorded
- any plant species of conservation, cultural, commercial or recreational significance should be identified
- specimens of species listed as 'protected plants' under the *Nature Conservation (Wildlife) Regulation 2006*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database
- vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database.

Existing information on plant species may be used instead of new survey work provided that the data is derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the EIS. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value.

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

The location of any horticultural crops on the project site should be shown.

### 3.3.2.2 Potential impacts and mitigation measures


This section should discuss all foreseen direct and indirect effects on terrestrial flora and vegetation and the potential level of environmental impact identified. Consideration of impacts including the quantity of vegetation to be removed (in terms of the total area), whether the proposal will bisect remnants and the magnitude of edge effects. Action plans for protecting rare or threatened species and vegetation types identified as having high conservation value should be described and any obligations imposed by Queensland or Commonwealth Government biodiversity protection legislation or policy should be discussed.

Construction and operation of the project involving clearing, or translocation of vegetation should be described, and indirect impacts on vegetation not cleared (such as edge effects of mining activities and/or infrastructure in close proximity to riparian vegetation and fauna movement corridors) should be discussed. For each component of the project, an assessment should be undertaken of the areas of state-owned land where commercial native forest log timber will be affected and where salvaged harvesting may be required.

Impacts during construction and operation of the project should be assessed. The number of hectares of remnant vegetation proposed to be cleared (by conservation status and regional ecosystem type) for the mine and each proposed infrastructure component should be identified. These figures should be discussed in terms of the long-term sustainability of these ecosystems to remain in the landscape at a regional level. Short 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.

Measures to mitigate the impacts of the project on vegetation types identified as having high conservation values, listed species and sensitive habitat or the inhibition of propagation should be described. This should also include the identification of potential offset areas, in an



'offset strategy', consistent with Queensland Government specific-issues offsets policies to compensate for any loss of vegetation. Offsets must be discussed with regard to impacts on EPBC matters, reference should be made to the eight principals set out in the DEWHA's Draft *Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999* or the finalised policy if available when the EIS is produced and its accompanying Discussion Paper in August 2007.

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 and mining, including the species chosen for revegetation which should be consistent with the surrounding associations. Details should be provided of the proposed completion criteria and indicators to measure the success of the rehabilitation objectives. Monitoring programs must also be outlined which can validate and/or demonstrate the long-term sustainability of the rehabilitation. Consideration should be given to the establishment of reference sites within the same sub-catchment if possible (at least two for each ecosystem type being rehabilitated) that could be monitored to provide benchmarking against rehabilitation completion criteria and indicators
- a description of the potential for the introduction and/or spread of weeds or plant disease, including:
  - identification of the origin of construction materials, machinery and equipment
  - staff/operator education programs
  - determination of the potential for the introduction of, or facilitation of, exotic, non-indigenous and noxious plants.
- a weed management plan should be developed to address the management of weeds and other exotic species related to the project site.

The above assessment should also include, where relevant, MNES identified under the EPBC Act.

### **3.3.3 Terrestrial fauna**

#### **3.3.3.1 Description of environmental values**

The terrestrial and riparian fauna occurring in the areas affected by the project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. Targeted surveys should be undertaken for EPBC listed fauna and flora likely to be impacted upon by the proposal and include opportunistic surveys for any other potentially occurring fauna and flora.

The description of the fauna present or likely to be present in the area should include:

- species diversity (i.e. a species list) and relative abundance of animals, including birds, reptiles and mammals (including bats)
- any species that are poorly known but suspected of being rare or threatened
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement

- existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of protected area management plans)
- use of the area by migratory birds, nomadic birds, fish and terrestrial fauna
- the existence of feral or exotic animals, with reference to the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

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

The EIS should contain results from surveys for these species. Surveys should be conducted at the appropriate time of the year when the species is known to be present on the areas to be affected by the project, so that identification and location of these species is optimal.

Methodology used for fauna surveys should be discussed with the DERM's regional office and 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 site of the project occurs. Relevant site data should be provided to the DERM in a format compatible with the EPA WildNet database for listed threatened species.

### 3.3.3.2 Potential impacts and mitigation measures

This section should discuss all foreseen direct and indirect effects on EPBC Act and state listed terrestrial fauna identified as affected through the additional surveys. Strategies for protecting rare or threatened species should be described and any obligations imposed by Queensland or Commonwealth government threatened species legislation or policy should be discussed.

Any EPBC Act or state recovery plans for potentially affected threatened species should be outlined, and strategies for complying with the objectives and management practices of relevant recovery plans should be described. Measures to mitigate the impact on habitat or the inhibition of normal movement, breeding or feeding patterns and change to food chains should be described. Any provision for buffer zones and movement corridors or special provisions for migratory or nomadic animals should be discussed.

With regard to terrestrial and riparian fauna, the assessment of potential impact should consider:

- impacts the project may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:
  - direct and indirect impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors
  - impacts on rare and threatened or otherwise noteworthy animal species
  - identification of the conservation importance of identified populations at the regional, state and national levels
  - cumulative effects of direct and indirect impacts
  - whether the proposal will bisect habitat areas
  - risks associated with edge effects
- measures to minimise wildlife capture and mortality during construction and operation
- 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

- methods for minimising the introduction of feral animals, and other exotic fauna. The study should develop strategies to ensure that the project does not contribute to increased encroachment of feral animal species. Reference should be made to the *Land Protection (Pest and Stock Route Management) Regulation 2003* and the local government authorities pest management plan when determining control strategies. The strategies for management of pest fauna should be discussed and provided in a working form in a pest management plan as part of the overall EM plan for the project.

These would also include, where relevant, MNES identified under the EPBC Act.

### 3.3.4 Freshwater aquatic flora and fauna

#### 3.3.4.1 Description of environmental values

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


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

- fish species, mammals, reptiles, amphibians and aquatic invertebrates occurring in waterways
- aquatic (waterway) plants, including any declared pest plants
- aquatic substrate and stream type
- wetlands listed by the DERM as areas of national, state or regional significance, and their values and importance
- Ramsar wetlands of international importance in terms of proximity to proposal and likelihood of impacts
- terrestrial species that are ecologically associated with wetlands or waterways and are likely to be affected by the project
- habitat requirements and the sensitivity of aquatic flora species to changes in flow regime, water levels and water quality in the project areas should be described
- Order or Family taxonomic rank of the presence and nature of stygofauna occurring in groundwater likely to be affected by the project. Sampling and survey methods should follow the best practice guideline which is currently published by the Western Australian Environmental Protection Authority – *Guidance for the Assessment of Environmental Factors No. 54 (December 2003) and No. 54a (August 2007)*. For project areas outside of the mine site, the assessment should be limited to areas where an appropriate risk assessment has determined that the project will have a material impact upon the groundwater resource.

These would also include, where relevant, MNES identified under the EPBC Act.

#### 3.3.4.2 Potential impacts and mitigation measures

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



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

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

- measures to minimise wildlife injury and mortality during construction, operation and decommissioning
- details of the methodologies that would be used to avoid injuries to 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
- details of measures to be used to maintain fish passage in waterways and wetlands that would be affected
- methods for minimising the introduction of feral species and other exotic fauna
- the potential for, and mitigation measures to prevent, the introduction, transfer or facilitation of exotic, non-indigenous and noxious plants and water borne insect pests
- a review of control measures to prevent increases in local populations and spread of biting insect species of pest and health significance associated with construction activities and disposal of construction wastes
- effects on key rare and threatened or otherwise noteworthy plant and animal species, including listed threatened and listed migratory species and their habitat
- the potential for, and mitigation measures to offset any proposed loss of, or disturbance to, fish habitat
- all permits/authorities required by the project associated with activities in waterways (e.g. permits under the *Fisheries Act 1994* to construct temporary or permanent waterway barriers)
- In any groundwater aquifers found to contain stygofauna, describe the potential impacts on stygofauna of any changes in the quality and quantity of the groundwater, and describe any mitigation measures that may be applied.

These would also include, where relevant, MNES identified under the EPBC Act.

### **3.3.5 Marine flora and fauna**

#### **3.3.5.1 Description of environmental values**

Marine flora and fauna occurring in the areas affected by the proposal should be described noting the patterns and distribution in coastal waters and estuaries. The description of the fauna and flora present in the areas should include all EPBC Act and state listed species:

- fish species, mammals, reptiles and crustaceans occurring in marine and estuarine waters, including pest species
- marine plants, including seagrass, saltmarsh and mangroves
- benthic, rocky shore and reefal habitats
- habitat for commercial and recreational fisheries
- particular reference habitat of any rare or threatened species
- proximity to declared fish habitat areas
- proximity to spawning, feeding, nursery, recruitment, migration and other critically important habitats

- bathymetry and water temperature
- presence of marine mammals and marine turtle foraging areas and nesting areas in vicinity of the proposed port
- sea floor habitat and benthic macroinvertebrate communities in the vicinity of the spoil ground

A description of significant marine fauna including distribution, habitat, feeding (patterns and food sources), reproductive cycles, threatening processes and current level of disturbance should also be provided. This section should also list marine plant species and location within the port area.

### 3.3.5.2 Potential impacts and mitigation measures

The potential impacts of the project on benthic habitat and marine fauna and flora, including sea grass beds, marine plants, saltpan, saltmarsh and mangrove communities, other fish habitats and other rare or threatened species should be assessed. The EIS should also discuss the potential for damage or disturbance to these ecosystems (including dependent faunal species) and other direct impacts such as physical collision of the dredge with marine fauna.

Modelling should be presented of sediment plumes extending from dredging and any proposed spoil dumping activities, including estimated off-target deposition of suspended solids. Modelling should also consider: temporary decreases in water transparency; increased concentrations in suspended matter; increased rates in sedimentation; disposal of sediments with high organic matter; changes to bathymetry; changes to sediment composition; removal or burial of sessile and motile organisms that are unable to burrow through the deposited layer; and introduction of marine pests. Cumulative impacts should also be considered, such as: reduction in light penetration; changes to benthic structure; alteration in current regimes; or reductions in dissolved oxygen.

Mitigation methods to reduce impacts on identified environmental values should be outlined. Restoration of the disturbed area (especially where marine plants have been removed) should also be outlined.

Describe where possible vectors for an introduction of a marine pest, possible impacts of a marine pest incursion and proposed mitigation measures. Describe on-going monitoring for marine pests in the port and proposed response arrangements if a marine pest incursion occurs.

The assessment should also include, where relevant, MNES identified under the EPBC Act.

## 3.4 Water resources

This section describes the existing environment for water resources that may be affected by the project in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994*, *Environmental Protection (Water) Policy 1997 [EPP (Water)]*, *ANZECC 2000*, the *National Water Quality Management Strategy (NWQMS)*, the *EPA Guideline: Establishing draft environmental values and water quality objectives* and the *Queensland Water Quality Guidelines 2006*. The definition of waters in the EPP (Water) includes the bed and banks of waters, so this section should address impacts on benthic environment, as well as the water column.



## 3.4.1 Surface water and water courses

### 3.4.1.1 Description of environmental values

The environmental values of the surface waterways (e.g. rivers, creeks, streams and other waterbodies including drainage lines and wetlands) of the affected area should be described in terms of:

- values identified in the EPP (Water)
- sustainability, including both quality and quantity
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form
- downstream water resource uses, including their significance to the local community and/or environment
- any water resource plans, land and water management plans relevant to the affected catchment, particularly the *Water Resource (Burdekin Basin) Plan 2007* and the *Water Resource (Great Artesian Basin) Plan 2006* listed under the *Water Act 2000*
- *ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters (2000)*.

A description should be given of the surface watercourses and their quality and quantity in the area affected by the project with an outline of the significance of these waters to the river catchment system in which they occur. Details provided should include a description of existing surface drainage patterns and existing and historical flow regimes in major waterways and wetlands and a description of present and potential water uses downstream of the areas affected by the project.

Details should also be provided of the likelihood of flooding, history of flooding, including extent, and levels and frequency. Flood studies should include a range of annual exceedance probabilities for affected waterways, based on observed data if available, or use appropriate modelling techniques and conservative assumptions if there are no suitable observations. The flood modelling should include local flooding due to short duration events from contributing catchments on site, as well as larger scale regional flooding including waterways downstream.

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

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the project. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the project area. Complementary stream-flow data should also be obtained from historical records (if available) to aid in interpretation. Where no background receiving water quality data is available for this purpose the proponent is required to begin collecting samples as soon as possible in accordance with the appropriate guidelines and manuals.

The water quality should be described, including seasonal variations or variations with flow where applicable. A relevant range of physicochemical [refer to the *Queensland Water Quality Guidelines (2007)*], chemical and biological parameters [refer to the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (NWQMS 4, 2000)*] should be measured to benchmark the extent of any potential future environmental harm on any potentially affected waterway or wetland system. All sampling should be performed in accordance with the *Water Quality Sampling Manual (EPA, 1999)* or the most current edition.

### 3.4.1.2 Potential impacts and mitigation measures

The water management systems for all project elements should be described, addressing surface water quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface water should be discussed, along with the proposal for the diversion or crossing of affected waterways during mining, stabilisation, restoration and integration of drainage with surrounding and downstream drainage features.

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

Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the project. Monitoring programs should also be designed to evaluate changes in the physical integrity and geomorphic processes associated with stream diversions.

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

Key water management strategy objectives include:

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


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

Potential impacts to the flow and the quality of surface waters from all phases of project activities, including waterway diversions or crossings, should be discussed, with particular reference to implications for current and potential downstream uses, including the requirements of any affected riparian area and in-stream biological uses in accordance with the EPP (Water) and the *Water Act 2000*.

Details of any proposed waterway barrier works with justification detailing the need for the barrier and any alternatives considered, should be included. Waterway crossings should be designed with reference to the Department of Primary Industries and Fisheries *Fish Habitat Guideline FHG001 – Fish Passage in Streams. Fisheries guidelines for design of stream crossings* (August 1998). The impacts of surface water flow on any existing water infrastructure should also be considered.

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

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



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

The need, or otherwise, for licensing of any dams (including referable dams) or waterway diversions, under the *Water Act 2000 and the Fisheries Act 1994*, should be discussed. The process for water allocation and water discharge should be established in consultation with the DERM. Consideration should also be given to any water allocation and management plans.

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

The environmental values of the surface waters potentially affected by the project should be identified in accordance with the EPP (Water). Surface water (and groundwater) quality objectives should be determined after consideration of the *Queensland Water Quality Guidelines (EPA, 2007)* and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (NWQMS 4, 2000)*.

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

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

### **3.4.2 Groundwater**


#### **3.4.2.1 Description of environmental values**

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

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

This section should include reference to the:

- nature of the aquifer/s
  - geology/stratigraphy
  - aquifer type - such as confined, unconfined
  - depth to and thickness of the aquifer and transmissivity of the aquifer
  - potential for aquifer interconnectivity
- hydrology of the aquifer/s
  - depth to water level and seasonal changes in levels, including response to existing extraction

- 
- groundwater flow directions (defined from water level contours)
  - interaction with surface water
  - existing and possible sources of recharge
  - vulnerability to pollution.

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

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

- values identified in the EPP (Water)
- sustainability, including both quality and quantity
- physical integrity, fluvial processes and morphology of groundwater resources.

### **3.4.2.2 Potential impacts and mitigation measures**

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

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the project to groundwater depletion or recharge.

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

The EIS should include mapping and a description of potential impacts for those areas where groundwater drawdown could deplete water in the root zone of vegetation with conservation value, particularly in localities with endangered regional ecosystems or threatened species. The sensitivity of the modelling should be of sufficient precision to fully assess the extent of groundwater depletion in the root zone of vegetation with conservation value.

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

An assessment should be undertaken of the impact of the project on the local ground water regime caused by any land disturbance.

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

## 3.5 Coastal environment

This section describes the existing coastal environment, which may be affected by the project in the context of coastal values identified in *State of the Coastal Zone Reports* and environmental values as defined by the EP Act and environmental protection policies.

This section should also identify actions associated with the project that are assessable development within the coastal zone and will require assessment under the provisions of the *Coastal Protection and Management Act 1995*.

### 3.5.1 Marine water and sediment

#### 3.5.1.1 Description of environmental values

Information should be provided on water quality in the sea and in estuaries below the limit of tidal influence, including heavy metals, acidity, turbidity, dissolved oxygen, nutrients and oil in water. Interaction of freshwater flows with marine waters, and significance with marine flora and fauna in and adjacent to the port area, should be addressed.

Describe the environmental values of the coastal seas of the affected area in terms of:

- Declared Fish Habitat Areas
- values identified in the EPP (Water)
- the State Coastal Management Plan and any regional coastal plan
- the Great Barrier Reef Marine Park
- the Great Barrier Reef Coastal Marine Park
- the Great Barrier Reef Zoning Plan (2003).

An assessment of physical and chemical characteristics of sediments should be provided for:

- the area to be dredged
- if offshore disposal is proposed, the disposal location for dredged material.


The description of sediment characteristics should be based on the results of sediment sampling and analysis conducted as per a Sampling and Analysis Plan (SAP) approved under the *Environment Protection (Sea Dumping) Act 1981*.

The chemical and physical characteristics of the material to be dredged, the spoil ground and control sites should be summarised. If the material is to be disposed in an offshore area, a statement as to the suitability of the sediment for unconfined ocean disposal should be made using the framework within the *National Assessment Guidelines for Dredging (Commonwealth of Australia, 2009)*.

#### 3.5.1.2 Potential impacts and mitigation measures

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

This section should also describe the water quality objectives used (including how they were developed), and how predicted activities will meet these objectives, (refer to the *Queensland Water Quality Guidelines* (EPA, 2007) and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, ANZECC, 2000).



The potential environmental harm caused by the project on coastal resources and processes should be described in the context of controlling such effects. State Planning Policy 2/02 – *Planning and Managing Development involving Acid Sulfate Soils* should be addressed as should the *State Coastal Management Plan 2001* and *DPIF Fish Habitat Guideline FHG 002 – Restoration of fish habitats (October 1998)*.

The role of buffer zones in sustaining fisheries resources through maintaining connectivity between coastal and riparian vegetation and estuarine and freshwater reaches of catchments should be discussed.

Impacts on water quality due to increased water turbidity, suspended solids and nutrients from the sediment due to dredging and sea disposal of material, if required, should be addressed through means such as modelling of sediment plumes extending from dredging and spoil dumping activities and strategies developed to address potential impacts.

The potential impacts of sediment quality on the marine environment should be discussed. This assessment should be guided by the suitability of the sediment for ocean disposal as determined by the framework outlined in the *National Assessment Guidelines for Dredging (Commonwealth of Australia, 2009)*.

A long-term dredge spoil disposal strategy should be described to ensure the protection and enhancement of environmental values. The duration of the strategy should be greater than 20 years of the design life of the proposal. The strategy should incorporate the other findings of section 3.5 Coastal environment. Appropriate beneficial use should be investigated in accordance with section 3.8 Waste.

In addition to the above considerations, the following guidelines and standards should be considered:

- the EPP (Water), and any recent or proposed amendments that incorporate recommendations of the National Environment Protection Measures
- *ANZECC Australian Water Quality Guidelines for Fresh and Marine Water Quality (NWQMS 4, 2000)*
- amelioration or mitigation measures to address each activity identified to impact on local and regional water quality
- any monitoring of water quality recommended during the dredging activities to ensure environmental values are protected.

## **3.5.2 Coastal processes**

### **3.5.2.1 Description of environmental values**

This section should describe the physical processes of the adjacent marine environment, including but not limited to currents, tides and storm surges.

It should also describe the environmental values of the coastal resources of the affected area in terms of the physical integrity and morphology of landforms created or modified by coastal processes. Assessment should be based on hydrodynamic investigations and include a description of sediment dynamics at any proposed off-shore disposal ground based on the influence of tides, waves, currents and turbidity.

The relationship of these processes to marine flora and fauna and biological processes within the study area should also be discussed. The relationship between currents, wave actions and extreme events (such as cyclones) and how they influence coastal processes should be discussed.

### 3.5.2.2 Potential impacts and mitigation measures

The impacts of development of the berth area on hydrodynamic processes within the port study area should be described. In particular, impacts on siltation and any implications for marine flora and fauna and/or biological processes should be discussed, including generation and migration of turbid plumes. Information on currents in the region should be used to predict impacts, including an assessment of these impacts on marine environmental values.

The EIS should discuss strategies to mitigate potential impacts on coastal processes, as a consequence of the project.

### 3.5.3 World heritage and marine park

#### 3.5.3.1 Description of environmental values

Describe the current world heritage and marine park zoning and the implications for the proposed port referring to the limits, restrictions and conditions associated with such designations.

#### 3.5.3.2 Potential impacts and mitigation measures

Port construction and operations are to be carried out within the Great Barrier Reef World Heritage Area (GBRWHA), the Great Barrier Reef Marine Park area and the Great Barrier Reef Coastal Marine Park (GBRCMP) area and will be subject to the provisions of *The Great Barrier Reef Zoning Plan (2003)*.

Potential impacts on the National and World Heritage values of the Great Barrier Reef should be addressed explicitly in the EIS. The assessment of environmental variables such as water quality and other MNES, such as threatened species and communities, will be relevant to the assessment of impacts on the National and World Heritage values of the GBRWHA. Clear cross referencing should be used where potential impacts on National and World Heritage values are addressed in different sections of the EIS.

Impacts to be considered should include but not be restricted to:

- impacts resulting from potential changes to the water quality of the GBRWHA arising from runoff from construction and operational activities, coal stockpiles, and port facilities; spills of contaminants during construction and operation, disturbance of potential acid sulphate soils and changes to the hydrology or quality of water in watercourses entering the World Heritage Area
- construction, dredging and spoil disposal in the GBRWHA either through the direct disturbance to values or impacts on water quality
- vessel strikes on species of conservation significance
- disturbance from changes in lighting and noise at the port
- changes to erosional and depositional processes along the coastline
- the increase in risk of introduction of introduced marine pests.

The EIS should consider the potential impacts on National and World Heritage values under each of the criteria against which the place was listed. The National and World Heritage criteria and examples of the values of the GBRWHA are available: [www.environment.gov.au/heritage/about/index](http://www.environment.gov.au/heritage/about/index).

Assessment criteria outlined in the *Great Barrier Reef Marine Park Regulations 1983* should also be addressed including (as derived from the regulations):

- the objective of the zone in which the proposal is located
- the need to protect the cultural and heritage values held in relation to the marine park by traditional owners and other people
- the likely effect of granting permission on future options for the marine park

- the conservation of the natural resources of the marine park
- the nature and scale of the proposed use in relation to the existing use and amenity, and the future or desirable use and amenity of the relevant area and of nearby areas
- the likely effects of the proposed use on adjoining and adjacent areas, and any possible effects of the proposed use on the environment and the adequacy of safeguards for the environment
- the means of transport for entry into, use within or departure from the zone or designated area and the adequacy of provisions for vessel mooring, landing, loading and unloading
- the health and safety aspects involved, including the adequacy of construction, in relation to any structure, vessel or work to which the proposed use relates
- the arrangements for making good any damage caused to the marine park by the proposed activity
- any other requirements for ensuring the orderly and proper management of the Marine Park.

## 3.6 Air quality

### 3.6.1 Description of environmental values

This section should describe the existing air environment 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*.

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

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


### 3.6.2 Potential impacts and mitigation measures

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

This section should describe the quantity and quality of all air emissions, including particulates and greenhouse gases from all components of the project during construction, operation and decommissioning.

The proposed levels of emissions should be compared with the *National Environmental Protection Measures (NEPM) for Ambient Air Quality (1998)*, the *National Health Medical Research Council ambient air quality standards setting: An approach to health based hazard assessment*, and the EPP Air.





Where appropriate, the predicted average ground level concentrations in nearby areas should be provided. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary. Ground level predictions should be made at any residential, industrial and agricultural site believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained. The assessment of the project's impact on air quality should consider the following matters:

- the features of the project designed to suppress or minimise emissions, including dust (PM10 fraction of particulates) and odours
- emissions of dust, fumes and odours during both normal and upset conditions and the potential impacts of such emissions on surrounding land uses and nearest sensitive receptors
- identification of climatic patterns that could affect dust generation and movement
- impact on terrestrial flora and fauna
- predicted changes to existing air quality from vehicle emissions and dust generation along haulage routes (internal and external to construction sites)
- impacts on air quality from gaseous emissions including greenhouse gas emissions and ozone depleting substances
- an evaluation of the contribution of nitrogen oxides, sulphur oxides and volatile hydrocarbon emissions from the project to impacts within the local air shed, including both acute and cumulative impacts, in conjunction with existing emission sources within the region
- the human health risk associated with emissions from the facility of all hazardous or toxic pollutants, whether or not they are covered by the NEPM or the EPP (Air)
- air quality predictions should be compared to the relevant goals in the NEPM and the EPP (Air) goals
- air shed management and the contribution of the project to air shed capacity in view of existing and future users of the air shed for assimilation and dispersion of emissions.

For the railway component, the following air quality issues should be considered in particular:

- impacts of dust generation from construction activities, especially in areas where the corridor follows existing road networks or passes in close proximity to residences
- 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 operation of diesel powered locomotives in rail operations
- describe the potential for coal dust emissions to provide an environmental nuisance to any sensitive receptor along the proposed rail corridor.

For the mine component, the following air quality issues should be considered in particular:

- the potential impacts of dust on surrounding pasture and crops, rainwater tanks, and adjoining facilities such as residences, accommodation village and airstrip
- dust impacts generated by the operation of overland conveyor systems and mine draglines
- potential impacts from airborne sulphides on property and equipment due to rusting.

For the port component, the following issues should be considered in particular:

- the potential impact of coal dust on the operations of other projects proposed for location within the chosen port precinct in the APSDA
- the potential impact of dust deposition on surrounding flora and fauna.

For each of the rail, mine and port components of the project, the proposed dust mitigation measures should be described to achieve air quality goals.

### 3.6.3 Greenhouse gas emissions and abatement

This section of the EIS should:

- provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO<sub>2</sub> equivalent' terms
- estimate emissions resulting from proposed project activities, including transportation of products and consumables and fossil fuel based energy consumption
- briefly describe method(s) by which estimates were made.

The Department of Climate Change *National Greenhouse Accounts (NGA) Factors* can be used as a reference source for emission estimates and supplemented by other sources where practicable and appropriate. Coal mining projects should include estimates of coal seam methane to be released as well as emissions resulting from such activities as transportation of products and consumables and energy use by the project.

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

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the project, including such activities as transportation of products and consumables, and energy use by the project
- an assessment of how the preferred measures minimise emissions and achieve energy efficiency
- an indication of how the preferred measures for emission controls and energy consumption compare with practice in the relevant sector of industry with a view to achieving best practice environmental management
- a description of any opportunities for further offsetting greenhouse gas emissions through indirect means.

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

- commitments to the abatement of greenhouse gas emissions from the project with details of the intended objectives, measures and performance standards to avoid, minimise and control emissions
- commitments to energy management, including undertaking periodic energy audits with a view to progressively improving energy efficiency
- a process for regular review of new technologies to identify opportunities to reduce emissions and use energy efficiently, consistent with best practice environmental management
- any voluntary initiatives such as projects undertaken as a component of the national Greenhouse Challenge Plus program, or research into reducing the lifecycle and embodied energy carbon intensity of the project's processes or products
- opportunities for offsetting greenhouse emissions, including, if appropriate, carbon sequestration and renewable energy uses

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

## 3.7 Noise and vibration

### 3.7.1 Description of environmental values

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

If the proposed activity could adversely impact on the noise environment, baseline monitoring should be undertaken at sensitive receptors for the acoustic environment affected by the proposal. Environmental values and the respective sensitive receptors for the acoustic environment are defined in the *Environmental Protection (Noise) Policy, 2008* [EPP (Noise)]. Measured background noise levels that take into account seasonal variations are required. The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Sufficient data should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the night. Monitoring methods should adhere to accepted best practice methodologies, relevant DERM guidelines and Australian Standards, and any relevant requirements of the EPP (Noise).

The following guidelines and standards should be considered:


- AS1055.1 and AS1055.2, 1997. *Description and Measurement of Environment Noise, Recognised Sleep Disturbance Criteria, British Standards BS7385, part 2, 1993*
- *Interest in Planning Schemes No. 3* (Queensland Transport) and *Queensland Rail Code of Practice for Railway Noise Management (November, 2007)*
- *Evaluation and Measurement for Vibration in Buildings, Guide to Damage Levels from Ground-borne Vibration, BS6472, 1992 - Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80 Hz)*
- *The Health Effects of Environmental Noise – other than hearing loss* (enHealth Council, 2004)
- Australian/New Zealand Standard AS/NZS 2107-2000, Acoustics – *Recommended Design Sound Levels and Reverberation Times for Building Interiors*
- *World Health Organisation Guidelines for Community Noise, 1999.*

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

The results of any baseline monitoring of noise and vibration in the proposed vicinity of the project should be described.

### 3.7.2 Potential impacts and mitigation measures

The potential environmental harm of noise and vibration at potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved and measurable indicators. Particular consideration should be given to emissions of low-frequency noise; that is, noise with components below 200 Hz.



The need or otherwise for noise modelling should take into account the distance of relevant project sources of noise from neighbouring sensitive receptors such as residential and commercial developments believed to be sensitive to the effects of noise. Noise from mining, beneficiation and power generation components of the project should be modelled, where appropriate, using a suitable acoustic model covering the construction and operational phases.

The assessment should also include environmental impacts on terrestrial animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts should be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise. Reference should also be made to the EPA Guideline: *Planning for Noise Control*.

Information should be supplied on blasting which might cause ground vibration or fly rock on, or adjacent to, the site with particular attention given to places of work, residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. A discussion should be provided of measures to prevent or minimise environmental nuisance and harm. Blasting noise and vibration limits are provided in the EP Act, Section 440ZB Blasting. Reference should also be made to the EPA Guideline: *Noise and vibration from blasting*.

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

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

## 3.8 Waste


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

### 3.8.1 Waste generation and management

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

- the amount and characteristics of solid and liquid waste produced
- hazardous materials to be stored and/or used on-site, including environmental toxicity data and biodegradability
- any waste treatment process involved, including site drainage and erosion controls
- specific details (using maps and plans as appropriate) of:
  - generation points
  - storage methods and facilities
  - quantities.

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



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

- volume estimates of industrial and domestic effluent that will be produced at each project site
- quality of effluent produced
- any mobile sewerage facilities to be used.

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

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

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

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

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

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

- air emissions—this section should 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 in the mitigation of impacts from air emissions should be described in section 3.6 Air quality.
- excavated waste—this section should describe and show the location, design and methods for constructing dumps for waste rock and subsoil. The location of the dumps should be shown on a map relative to topography and other natural features of the area.
- tailings—this section should describe the tailings waste produced by preparation and/or processing plants and the proposed methods for its disposal. Alternative options for tailings disposal including the proposed location, site suitability and volume of any tailings storage and/or disposal site(s), including the method of construction should be presented.
- the EIS should include an estimate of the quantity of tailings to be produced by the project and its processing plant annually for the life of the mine. Tailings characterisation information should also be presented in this section.
- the construction of a tailings storage facility should be described with regard to construction material and design. The EIS should address how the tailings storage facility complies with relevant codes for the construction of such containment systems.
- strategies to monitor and manage seepage into ground and surface waters should be presented. The location of the storage and/or disposal site with regard to adjacent creeks and rivers should be described.
- solid waste disposal—this section should 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. The proposed location, site suitability, dimensions and volume of any landfill, including its method of construction, should be shown.
- liquid waste— this section should describe the origin, quality and quantity of wastewater and any immiscible liquid waste originating from the project. Particular attention should be given to the capacity of wastes to generate acid, and saline or sodic wastewater. A water balance for the mine and processing plant is required to account for the estimated usage of water.

The EIS may need to consider the following effects:

- groundwater from excavations
- rainfall directly onto disturbed surface areas
- run-off from roads, plant and industrial areas, chemical storage areas
- drainage (i.e. run-off plus any seepage or leakage)
- seepage from other waste storages
- water usage for process use, dust suppression, and domestic purposes
- evaporation
- dredge spoils
- quarantine ship waste handling, treatment and management and ballast water management with reference to the MARPOL Convention
- domestic sewage treatment—disposal of liquid effluent and sludge
- water supply treatment plant—disposal of wastes.

## 3.9 Transport

### 3.9.1 Transport methods and routes

The assessment of transport impacts should be presented as separate sub-sections of the EIS, for each project-affected mode (road, rail, air and sea). The assessment should provide sufficient information to allow an independent assessment to be made of how existing transport infrastructure will be affected by project transport at the local and regional level.

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

- any proposed new or alterations to transport-related infrastructure required by the project (as distinct from impact mitigation works). This includes 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 Department of Transport and Main Roads (DTM) *Transport Operations (Road Use Management – Dangerous Goods) Regulation 2008* and *Transport Infrastructure (Dangerous Goods by Rail) Regulation 2008*
- the construction of any project-related plant and utilities, within or impacting on the jurisdiction of any transport authority
- existing traffic volumes on the proposed transport routes
- volumes, tonnage, and composition of construction inputs and production outputs
- hazardous or dangerous material that may be transported
- method of transport (e.g. sea, rail, road) and the type and number of vehicles most likely to be used for transport
- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- number of trips generated (both light and heavy vehicles)
- origin and destination of inputs and outputs and transport routes proposed (with the use of maps)
- likely heavy and oversize/indivisible loads (volume, tonnage, composition, timing and routes) highlighting any vulnerable structures or deficient road width or geometry along proposed routes
- timing and duration of transport activities.

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

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

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

### 3.9.2 Potential impacts and mitigation measures

The impact assessment must include:

- details of assessment methodology adopted with a summary of consultation undertaken with transport authorities (for example, DTM and local government) regarding the scope of the impact assessment and methodology to be used
- details of all base data assumptions, including the current condition of the affected network and its performance
- details on possible interruptions to transport operations, including any delays to road traffic at any rail crossings
- details of any impacts on the natural environment within the jurisdiction of an affected transport authority (for example road and rail corridors)
- details on the nature and likelihood of product-spill during transport, if relevant
- **road impacts**—in assessing road impacts, reporting should be in general accordance with Department of Main Roads Guidelines for Assessment of Road Impacts of Development (2006), and include:
  - an assessment of project impacts (from either transport or project operations) on the safety, efficiency and condition of road operations and assets
  - an assessment of project impacts on overland water-flows and their interaction with the road network
  - an assessment of project impacts on any existing or proposed pedestrian / cycle networks
  - an assessment of project impacts on any existing public transport networks (assets and services).
- **rail Impacts**—in assessing rail impacts, the proponent should consider:
  - project impacts on the amenity and health of adjacent land users as a result of dust, noise and vibration
  - impacts on passenger transport and services, should the project generate large public transport trip movements.
  - location and nature of proposed rail-road crossings and the requirement for safety measures
- **air and sea port impacts**—in assessing air and sea impacts, the proponent is to consider project impacts on the ongoing operation of existing air and sea port facilities, including capacity of throughput and any land-use impacts as a result of the project's operations.

Mitigation strategies to address project impacts should be included for each project-affected transport mode. The proponent should discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. These mitigation strategies are to be prepared by the proponent in close consultation with relevant transport authorities and include:

- consideration of any transport authority's works program and forward planning
- proposed construction plans of all required transport infrastructure works in accordance with relevant and accepted authority standards and practices
- timing and responsibilities of these works (when and by whom)
- a summary of relevant approvals and legislative requirements needed to implement mitigation strategies including transport infrastructure works required by the project.



## 3.10 Indigenous cultural heritage

### 3.10.1 Description of Indigenous cultural heritage values

The EIS should describe the known Indigenous cultural heritage values that may be affected by the project. An Indigenous cultural heritage survey (as part of the Cultural Heritage Management Plan (CHMP) process or otherwise) should be undertaken for significant Indigenous objects and significant indigenous areas. The Indigenous cultural heritage survey should:

- refer to the DNRW Indigenous Site Database and any existing literature relating to the affected areas
- refer to:
  - the consultation and negotiation with traditional owners and the outcomes about:
    - significant Indigenous objects and significant indigenous areas
    - confidentiality of culturally sensitive information
  - the involvement of traditional owners in field surveys
- include locations of significant Indigenous objects and areas identified during the survey and which are likely to be impacted by the project
- provide a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due for any confidentiality requirements specified by community representatives).


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

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

### 3.10.2 Potential impacts and mitigation measures

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

- a description of the significance of artefacts, items or places of conservation or cultural heritage value likely to be affected by the project and their values at a local, state and national level
- recommended means of mitigating any negative impacts on cultural heritage values and enhancing any positive impacts
- liaison with representatives of relevant Indigenous communities concerning:
  - places of significance (including archaeological sites, natural sites, story sites etc), and appropriate involvement in field surveys
  - any requirements by communities and/or informants relating to selection of consultants and confidentiality of site data
  - assessment of significance of any cultural heritage sites/places located
- identification of locations of culturally significant sites likely to be impacted by the project, including:

- 
- stone artefact scatters
  - culturally significant vegetation
  - buildings or places of archaeological significance
  - archaeological sites, natural sites, story sites etc.

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

The EIS should describe how the potential impacts to Indigenous cultural heritage cultural heritage values in the vicinity of the project will be managed. Cultural heritage management for the project should be discussed in terms of the CHMP and NTA that currently exist between the proponent and the Native Title Claimant groups (Traditional Owners) for the project area. The EIS should explain how the CHMP and NTA satisfy the statutory responsibilities and duties of care to protect areas and objects of cultural heritage significance under the *Aboriginal Cultural Heritage Act 2003*, and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

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

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

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

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

## 3.11 Non-Indigenous cultural heritage

### 3.11.1 Description of non-Indigenous cultural heritage values

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

- consultation with:
  - the Australian Heritage Places Inventory
  - the 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 affected areas
- liaison with relevant community groups/organisations (e.g. local historical societies) concerning:
  - places of non-Indigenous cultural heritage significance; and
  - opinion regarding significance of any cultural heritage places located or identified
- the location of historical mining areas, which should be shown on maps, including the potential for former mining zones or historical workings to cause slumping or other problems
- include locations of culturally significant sites likely to be impacted by the project
- provide a constraints' analysis of the proposed development area to identify and record non-Indigenous cultural heritage places
- the location of any mining areas with historical significance should be shown on maps
- provide a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due regard for any confidentiality requirements specified by community representatives).

As a minimum, investigations and consultation should be undertaken in such manner and detail to satisfy statutory responsibilities and duties of care, under the EPBC Act and *Queensland Heritage Act 1992*.

### 3.11.2 Potential impacts and mitigation measures

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

- 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 and national level
- recommended means of mitigating any negative impacts on non-Indigenous cultural heritage values and enhancing any positive impacts
- strategies to manage places of historic heritage significance, taking account also of community interests and concerns.

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

# 4 Social values and management of impacts

## 4.1 Social

The Social Impact Assessment (SIA) should be conducted in consultation with the DIP Social Impact 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.

It is recognised that the nature of the assessment may need to take into account the relative profiles of the mine, the rail corridor, and the port facilities, and their respective workforces for construction and operation.

### 4.1.1 Social and cultural area

The SIA should define the project's social and cultural area of influence taking into account:

- the potential for social and cultural impacts to occur at the local, district, regional and state level
- the location of other relevant proposals or projects within the local area, district, or region
- the location and types of physical and social infrastructure, settlement and land use patterns
- the social values of the local area, district, and region that might be affected by the project (e.g. including 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 and industry commitment to the concept of a 'social licence to operate', 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.

Therefore, this section of the SIA should detail the community engagement processes through which the proponent conducted open and transparent dialogue with stakeholders with an interest in the project's planning and design stages and future operations including affected local authorities and relevant state authorities. Engagement processes will involve consideration of social and cultural factors, customs and values, including relevant consideration of linkages between environmental, economic, and social impact issues is required.

### 4.1.3 Social baseline study

In concert with a community engagement process, 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, the potential adverse and positive social impacts, and assist in the development of mitigation and benefit strategies and measures to address these issues. The social baseline study should be based on qualitative, quantitative, and participatory methods, 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 as 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 enumerated population for the social and cultural area and the full time equivalent (FTE) 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 (percent of dwellings in each category), and weekly rent (percent 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; and 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 details of:

- the social infrastructure including community and civic facilities, services and networks that help individuals, families, groups and communities meet their social needs, maximise their potential for development, and enhance community wellbeing (for definition see South East Queensland Plan 2005-2026 Implementation Guidelines No. 5: [www.dip.qld.gov.au/resources/guideline/Implementationguideline5.pdf](http://www.dip.qld.gov.au/resources/guideline/Implementationguideline5.pdf))
- 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, and 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 (e.g. bush tucker and medicinal plants).

#### 4.1.4 Workforce profile

The SIA should include a profile of the workforce which 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
- the 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 and variations in the workforce numbers for the duration of the project and show anticipated peaks in worker numbers during the construction period.

The SIA should provide an outline of recruitment schedules and policies for recruitment of workers, addressing recruitment of local and non-local workers including Indigenous workers and people with a disability

If re-locatable camp sites are to be used to accommodate the workforce, details on the number, size, location (shown on a map), management, proximity to the construction site, and typical facilities for these sites should be provided. Information should outline any local government or other regulatory approvals required for establishment and operation of such camps, including building, health and safety and waste disposal purposes.

The section should provide information in relation to the location of other major projects or proposals under study within the social and cultural area together with workforce numbers.

#### 4.1.5 Potential impacts

This section of the SIA should assess and describe the type, level and significance of project's social impacts (both beneficial and adverse) on the local and cultural area, based on outcomes of community engagement processes and the social baseline study. Further it should:

- 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 how the project may affect their business and plan for the continuing 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 and describe the impacts including direct, indirect and secondary impacts resulting from any existing projects and the proposed project including the important cause and effect relationships between human activities and resources, ecosystems, traditional Indigenous lands, and human communities. An assessment of the size, significance, and likelihood of these impacts should be considered at the local and regional level taking into account the following possible issues:
  - 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. This information is to be presented according to occupational groupings of the workforce. In relation to the source of the workforce, information is required as to 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
- comment on how much service revenue and work from the project (e.g. provisioning, catering and site maintenance) would be likely to flow to the project's social and cultural area, particularly if a fly-in, fly-out workforce is proposed
- impacts of both construction and operational workforces, their families, and associated contractors on housing and accommodation availability and affordability, and land use and land availability. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed at a local, regional and state scale including direct impacts on Indigenous people.

The SIA will include an evaluation of the potential cumulative social impacts resulting from the project including an estimation of the overall size, significance and likelihood of those impacts. Cumulative impacts in this context 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 resource development projects in the area which are publicly known or communicated by DIP, if they overlap the proposed project in the same time frame as its construction period.

#### **4.1.6 Mitigation measures and management strategies**

For identified social impacts, social impact mitigation strategies and measures should be presented 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
- the 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
- the adequate provision of education, training and employment for women, people with a disability, and Indigenous peoples.

The proponent should describe any consultation about acceptance of proposed mitigation strategies and how practical management and monitoring regimes are proposed to be implemented.

A draft social impact management plan should be presented that promotes an active and ongoing role for impacted communities and local authorities through the project life cycle from planning through to approvals, construction, operations and decommissioning should be developed. The draft plan 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.

## 4.2 Health and safety

### 4.2.1 Description of public health and safety community values

This section should describe existing community values for public health and safety that may be affected by the project. Populations likely to be affected by air emissions, including odours, should be identified and described. Particular attention should be paid to those sections of the population, such as children and the elderly that are especially sensitive to environmental health factors.

### 4.2.2 Potential impacts and mitigation measures

This section should 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.

The EIS should assess the effects on the project workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from project operations and emissions. Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety and quality of life from factors such as air emissions, odour, dust and noise.

An assessment of driver fatigue for workers travelling to and from regional centres and key destinations should be discussed.

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

The EIS should include a review of control measures to prevent increases in local populations and spread of biting insect species of pest and health significance associated with construction activities and disposal of construction wastes.

The EIS should address the project's potential for providing disease vectors. Measures to control and prevent mosquito and biting midge breeding sites during construction and operation should be described with reference to Queensland Health's *Guidelines to minimise mosquito and biting midge problems in new development areas*.

Any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion (e.g. via use on food crops). Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals. Practical monitoring regimes should also be recommended in this section.



# 5 Management of impacts on state and local economies

## 5.1 Economy

### 5.1.1 Description of affected local and regional economies

This section should describe the existing economy in which the project is located and the economies materially impacted by the project. In particular, the following should be addressed:

- define the economy in which the project is to be located including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc.
- describe the economy including:
  - gross regional product or other appropriate measure of annual economic production
  - population
  - labour force and unemployment statistics
  - infrastructure
  - availability and prices of goods and services.
- describe 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
- discuss regional resource endowment, competitive advantage and expected future growth
- describe 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
  - availability of suitable land for support industrial uses
  - construction services and building inputs market.
- with regard to the region's key industries:
  - provide information on current input costs (wage rates, building costs, housing rent etc)
  - types and numbers of businesses
  - provide information on land values in the region by type of use.

### 5.1.2 Potential impacts and mitigation measures

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

The analysis should include the direct economic impacts on industry and the community including:

- property values
- industry output
- employment
- factor incomes.

The analysis should also:

- assess any forgone industry output from the project
- assess any forgone opportunities and impacts to households (e.g. recreation, increased travel times)
- assess the indirect impacts likely to flow to other industries and economies from the development of the project. This should also consider the implications of the project for future development.

### 5.1.2.1 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 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 government policy, where relevant, 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* (the 10 percent policy)
  - Indigenous employment opportunities, with regard to the Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (the 20 percent policy)
  - the use of locally sourced goods and services, with regard to the *Local Industry Policy* (Department of State Development, 1999).

### 5.1.2.2 Strategies to mitigate disruption to the local economy during construction and operation

The economic assessment should outline strategies to mitigate disruption to the local economy during construction and operation to address:

- all potential changes to industry practices likely to occur during construction and operation of the project
- all potential impacts on households (travel time, noise etc.) likely to occur during construction and operation of the project
- the estimated cost of these changes if material
- the measures to be taken to minimise disruption or alleviate cost impacts of the project.



This section should also address the current and future management processes for adjacent properties which are likely to be impacted by the project during construction and/or operation. Mention should be made of:

- 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
- the range of measures required to mitigate real and potential disruptions to rural practices and management of properties.

## 5.2 Sustainable development

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

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

## 6 Hazard and risk

A preliminary hazard identification exercise should be conducted in order to identify the nature and scale of hazards that might occur during the construction and operation of the project. This would be expected to include hazards such as:

- construction accidents
- accidental release of hazardous goods or other materials
- fires associated with incidents arising from the project activities
- vulnerability of the project area to bushfire, flooding, cyclones and other natural disasters

A set of representative incident scenarios should be selected. This set should include worst case scenarios

A risk assessment consistent with Australian / New Zealand Standard for Risk Management AS4360, should be conducted. The study should assess risks during the construction, operational and decommissioning phases of the project and should be assessed in quantitative terms where possible. The analysis should be expressed in terms of safety, human health, injury and fatality.

In regard to the on-site handling and storage of explosive raw material, consultation is encouraged with the Department of Community Safety Chemical Hazards and Emergency Management Services Unit.

Details should be provided on the safeguards that would be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites within and adjacent to the project area.

### 6.1 Emergency management plan

An outline of the proposed emergency management procedures should be provided for the range of situations identified in the above risk assessment where there are measurable risks. This should include an overview of the objectives and management principles adopted for the preparation of a detailed emergency plan (including emergency response and recovery/cleanup procedures) in consultation with the relevant emergency services. Planning should include reference to *State Planning Policy 1/03, Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*.

In particular, the following should be addressed:

- contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) oil spills during construction, operation and maintenance of the project
- contingency plans to account for natural disasters such as storms and fires during the construction, operation and maintenance phases
- emergency planning and response procedures that have been determined in consultation with state and regional emergency service providers
- plans for involvement of the relevant state agencies (such as the Queensland Police Service and Department of Community Safety, which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland) concerning emergency medical response, transport and first aid matters.

## 7 Cumulative impacts

The purpose of this section is to provide clear and concise information on the cumulative impacts that could occur as a consequence of the project in conjunction with the development of any other existing or proposed developments. In particular, the interrelationship of cumulative impacts as they relate to specific issues (e.g. water, air, noise, cultural heritage, social, economic etc.) should be considered.

Cumulative impacts should be considered at a local and regional level, accumulating over time. Consideration should also be made to the exacerbation of impacts in intensity or scale, frequency or duration, and in either isolation or combination with other known existing or planned impacts.

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

Cumulative impacts should also take into consideration other projects which have been publicly announced or communicated to the proponent by DIP. The requirements of any relevant state planning policies, environmental protection policies, national environmental protection measures, water resource planning and any other relevant plans should also be addressed.

The methodology to be used to determine the cumulative impacts of the project should be discussed. The methodology should detail the range of variables to be considered including, where applicable, relevant baseline or other criteria upon which the incremental aspects of the project should be assessed.

## 8 Environmental management plan

This section of the EIS should detail the EM plan developed for the project. Separate EM plans should individually address the discrete project elements. The EM plans should be developed from, and be consistent with, the preceding information in the EIS.

The EM plan should be developed from the mitigation measures detailed in part 3 of the EIS. Its purpose is to set out the proponents' commitments to environmental management. That is, how environmental values will be protected and enhanced.

The EM plan is an integral part of the EIS, but should be capable of being read as a stand-alone document without reference to other parts of the EIS. For a mining project the EM plan must meet the content requirements of section 203 of the *Environmental Protection Act 1994*.

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

- potential impacts on environmental values
- mitigation strategies
- relevant monitoring parameters, site replication, monitoring frequency, equipment, methods, analysis, quality assurance procedures undertaken and qualifications of the personnel involved
- appropriate indicators and performance criteria
- reporting requirements
- appropriate corrective actions, should an undesirable impact or unforeseen level of impact occur
- the recording of and response to complaints.

The aims of the EM plans are to provide:

- commitments by the proponent to practical and achievable strategies and design standards (performance specifications) for the management of the project to ensure that environmental requirements are specified and complied with
- an integrated plan for comprehensive monitoring and control of impacts
- local, Queensland and Commonwealth government authorities, stakeholders and the proponent with a common focus for approvals conditions and compliance with policies and conditions
- the community with evidence that the environmental management of the project is acceptable.

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

- environmental protection objectives for enhancing or protecting each relevant value
- indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved
- environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective

- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  - communication
  - continuous improvement
  - environmental auditing
  - monitoring
  - reporting
  - staff training
  - a decommissioning program for land proposed to be disturbed under each relevant aspect of the project.

The recommended structure of each element of the EM plan is:

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

## 9 Conclusions and recommendations

The EIS should make conclusions and recommendations with respect to the project based on the studies presented, the EM plans and conformity of the project with legislative and policy requirements.

## 10 References

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

## 11 Recommended appendices

### 11.1 Final TOR for this EIS

A copy of these TOR should be included in the EIS.

### 11.2 TOR cross-reference table

A cross reference table should be provided which links the requirements of each section/subsection of the TOR with the corresponding section/subsection of the EIS where those requirements have been addressed.

### 11.3 Development approvals

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

### 11.4 EPBC report

A report addressing MNES and potential impacts of the project is recommended.

### 11.5 Consultation report

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

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

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





## 11.6 Study team

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

## 11.7 Glossary of terms

A glossary of technical terms and acronyms should be provided.

## 11.8 Specialist studies

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

- flora and fauna studies including subregional analysis of representativeness and adequacy of protection for the terrestrial / riparian vegetation communities and their component flora and fauna taxa within affected areas
- an integrated assessment of relative biodiversity/conservation values, based on the methodology outlined in EP Act
- air pollution, noise and vibration
- waterway hydrology
- groundwater
- geology
- economic studies and/or cost-benefit analyses
- hazard and risk studies
- land use and land capability studies.

## 11.9 Corporate environmental policy

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

## 11.10 List of proponent commitments

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

# Attachment 1



# Attachment 2



**Mine Layout – Alpha Coal Project**

**HANCOCK PROSPECTING PTY LTD**

# Attachment 3

