



Fitzroy Terminal Project

Terms of reference for an environmental impact statement

May 2012

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Introduction

This document sets out the matters to be addressed in an environmental impact statement (EIS) for the proposed Fitzroy Terminal Project (the project). The project components include:

- a 13-kilometre (km) rail spur, connecting to the rail networks of Blackwater and Moura, enabling trains to access the Raglan Creek site
- a rail unloading facility, stockyards, covered conveyor and barge loading terminal on Port Alma tidal channel
- barging and transshipping operations
- associated power and water infrastructure.

The project proponent is Terminal Project Pty Ltd (the proponent).

This document is divided into three parts:

- (1) Part A—About the project
- (2) Part B—Contents of the EIS
- (3) Part C—How to comment on the TOR.

The draft terms of reference (TOR) must be read in conjunction with *Preparing an environmental impact statement: Guideline for proponents*, which explain:

- the target audience for the EIS
- stakeholder consultation requirements
- document format
- copy requirements.

The guideline is available from www.projects.industry.qld.gov.au or from the EIS project manager (refer to Part A, Section 4 for contact details).

Part A. About the project

1. Project summary

The Fitzroy Terminal Project proposes a means of exporting coal utilising barges and transshipping technology. The proponent advises that this method offers a way to export dry goods directly onto large export vessels without major port structures or significant dredging.

Located approximately 50 km south-east of Rockhampton and 40 km north-west of Gladstone in Central Queensland, the intent of the project is to help alleviate bottlenecks at Queensland ports. The proposal is to export around 10 million tonnes per annum (Mtpa) of coal initially (Stage 1) and up to approximately 22 Mtpa by Stage 2 at a capital cost between \$800 million and \$1.2 billion.

It is expected that the project would employ approximately 380 people during construction and 150 people during operation.

It would transport coal from the existing Blackwater and Moura rail networks via a 13 km rail spur within the multi-user proposed rail corridor spur off the North Coast Line (NCL) on rural land.

The coal would be stockpiled on a site adjacent to Xstrata's proposed Balaclava Island Coal Export Terminal (BICET) project stockyard (projects are independent of each other). Coal would then be transferred via a three km covered conveyor through a barge loading facility on Raglan Creek (within port limits) onto covered barges. The barges would then move into deeper water on the north side of Curtis Island to transshippers, where the coal would be transferred onto large export vessels.

Further information on the project can be viewed at:

www.deedi.qld.gov.au/cg/fitzroy-terminal.html

Or the proponent's website:

www.mitchellgroup.net/main-menu/ports/fitzroy-terminal

2. Project proponent

Fitzroy Terminal Project Pty Ltd (the proponent), was formed in 2010 as a special purpose company for the development of the project. The proponent is a consortium of The Mitchell Group (51 per cent) and other private Australian investors (49 per cent).

The proponent consortium has experience in mining exploration drilling and major project development throughout Australia and South-East Asia.

The contact details for the proponent are:

Ben King
Director, Project Manager
Fitzroy Terminal Project Pty Ltd
PO Box 3119
Darra QLD 4073
email: b.king@mitchellgroup.net
phone: 07 3722 7200
fax: 07 3722 7255
ACN 129 731 997

3. Legislative framework

On 31 October 2011, the then Coordinator-General declared the project to be a 'significant project' under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act). This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires the proponent to prepare an EIS for the project.

On 5 September 2011, the Australian Government Environment Minister determined that the project is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act), due to the likely potential impacts on matters of national environmental significance (MNES) (EPBC 2011/6069). The controlling provisions under the EPBC Act are:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15b and 15C)
- wetlands of international importance (sections 16 and 17B)
- listed threatened species and communities (sections 18 and 18B)
- listed migratory species (sections 20 and 20A)
- Commonwealth marine areas (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C).

The project will therefore require approval from both the Queensland and Australian governments, before it can proceed.

The Australian Government assessment, in accordance with guidelines prepared under the EPBC Act, will occur as a coordinated parallel with the state-based assessment and will be administered separately from the state process by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

The Coordinator-General has invited relevant state and local government representatives, and other relevant authorities, to participate in the process as advisory agencies.

The first step in the Queensland state impact assessment process is to develop TOR for the EIS for the project. The process involves formulating draft TOR and making

them available for public and advisory agency comment. In finalising the TOR, the Coordinator-General will consider all written comments on the draft TOR and present copies of the comments to the proponent.

In accordance with section 32(1) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act), the proponent must provide an EIS that addresses these TOR. The EIS must be acceptable to the Coordinator-General and be provided within two years of these TOR being finalised (unless the Coordinator-General grants an extension in writing, pursuant to section 32(4)(b) of the SDPWO Act).

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

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

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

The Coordinator-General's report will be publicly notified by placing it on the website at <http://projects.industry.qld.gov.au> The report will also be presented to the proponent, the assessment manager under the *Sustainable Planning Act 2009* (SPA) and the Australian Government Minister for the Environment, if relevant.

If the project requires an application for a development approval under SPA, the Coordinator-General's report may, under section 39 of the SDPWO Act, state for the assessment manager one or more of the following:

- the conditions that must attach to the development approval
- that the development approval must be for part only of the development
- that the approval must be a preliminary approval only.

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

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

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

Although the project was determined to be a 'controlled action' under the EPBC Act, the Coordinator-General's report will not be provided to the Australian Government Environment Minister as would be the case for an EIS process conducted under the Bilateral Agreement between the Queensland and Australian governments. As a coordinated parallel impact assessment process applies to this project, DSEWPaC will prepare a separate EIS assessment report addressing MNES matters for the consideration of the Environment Minister or delegate in accordance with the EPBC Act. Consequently, environmental assessments requirements exclusive to the EPBC Act are not included in these TOR.

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

4. Contact details

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

The Coordinator-General

c/o EIS Project Manager—Fitzroy Terminal Project

Significant Projects Coordination

Department of State Development, Infrastructure and Planning

PO Box 15517

City East Qld 4002

tel + 61 7 3224 4449

fax+ 61 7 3225 8282

email fitzroyterminalproject@coordinatorgeneral.qld.gov.au

web <http://projects.industry.qld.gov.au>

Part B. Contents of the EIS

The EIS should follow the format and content outlined in this TOR.

1. Executive summary

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

The executive summary should include:

- project title
- proponent's name and contact details
- a discussion of previous projects undertaken by the proponent, if applicable, and their commitment to effective environmental management
- a concise statement of the aims and objectives of the project
- the legal framework, decision-making authorities and advisory agencies
- an outline of the background and need for the project, including the consequences of not proceeding with the project
- an outline of the alternative options considered and reasons for selecting the proposed development option
- a brief description of the project (pre-construction, construction, operational activities and decommissioning) and the existing environment, using visual aids where appropriate
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies and commitments to minimise the significance of these impacts
- a discussion of the cumulative impacts in relation to social, economic and environmental factors of associated infrastructure projects proposed within the region
- detailed maps of the proposed project location and any other critical figures.

2. Glossary of terms

Provide a glossary of technical terms, acronyms, abbreviations and references.

3. Introduction

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

3.1. Project proponent

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

3.2. Project description

Briefly describe the key elements of the project with illustrations or maps. Summarise any major associated infrastructure requirements.

3.3. Project rationale

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

3.4. Relationship to other projects

Describe how the project relates to other relevant major projects which have an existing approval, or are currently undergoing consideration for approval by government.

As a result of this assessment, there may be opportunities to co-locate existing or proposed infrastructure, enabling efficiency gains and mitigating environmental and property impacts. Where co-location may be likely, outline opportunities to coordinate or enhance impact mitigation strategies. Discuss the opportunities in sufficient detail to enable the reader to understand the reasons for preferring certain options or courses of action and rejecting others.

3.5. Project alternatives

Describe feasible alternatives, including conceptual, technological and locality alternatives to the proposed project and the consequences of not proceeding with the project. Detail the criteria used to determine the alternatives and provide sufficient detail to enable the reader to understand why certain options or courses of action are preferred and why others are rejected (including the 'no action' option). Discuss the interdependencies of the project components, particularly in regard to how any infrastructure requirements relate to the viability of the project.

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

With respect specifically to coal export, demonstrate both why coal proposed to be exported through the Fitzroy Terminal could not be alternatively exported through existing, expanded or new coal export facilities located at or near an existing coal port

(for example, elsewhere in Port Curtis) using conventional coal terminal or barge-transshipping technologies.

3.6. The environmental impact assessment process

3.6.1. Methodology of the EIS

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

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

3.6.2. Objectives of the EIS

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

3.6.3. Submissions

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

3.7. Public consultation process

3.7.1. Overview

The public consultation process 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 (such as newsletters)
- other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation processes (community engagement) for all parts of the EIS should be integrated.

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

3.7.2. Consultation plan

Develop and implement a comprehensive and inclusive consultation plan with the stakeholder groups identified in *Preparing an environmental impact statement: Guideline for proponents* (section 3.2, Audience).

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

- the stakeholders to be targeted
- the types of consultation and communication activities to be undertaken
- timing of activities
- the communication methods that will be used to target the stakeholder and community representatives
- how consultation activities will be integrated with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- reporting and feedback arrangements
- how results of consultation will be considered by the proponent and integrated into the EIS process.

3.7.3. Public consultation report

The EIS must include, as an appendix, a public consultation report detailing how the public consultation plan was implemented, and the results. Specifically, it must include:

- a list of stakeholders identified, including the Australian, Queensland and local government agencies, and other affected parties
- criteria for identifying stakeholders and methods used to communicate with them
- details of the activities conducted to date and the future consultation strategies and programs, including those during the operational phase of the project (also outlined and included in the environmental management plan (EMP)).
- a summary of the issues raised by stakeholders and the means by which the issues have been addressed
- details of how consultation involvement and outcomes were integrated into the EIS process
- details of how consultation outcomes will be integrated into future site activities (including opportunities for engagement and provision for feedback and action if necessary).

3.8. Project approvals

3.8.1. Relevant legislation and approvals

List and describe Australian, state and local government legislation, regulations, policies and approvals relevant to the planning, approval, construction and operation of the project.

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

Australian Government legislation

Relevant Australian Government legislation may include, but is not limited to:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994*
- *Environmental Protection (Sea Dumping) Act 1981*
- EPBC Act
- *Great Barrier Reef Marine Park Act 1975 (GBRMP Act)*
- *Maritime Transport and Offshore Facilities Security Act 2003*
- *Native Title Act 1993*
- *Quarantine Act 1908.*

Australian Government obligations

Identify and outline relevant Australian Government obligations such as:

- protection of World Heritage values
- migratory animals (China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) and Bonn Convention)
- biodiversity (Convention on Biological Diversity)
- climate
- wetlands of international importance (Ramsar)
- ecologically sustainable development (National Strategy for Ecologically Sustainable Development)
- National Assessment Guidelines for Dredging 2009 (incorporates sea dumping (London Protocol)).

Australian Government approvals

Identify and address requirements for Australian Government approvals required under the EPBC Act and other approvals. These may include but are not limited to:

- approval of the proposed action for each of the applicable controlling provisions—under sections 131(1) and 133 of the EPBC Act
- permission for activities in the Great Barrier Reef Marine Park (GBRMP)—under the GBRMP Act)

- permit to dispose of material in Australian waters—under the *Environmental Protection (Sea Dumping) Act 1981*.

Queensland legislation

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

- *Aboriginal Cultural Heritage Act 2003*
- *Building Act 1975*
- *Coastal Protection and Management Act 1995* (Coastal Act)
- *Environmental Protection Act 1994* (EP Act)
- *Explosives Act 1999*
- *Fisheries Act 1994*
- *Land Act 1994*
- *Land Protection (Pest and Stock Route Management) Act 2002*
- *Marine Parks Act 2004*
- *Maritime Safety Queensland Act 2002*
- *Nature Conservation Act 1992* (NC Act)
- *Queensland Heritage Act 1992*
- *State Development and Public Works Organisation Act 1971* (SDPWO Act)
- *Strategic Cropping Land Act 2011* (SCL Act)
- *Sustainable Planning Act 2009* (SPA)
- *Transport Infrastructure Act 1994* (TIA)
- *Transport Operations (Marine Pollution) Act 1995*
- *Transport Operations (Marine Safety) Act 1994*
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Security (Counter Terrorism) Act 2008 and Regulations*
- *Vegetation Management Act 1999* (VM Act)
- *Water Act 2000*.

Queensland approvals

Key Queensland approvals required, and to be addressed by the EIS, may include but are not limited to:

- entitlements to use state land and state resources—*Land Act 1994*
- development approval for tidal works (includes a dredge management plan)—*Coastal Act*
- development approval for operational work within a coastal management district, that is:
 - disposal of dredged spoil or other solid waste material in tidal water—*Coastal Act*
 - reclaiming land under tidal water—*Coastal Act*
 - development permit for tidal works—*Coastal Act*
- allocation of quarry material—*Coastal Act*

- development approval for operational work that is the removal, destruction or damage of a marine plant—Fisheries Act
- development approval for material change of use (MCU) within the Stanwell to Gladstone Infrastructure Corridor State Development Area—SDPWO Act
- development approval for MCU of a premises for an environmentally relevant activity (ERA)—EP Act:
 - ERA 8: Chemical storage 10 cubic metres to 500 cubic metres of chemicals
 - ERA16: Extractive and screening activities (dredging)
 - ERA 17: abrasive blasting
 - ERA 21: motor vehicle workshop
 - ERA 43: concrete batching
 - ERA 50: bulk materials handling involving loading or unloading bulk materials in connection with operations at a port at a rate of 100 tonnes or more a day; and stockpiling bulk materials in connection with operations at a port
 - ERA 57: regulated waste transport—issued to a sub-contractor
 - ERA 63: sewage treatment for 100 to 1500 equivalent persons
- development approval for vegetation clearing—VM Act
- road impact assessment (including transport impact assessment) and road-use management plan for development on land not contiguous to a state-controlled road—TIA
- licence or permit for clearing of native plants or interference with the breeding place of a native animal—NC Act
- water licences and permits for taking or interference with water—Water Act
- potential works in declared fish habitat in Raglan creek—Fisheries Act
- operating a facility for a purpose, mooring (GBRMP Zoning Plan 2003)—Marine Parks Act
- carrying out works including dredging—Marine Parks Act

Identify the relevant approval agency for each approval required.

3.8.2. Relevant plans and policies

Outline the project's consistency with the existing national, state, regional and local planning framework that applies to the project location. Refer to all relevant statutory and non-statutory plans, planning policies, guidelines, strategies and agreements. These include, but are not limited to:

- relevant local government planning schemes
- Central Queensland: A New Millennium (non-statutory regional plan)
- relevant state planning policies
- Queensland Biosecurity Strategy 2009-14
- Queensland Local Industry Participation Policy (2011)
- Queensland Skills Plan
- Queensland Regionalisation Strategy.

With specific reference to maritime safety, or where the project may impact upon infrastructure or operations at Port Alma, the following policies, guidelines and standards should be addressed:

- National Counter-Terrorism Plan (National Counter-Terrorism Committee 2005)
- Critical Infrastructure Protection National Strategy (Trusted Information Security Network 2004)
- Critical Infrastructure Emergency Risk Management and Assurance Handbook (Emergency Management Australia 2004)
- Queensland Counter-Terrorism Strategy 2008–2010 (Department of the Premier and Cabinet 2007)
- Queensland Government Information Security Classification Framework (Department of the Premier and Cabinet 2005)
- Australia/New Zealand AS/NZS ISO 31000:2009 Risk management—Principles and guidelines (Standards Australia & Standards New Zealand 2009)
- Handbook: Security Risk Management (HB 167:2006) (Standards Australia & Standards New Zealand 2006)
- Business Continuity Management (HB 221:2004) (Standards Australia & Standards New Zealand 2004)

3.8.3. Environmentally relevant activities

Briefly describe each environmentally relevant activity (ERA) under the EP Act and associated activities that are to be carried out in connection with the project. Present a detailed description of each ERA in Section 5, (Environmental values and management of impacts); and details of the impact on land, water, air, noise and any other relevant environmental values identified as well as a detailed description of the wastes generated from each ERA and their quantity, characteristics, handling, storage, management and intended treatment or disposal.

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

4. Project description

Describe the project through its lifetime of pre-construction, construction, operation and potentially decommissioning. The project description also allows further assessment of which approvals may be required and how they may be managed through the life of the project.

4.1. Location

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

- location of the project

- location, boundaries and area of current or proposed land tenures that the project area is or will be subject to, and details of the ownership of that land
- location, boundaries and area of the project footprint, including easement widths and access requirements
- location and areas of any proposed buffers surrounding the project area (for construction and operation)
- location of the reported Highest Astronomical Tide (HAT) in relation to all terrestrial works, and structures in relation to declared Fitzroy River Fish Habitat Area
- location of infrastructure relevant to the project, including but not limited to, the state-controlled road network, local roads and railways and marine infrastructure (such as navigational aids)
- location of natural features such as waterways (including rivers, streams, creeks, other water bodies and wetlands), shorelines and navigation channels
- location of any proposed site offices and workforce accommodation site (temporary and/or permanent)
- views to and from the coal stockpile, barge terminal, and transhipper locations, especially from significant areas such as Emu Park and the northern end of Curtis Island.

4.2. Construction

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

4.2.1. Pre-construction activities

Describe all pre-construction activities, including:

- approvals required for this stage
- land acquisitions and land tenures (for example, leases, permits-to-occupy and easements)
- nature, extent and timing of vegetation clearing
- access to all construction sites
- earthworks
- interference with watercourses, floodplain intertidal areas and wetlands
- site establishment requirements for construction facilities, including access measures, movement of materials and equipment and expected size, source and management of the construction workforce accommodation, services (including water, sewerage, communication, energy, waste disposal, recreation) and safety requirements
- temporary works
- upgrade, relocation, realignment, deviation of or restricted access to roads and other infrastructure
- equipment to be used.

4.2.2. Program of works

Describe all the construction elements of the project, including:

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

Where night time construction works are proposed within the vicinity of any sensitive receptors (for example, residences), explain the circumstances under which night time works would be required and the anticipated duration of those works.

4.2.3. Dredging and disposal

Describe and map the location, area and volume of dredging required, differentiating capital from historical or current dredge areas. Provide maps and map overlays indicating areas that have been disturbed and those areas that have not been disturbed historically.

Provide details of the grading and composition of likely dredged materials, including potential contaminants and/or indurated (hardened or cemented) layers and the methods and sites for disposal via land or sea.

Identify if any channel deepening works may necessitate any blasting activity through rock or indurated materials. Where blasting of this material may be required, describe the scale frequency and duration of the blasting and proposed management measures.

Describe proposed disposal methods and locations, including any off-shore options for disposing of maintenance dredge spoil of possibly varying constituencies to be designated dredge spoil disposal and/or rehandling areas.

Quantify the expected amount of maintenance dredging required, the expected frequency of maintenance dredging and the expected composition of dredged material.

Describe provisions for maintenance dredging in the event of a major cyclone, flood or other extreme conditions.

4.2.4. Structures

Describe all structures, including:

- locations and dimensions of buildings and marine infrastructure associated with the development
- the likely interface of the development with future road and rail infrastructure
- the likely construction methodologies
- earthworks, including fill that may need to be imported to the project site

- pollution control methods that will be used to prevent pollution entering marine areas during the construction
- temporary infrastructure to be used for any pre-assembled modules or pre-fabricated units
- modifications that may be needed to accommodate climate change and sea level rise.

Provide maps and figures detailing where permanent or temporary loss of tidal land is likely to occur as a result of buildings and structures.

4.2.5. Commissioning

Describe the commissioning process including the associated environmental impacts and any monitoring and approval requirements unique to the commissioning processes.

4.3. Associated Infrastructure

Detail, with the aid of concept and layout plans, requirements for the new infrastructure or upgrading and/or relocating existing infrastructure to service the project. Consider infrastructure such as transportation, water supply, power supply, telecommunications, stormwater, waste disposal and sewerage.

Explain the design and construction standards to be met (for example, waterway crossings should be designed to meet the requirements of the Fisheries Act and in consultation with Department of Agriculture, Fisheries and Forestry (DAFF)).

4.3.1. Road transport

Provide information on road transportation requirements on local and state-controlled roads for both construction and operations phases, including:

- any proposed new roads to provide access to or within project site
- existing traffic levels, vehicle types and numbers, and trip lengths for roads surrounding the access points to project site
- construction traffic, including vehicle types, oversize loads and number of vehicles
- operational traffic, including vehicle types and numbers, across various stages of development
- anticipated times at which movements may occur
- proposed transport routes (including any waterway crossings)
- need for increased road and intersection maintenance and upgrading, including any waterway crossings
- methods of communicating these issues to the public.

More detailed information regarding transport infrastructure will be required in accordance with others sections of this TOR. The EIS should include cross-references between the sections as appropriate.

4.3.2. Rail transport

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

- the proposed new railway components, including easements and ownership arrangements
- analysis and design plans for any interface with the Blackwater and Moura systems, in consultation with the Department of Transport and Main Roads (DTMR), relevant railway managers, and rail operators.
- proposed transport routes of all project-related transport movements associated with rail (including associated infrastructure such as railway crossings)
- need for increased rail crossing maintenance and upgrading, in consultation with DTMR, relevant railway managers and rail operators)
- all rail infrastructure required to be constructed, upgraded, relocated, commissioned or decommissioned for the construction and/or operation of the project, including the design and construction standards to be met. Rail crossings should be designed to meet Queensland Rail's requirements.

More detailed information regarding transport infrastructure will be required in accordance with others sections of this TOR. The EIS should include cross-references between the sections as appropriate.

4.3.3. Barge loading facilities

Provide concept and layout plans, highlighting proposed structures, plant and equipment associated with construction and operation of the proposed Fitzroy Terminal barge loading facilities. The description of the barge loading facilities should include but is not limited to:

- port boundaries
- port explosives limits
- jetty and wharf alignment
- barge ramps
- barge loading equipment
- berths for barges and transhippers and any other non-bulk carrier vessels
- barge and transhipper numbers, size, frequency, speed and route through designated shipping channels
- location of navigational aids
- ship-sourced waste reception facilities
- any other associated facilities.

4.3.4. Energy

Describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the project.

Detail the location, design and capacity of power generation and transmission infrastructure for construction and ongoing use. The locations of any easements must be shown on the infrastructure plan.

Briefly describe energy conservation measures in the context of any relevant Australian, Queensland and local government policies.

4.3.5. Water supply and storage

Provide information on the proposed water usage by the project, including:

- water supply design
- the ultimate supply and sources of this supply required to meet the demand for full occupancy of the development
- the quality and quantity of all water supplied to the site during the construction phase based on minimum yield scenarios for water re-use, rainwater re-use and bore water volumes
- a water balance analysis
- water storage details (potable and stormwater)
- firefighting flows required
- a site plan outlining actions to be taken if the main water supply fails
- any recycling of treated waste water.

For any approvals required under the Water Act, report on proposed sources of either allocated or independent water supply to address project requirements (both during construction and for the life of the project operationally) that do not counteract current water allocations and supply demands in the region. This is to include demonstrating an adequate water balance assessment for the project (for example, during all stages of development and ongoing use, including reasonable predicted low rainfall).

Provide estimated rates of supply from each source (average and maximum rates) and describe proposed water conservation and management measures.

Describe how the project would adhere to the National Water Quality Management Strategy (NWQMS—see www.environment.gov.au/water/policy-programs/nwqms). Provide information on how water quality will be managed in accordance with relevant NWQMS guidelines, including:

- *Australian Drinking Water Guidelines* (National Health and Medical Research Council & National Resource Management Ministerial Council 2004)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000b)
- *Australian Guidelines for Water Quality Monitoring and Reporting* (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000a)
- *Guidelines for Groundwater Protection* (Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment Conservation Council 1995)

- the National Guidelines for Sewerage Systems Guidelines series (available from www.environment.gov.au/water/policy-programs/nwqms/#guidelines)
- the water recycling guidelines series (available from www.ephc.gov.au/taxonomy/term/39)
- relevant state and local water quality policies.

Determine potable water demand for the project, including the temporary demands during the construction period. Include details of any water supply to meet such requirements. Describe any proposed on-site water storage and treatment for use by the site workforce during construction and operational phases.

Where water supplies require on-site treatment, provide details of any infrastructure used for treatment and how and where any contaminated water (if any is generated) will be disposed of.

Where temporary water supply and treatment infrastructure is required, provide details on requirements and timing.

Describe how the development will manage operation of the water supply system in circumstances of disaster or disruption to power supplies.

4.3.6. Stormwater drainage systems

Detail the sources of stormwater and the quantity, quality and location of discharge to watercourses and the marine environment (including the GBRMP).

Discuss the potential impacts of stormwater discharge to water quality and its associated impacts on species, and describe mitigation measures to reduce the potential impacts.

Describe the proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services. Provide details on the standard of proposed stormwater treatment systems, including examples of quality improvement devices (sediment removal, gross pollutant traps) and potential discharge points (spread of flow and scour protection).

Provide information on how water quality will be managed in accordance with the relevant NWQMS guidelines, *Water Quality Guidelines for the Great Barrier Reef Marine Park* (Great Barrier Reef Marine Park Authority 2010) and state and local policies and guidelines.

4.3.7. Telecommunications

Describe any potential impacts on existing infrastructure (such as optical cables and microwave towers), identifying and consulting with infrastructure owners regarding any proposed impacts.

4.3.8. Other infrastructure

Describe all other infrastructure (including any temporary and permanent on-site accommodation facilities) that need to be constructed, upgraded, relocated, commissioned or decommissioned for the construction and/or operation of the project.

Discuss alternative approaches or the opportunity of obtaining materials from alternative sources.

4.4. Operation

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

- nature and description of all key operational activities
- estimated numbers and roles of persons to be employed during the operational phase of the project
- a description of the plant and equipment to be employed, including the capacity of the project equipment and operations
- maintenance dredging and requirements
- a description of arrangements for long-term maintenance of the marine facilities, including details of the responsible parties
- details requirements of vessel operations, including tugs, pilotage, channel closures, quarantine and security arrangements
- opportunities for future expansion.

In particular, describe the operations of the transhippers.

4.4.1. Product handling

Describe and show on plans at an appropriate scale the proposed methods and facilities to be used for storing coal and for transferring coal from the rail spur to the proposed stockpile, from the stockpile to barges, and from barges to export ships. Include particular detail about the transshipping operations. Discuss any environmental design features of these facilities including:

- the possibility of coal spillage during the ship loading and conveying and the feasibility and relative effectiveness of complete coverage of conveyers compared with other dust control methods
- a description of any coal dust suppression facilities, equipment, chemicals and procedures to be employed during operation
- the nature, sources, location and quantities of all materials to be handled, including storage and stockpiling of coal and managements of potential impacts of product handling
- the identification and quantification of hazards and risks where possible, including cumulative impacts and how these hazards and risks will be managed according to best practice should be articulated
- the method and location of barge, transhipper and coal ship mooring or anchor arrangements during coal transfer events, especially with respect to operator safety during extreme weather events and potential direct mechanical damage impacts on the seabed from anchoring and mooring activities.

4.4.2. Waste management

Detail the proposed management of solid and liquid wastes including quarantine wastes from shipping, considering the suitability of available waste disposal options.

Particular attention must be given to the capacity of wastes to generate acidic, saline or sodic conditions.

Describe the sewerage infrastructure required by the project, including:

- options assessed for wastewater treatment
- the treatment measures of any wastewater generated on the site, whether temporary or not, that will be discharged to council sewerage infrastructure so that the sewage will not adversely impact on treatment processes at council's wastewater treatment plants
- measures required to mitigate any risks to the environment from discharges and overflows, with reference to relevant NWQMS guidelines and other state and local water quality policies and guidance
- buffers between disposal and irrigation areas and other use areas, that is, current rural operations of landholders surrounding the proposed rail corridor
- peak design capacity evaluation of the wastewater treatment system and associated infrastructure using equivalent persons as the measure of capacity
- the proposed disposal and/or re-use of the treated effluent and the management of such use. An irrigation plan should be provided detailing where the use of treated effluent is likely. Details of the likely impacts of treated effluent on groundwater quality should also be provided
- the maintenance regime for the system
- how the development will manage operation of the wastewater treatment and disposal system in circumstances of disaster or disruption to power supplies, including determination of the potential emergency effluent storage that would be required in an extended rain event (one in 50 and one in 100-year) wet weather storage accounting for climate change.

Address any statutory requirements in relation to ship-sourced pollutants under the *Transport Operations (Marine Pollution) Act 1995* with particular regard to sewage, garbage and oily waste (see TOR section 5.9.2).

4.5. Decommissioning and rehabilitation

Present a plan for decommissioning and rehabilitation of the site.

5. Environmental values and management of impacts

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

The objectives of the following subsections are to:

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

Where negative impacts of the project cannot be avoided or adequately minimised or mitigated, present proposals to offset impacts in accordance with the Queensland Government Environmental Offsets Policy (Environmental Protection Agency 2008b).

The EIS should follow the format and content outlined in these TOR; however, changes to the structure can be discussed with the EIS project manager. The mitigation measures, monitoring programs, identified in this section of the EIS should be used to develop the EMP for the project. Refer to Part B, Section 10.

5.1. Climate, natural hazards and climate change

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

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

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

- a risk assessment of changing climate patterns that may affect the viability and environmental management of the project
- the preferred and alternative adaptation strategies to be implemented
- commitments to undertaking, where practicable, a cooperative approach with government, other industry and other sectors to address adaptation to climate change.

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.

5.1.1. Flood plain management

Provide a flood study which includes, but is not limited to:

- addressing the requirements of State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Department of Local Government and Planning and Department of Emergency Services 2003)
- addressing the requirements of the *Queensland Coastal Plan* (Department of Environment and Resource Management 20121c), including the State Planning Policy: Coastal Protection (Department of Environment and Resource Management 2011cd) and the State Policy: Coastal Management (Department of Environment and Resource Management 2011de)
- the susceptibility of the all project sites and project infrastructure to flooding
- quantification of flood impacts on properties surrounding and external to the project site from redirection or concentration of flows
- identification of likely increased flood levels, increased flow velocities or increased time of flood inundation as a result of the development.

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

5.2. Land

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

5.2.1. Scenic amenity

Description of environmental values

Outline the existing landscape features, panoramas and views that have, or could be expected to have, value to the community. Include information such as maps and photographs, particularly where addressing the following issues:

- major views, view sheds, outlooks, and features contributing to the amenity of the area, including assessment from private residences
- focal points, landmarks, waterways and other features contributing to the visual quality of the area and the project sites
- character of the local and surrounding areas including vegetation and land use
- the relative importance of views of proposed project areas, including the coal stockpile area, from relevant parts of Keppel Bay.

Include any relevant World Heritage and National Heritage values of the area, including the values of the Great Barrier Reef.

Potential impacts and mitigation measures

Describe the potential beneficial and adverse impacts of the project on landscape character and visual qualities of the site and the surrounding area. Explain what measures will be undertaken to mitigate or avoid the identified impacts.

5.2.2. Lighting

Description of environmental values

Describe, in general terms, the existing lighting conditions of the area and the general impression that would be obtained while travelling through and around it.

Potential impacts and mitigation measures

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

- the visual impact at night
- night operations and 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.

Ensure that these matters are considered with respect to turtle management, especially with respect to potential impact on Peak Island and northern Curtis Island turtle populations.

5.2.3. Topography, geology and soils

Description of environmental values

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

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

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

Identify any areas of land within the project study area identified as 'strategic cropping land or potential strategic cropping land' (SCL) within the management area defined by the *Strategic Cropping Land Act 2011* (Qld) (SCL Act) trigger maps (see www.derm.qld.gov.au/land/planning/strategic-cropping/mapping.html).

Describe the onshore and offshore potential for acid sulfate soils in accordance with:

- Queensland Acid Sulfate Soils Investigation Team (QASSIT) guidelines (refer to: www.derm.qld.gov.au/land/ass/products.html)
- Queensland Acid Sulfate Soils Technical Manual (Dear, et al. in Department of Natural Resources and Mines 2002) or later versions
- State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002a)
- *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* (Department of Natural Resources and Mines & Department of Local Government and Planning 2002b).

Describe, map and illustrate soil types and profiles according to the *Australian Soil and Land Survey Field Handbook* (National Committee on Soil and Terrain 2009), *Guidelines for Surveying Soil and Land Resources* (McKenzie et al. 2008) and *Australian Soil Classification* (Isbell & CSIRO 2002).

Undertake an appraisal of the depth and quality of useable soil. Describe each soil's agricultural land suitability in accordance with:

- *Guidelines for agricultural land evaluation in Queensland* (Department of Primary Industries 1990)
- *Planning guidelines: The identification of Good Quality Agricultural Land* (Department of Primary Industries & Department of Housing, Local Government and Planning 1993)
- State Planning Policy 1/92: Development and the Conservation of Agricultural Land (Department of Primary Industries & Department of Housing, Local Government and Planning 1992).
- relevant coastal geomorphology.

Undertake soil tests and laboratory analyses of representative samples down the soil profile, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land. Provide geotechnical information on the soils' stability and suitability for construction of project facilities.

Potential impacts and mitigation measures

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

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

Identify the possible soil erosion rate for all permanent and temporary landforms and describe the techniques used to manage the impact. Include an assessment of likely erosion effects, especially those resulting from removing vegetation, and constructing retaining walls both on-site and off-site for all disturbed areas.

Identify any areas within the project footprint likely to temporarily or permanently impact SCL. Where areas of identified SCL are likely to be permanently alienated by the project, the proponent should discuss with Department of Natural Resources and Mines (DNRM) undertaking the SCL validation process defined by the SCL Act.

Identify all soil types and outline the erosion potential (both wind and water) and erosion management techniques to be used. Provide details of an erosion monitoring program (including rehabilitation measures for erosion problems identified during construction), and detail acceptable mitigation strategies.

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

- the *Soil Erosion and Sediment Control—Engineering Guidelines for Queensland Construction Sites* (Institution of Engineers Australia 1996)
- the *Guideline: Urban Stormwater Quality Planning Guidelines* (Department of Environment and Resource Management 2010)
- preventing soil loss in order to maintain land capability and suitability
- preventing degradation of local waterways.

Should action criteria be triggered by acid generating potential as a result of testing, outline management measures in an acid sulfate soils management plan prepared in accordance with:

- the requirements of State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002)
- *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* (Department of Natural Resources and Mines & Department of Local Government and Planning 2002)
- Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines (Dear et al 2002).

For activities that may disturb acid sulfate soils, also propose management measures that would prevent the contamination of groundwater or surface water.

5.2.4. Land contamination

Description of environmental values

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. Include:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the EP Act
- identification of any potentially contaminated sites not on the registers whether or not remediation is required

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

Describe the possible contamination of land from aspects of the project, including waste, reject coal, overburden, coal washing plant and spills at chemical and fuel storage and handling areas; identify and describe all potential issues.

Potential impacts and mitigation measures

Discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (Department of Environment 1998) and the National Environment Protection (Assessment of Site Contamination) Measure 1999 (Cwlth).

Describe strategies and methods to be used to prevent and manage any land contamination resulting from the project, including the management of any acid generation or management of chemicals and fuels to prevent spills or leaks.

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

5.2.5. Land use and tenure

Description of environmental situation

Identify, with the aid of maps:

- land tenures, noting tenures of special interest such as protected areas and reserves, easements, existing and proposed power, water, gas, road and rail infrastructure, explosives port limits
- existing land uses and facilities surrounding the project
- location of the project from residential and recreational areas
- declared water storage catchments
- location of the project in relation to environmentally sensitive areas.

Potential impacts and mitigation measures

Describe the potential changes to existing and potential land uses due to the construction and operation of the project. In particular, describe the following:

- impacts on project site and adjacent land uses and human activities and strategies for mitigation, such as those required by:
 - State Planning Policy 1/92: Development and the Conservation of Agricultural land (Department of Housing, Local Government and Planning & Department of Primary Industries 1992) and *Planning guidelines: The identification of good quality agricultural land* (Department of Primary Industries & Department of Housing, Local Government and Planning 1993)
 - State Planning Policy 1/12: Protection of Queensland's Strategic Cropping Land (Department of Environment and Resource Management 2010), including, if the land occurs within the 'management area' defined by the SCL Act trigger maps, a description of crop rotations grown on the land (if any)

- State Planning Policy 2/07: Protection of Extractive Resources (Department of Mines and Energy 2007a) and *State Planning Policy 2/07 Guideline: Protection of Extractive Resources* (Department of Mines and Energy 2007b), especially with respect to ‘key resource areas’ defined by that guideline
- local government planning schemes
- Stanwell to Gladstone Infrastructure Corridor State Development Area Development Scheme, including pipeline survey and pipeline licences
- possible effect on town planning and port planning objectives and controls, including local government zoning and strategic plans, and port authority zoning and development guidelines
- constraints to potential developments and possibilities of rezoning adjacent to the development area (for example, due to adjacent explosives port limits under the *Explosives Act 1999*)
- management of the immediate environs of the project including construction and transport corridor buffer zones
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services
- any land units requiring specific management measures and the nature of those management measures.

5.3. Nature conservation

Detail the existing nature conservation values that may be affected by the proposal. Describe the environmental values in terms of:

- biological diversity, including state listed species
- integrity of ecological processes,
- habitats of endangered, vulnerable, near-threatened and migratory species
- aquatic and terrestrial ecosystems
- conservation of resources.

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

Wherever possible, involve the local Indigenous community in conducting field observations and survey activities to identify the traditional and contemporary Indigenous uses of species.

Outline the proposed strategies to avoid, or minimise and mitigate, impacts on the identified values within the project’s footprint.

Identify key flora and fauna indicators for ongoing monitoring.

5.3.1. Sensitive environmental areas

Description of environmental values

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

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

- important habitats of species listed under the NC Act as presumed extinct, endangered, vulnerable or near threatened
- regional ecosystems listed as 'endangered' or 'of concern' under state legislation
- good representative examples of remnant regional ecosystems or regional ecosystems that are described as having 'medium' or 'low' representation in the protected area estate as defined in the Regional Ecosystem Description Database (REDD) available at: www.derm.qld.gov.au
- sites containing near-threatened or bio-regionally significant species or essential, viable habitat for near-threatened or bio-regionally significant species
- sites adjacent to nesting beaches, feeding, resting or calving areas (for marine turtles, dugongs and cetaceans)
- sites containing common species that represent a distributional limit and are of scientific value or that contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance
- areas which are important or potentially important as migratory corridors or for population connectivity
- sites of high biodiversity that are of a suitable size or with connectivity to corridors and protected areas to ensure survival in the longer term; such land may contain:
 - natural vegetation in good condition or other habitat in good condition (for example, wetlands)
 - degraded vegetation or other habitats that still support high levels of biodiversity or act as an important corridor for maintaining high levels of biodiversity in the area
- a site containing other special ecological values (for example, high habitat diversity and areas of high endemism)
- ecosystems that provide important ecological functions such as:
 - wetlands of national, state and regional significance
 - coral reefs
 - riparian vegetation
 - important buffer to a protected area or important habitat corridor between areas
- declared fish habitat areas and sites containing protected marine plants under the Fisheries Act

- sites of palaeontologic significance such as fossil sites
- sites of geomorphological significance
- protected areas that have been proclaimed under the NC Act and *Marine Parks Act 2004* (Qld) or are under consideration for proclamation
- declared areas of major interest or critical habitat declared under the NC Act.
- declared areas of high nature conservation value areas or areas vulnerable to land degradation under the VM Act.

Areas of special sensitivity include the marine environment and wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species.

Potential impacts and mitigation measures

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

Demonstrate how the project would comply with the following hierarchy:

- avoiding impact on areas of remnant vegetation and other areas of conservation value including the habitat of listed species
- mitigating impacts through rehabilitation and restoration including, where relevant, a discussion of any relevant previous experience or trials of the proposed rehabilitation
- replacing or offsetting the loss of conservation values, where impacts cannot be avoided or mitigated.

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

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

Describe strategies for protecting Ramsar wetlands and discuss any obligations imposed by state or Commonwealth legislation or policy, or international treaty obligations (that is, JAMBA, CAMBA and ROKAMBA).

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

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

Where relevant, this section should discuss environmental offset requirements in accordance with the Queensland Government Environmental Offsets Policy (Environmental Protection Agency 2008b) and take into account the applicable specific-issue offset policies, as follows:

- State Policy for Vegetation Management (Department of Environment and Resource Management 2009b)

- Queensland Biodiversity Offset Policy (Department of Environment and Resource Management 2011a)
- Policy for Vegetation Management Offsets (Department of Environment and Resource Management 2011b)
- Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss (Department of Primary Industries 2002)
- Queensland Coastal Plan (SPP Coastal Protection).

Describe any departure from no net loss of ecological values.

5.3.2. Terrestrial flora

Description of environmental values

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

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

- location and extent of vegetation types using the regional ecosystem type descriptions in accordance with the REDD
- location of vegetation types of conservation significance based on regional ecosystem types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 1994 (Qld) and subsequent amendments, as well as areas subject to the VM Act
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges and conservation reserves under the NC Act)
- any plant communities of cultural, commercial or recreational significance
- the location of any horticultural crops in the vicinity of the project area
- location and abundance of any known exotic or weed species.

Highlight sensitive or important vegetation types, including riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

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

- the relevant regional vegetation management codes

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database
- the minimum site size should be 10 × 50 metres
- a complete list of species present at each site should be recorded
- the surveys to include species structure, assemblage, diversity and abundance
- the relative abundance of plant species present to be recorded
- any plant species of conservation, cultural, commercial or recreational significance to be identified
- specimens of species listed as protected plants under the Nature Conservation (Wildlife) Regulation, other than common species, are to be submitted to the Queensland Herbarium for identification.

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

Potential impacts and mitigation measures

Describe the potential environmental impacts to the ecological values of the study area arising from the construction, operation and decommissioning of the project including clearing, salvaging or removing vegetation. Discuss the indirect effects on remaining vegetation. Consider short- and long-term effects and comment on whether the impacts are reversible or irreversible.

With regard to all components of the project, include:

- any management actions to minimise vegetation disturbance and clearance
- a discussion of the ability of identified vegetation to withstand any increased pressure resulting from the project and any measures proposed to mitigate potential impacts
- a description of the methods to ensure rapid rehabilitation of disturbed areas following construction, including the species chosen for revegetation, which should be consistent with the surrounding associations
- details of any post-construction monitoring programs
- a discussion of the potential environmental harm on flora due to any alterations to the local surface and groundwater environment with specific reference to impacts on riparian vegetation or other sensitive vegetation communities.

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

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

5.3.3. Terrestrial fauna

Description of environmental values

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

- species diversity (that is, a species list) and abundance of animals of recognised significance
- any species that are poorly known but suspected of being rare or threatened
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- the existence of feral or introduced animals including those of economic or conservation significance
- existence (actual or likely) of any species and communities of conservation significance in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (for example, any requirements of protected area management plans)
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- an estimate of commonness or rarity for the listed or otherwise significant species
- use of the area by waterbirds and migratory fauna including birds
- the existence of feral or introduced animals including those of economic or conservation significance.

Identify any species listed by the EPBC Act and the NC Act occurring in the project area. Identify any species listed by the Department of National Parks, Recreation, Sport and Racing (DNPRSR) 'Back on Track' species prioritisation methodology (refer to www.derm.qld.gov.au/wildlife-ecosystems/wildlife/back_on_track_species_prioritisation_framework/index.html).

Indicate how well any affected communities are represented and protected elsewhere in the bioregion where the project occurs.

Specify the methodology used for fauna surveys. Provide relevant site data to DNPRSR in a format compatible with the Wildlife Online database for listed threatened species (refer to www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online/index.html).

Potential impacts and mitigation measures

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

- impacts due to loss of range, habitat, food supply, nest sites, breeding or recruiting potential, or movement corridors or as a result of hydrological change
- impacts on native species, particularly species of conservation significance

- cumulative effects of direct and indirect impacts
- threatening processes leading to progressive loss.

Address any actions of the project or likely impacts that require an authority under the NC Act.

Provide the following information on mitigation strategies:

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

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

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

5.3.4. Aquatic ecology

Description of environmental values

Describe the aquatic flora and fauna present, or likely to be present, in the study areas affected by the project, noting the patterns and distribution in the waterways and any associated wetlands. Include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area and any associated wetlands
- any rare or threatened aquatic and marine species
- a description of the habitat requirements and the sensitivity of aquatic species to changes in flow regime, water levels and water quality in the project areas
- aquatic plants including native and exotic or weed species
- exotic and pest marine organisms
- aquatic substrate
- habitat downstream of the project or potentially impacted due to currents in associated lacustrine and marine environments
- stream type, including extent of tidal influence and common levels such as highest astronomical tide and mean high water springs.

Describe any wetlands listed by Department of Environment and Heritage Protection (DEHP) as areas of national, state or regional significance and detail their values and importance for aquatic flora and fauna species.

Specific biology requirements

Aquatic flora

Define the nature and extent of existing marine features such as littoral and sub-littoral lands, waterways, affected tidal and sub-tidal lands and marine vegetation (including salt couch, seagrass and mangroves) within the proposed area of development and in the study areas adjacent to the project.

Conduct field assessments for plant species, preferably in the dry season, as follows:

- record site data in a form compatible with the Queensland Herbarium CORVEG database
- record a complete list of species present at each site, including those species defined and protected under the Fisheries Act
- record the relative abundance of plant species present
- identify any plant species of conservation, cultural, commercial or recreational significance
- submit specimens of species listed as protected plants under the Nature Conservation (Wildlife) Regulation (other than common species) to the Queensland Herbarium for identification and entry into the HERBRECS database.

Aquatic fauna

Describe the marine fauna, such as turtles, dugongs, dolphins, whales, sea snakes and rays that may be impacted by the proposed development.

Describe the turtle species that may be using beaches in proximity to the proposed development area. Identify turtle nesting sites within five kilometres of the proposed project area.

Identify any fish spawning grounds located in the area that may be affected by the proposed development in consultation with DAFF (fisheries).

Consult DNPRSR and the Great Barrier Reef Marine Park Authority (GBRMPA) and undertake a review of information on the turtle communities of the study area, paying specific attention to any anecdotal or recorded information on turtle populations frequenting the area and any known nesting sites.

Use this information to establish the basis for recommendations on appropriate management measures to be adopted to minimise the risk of marine fauna injury or death. Particular reference should be given to the protection of marine fauna from boat strike, given the potential increase in boat traffic closer to feeding grounds than the existing port channel.

Benthic macro invertebrates

Benthic macro invertebrate communities likely to be directly or indirectly impacted by the project should be characterised to assess the potential impacts of proposed capital

works. Consider the effect of ongoing maintenance activities, including dredging, on benthic fauna.

Fish habitat

Describe the nature, extent and condition of fish habitats that have the potential to be impacted, with particular reference to fish nursery habitat and spawning grounds. Map the location and density of marine plants at an appropriate scale.

Show the location of any declared fish habitat areas proximate to the proposed development site.

Reef communities

Describe the reef communities that may be impacted by the proposed development.

Potential impacts and mitigation measures

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

- proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that would restrict free movement of aquatic fauna
- measures to avoid fish spawning periods, such as seasonal construction of waterway crossings and measures to facilitate fish movements through water crossings
- alternatives to waterway crossings where possible
- offsets proposed for unavoidable, permanent loss of fisheries habitat
- methods to minimise the potential for introducing or spreading weed species or plant disease
- monitoring aquatic biology health, productivity and biodiversity in areas subject to direct discharge
- measures to be implemented to avoid or minimise ship and coal barge strike and propeller strike during the construction, commissioning and operation of the project

Address any actions of the project or likely impacts that require an authority under the relevant legislation including the NC Act and/or the Fisheries Act.

Provide details of the management methods which would avoid or minimise impacts on, birds, marine mammals, turtles and fish, including migrations and marine plant propagation. In particular, present a discussion of existence (actual or likely) of any species and communities of conservation significance in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (for example, any requirements of protected area management plans or threatened species recovery plans, including, but not restricted to direct reference to all relevant turtle species included in the *Recovery Plan for Marine Turtles in Australia* (Environment Australia 2003).

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

5.4. Water resources

5.4.1. Description of environmental values

Describe the quality and quantity of water resources in the vicinity of the project area, including:

- existing surface and groundwater in terms of physical, chemical and biological characteristics
- existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses
- chemical and physical properties of any wastewater (including stormwater at the point of discharge into natural surface waters), and the toxicity of effluent to flora and fauna.

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

- Environmental Protection (Water) Policy 2009 (EPP (Water))
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000b)
- *Queensland Water Quality Guidelines 2009* (Department of Environment and Resource Management 2009a)
- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- any impoundments (for example, dams, levees and weirs)
- hydrology of waterways and groundwater
- sustainability, including both quality and quantity
- dependent ecosystems
- existing and other potential surface and groundwater users
- water resource plans relevant to the affected catchments.

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

- geology and stratigraphy
- aquifer type—such as confined, unconfined
- depth to and thickness of the aquifers
- depth to water level and seasonal changes in levels
- groundwater flow directions (defined from water level contours)
- interaction with surface water
- possible sources of recharge
- potential exposure to pollution
- current access to groundwater resources in the form of bores, springs and ponds (including quantitative yield of water and locations of access).

The groundwater assessment should also be consistent with relevant guidelines for the assessment of acid sulfate soils including spatial and temporal monitoring to accurately characterise baseline groundwater characteristics.

Groundwater

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

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

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

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

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

5.4.2. Potential impacts and mitigation measures

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

- potential impacts on the flow and the quality of surface and groundwater from all phases of the project, with reference to their suitability for the current and potential downstream uses and discharge licences
- an assessment of all likely impacts on groundwater depletion or recharge regimes
- potential impacts of surface water flow on existing infrastructure, with reference to the EPP (Water) and the Water Act
- any implications of the Water Resource (Fitzroy Basin) Plan 2011 that apply to the project
- chemical and physical properties of any wastewater (including stormwater at the point of discharge into natural surface waters), and the toxicity of effluent to flora and fauna
- potential impacts on other downstream receiving environments, if it is proposed to discharge water to a riverine system

- the results of a risk assessment for uncontrolled releases to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts
- an assessment of the potential to contaminate surface and groundwater resources and measures to prevent, mitigate and remediate such contamination.

Describe the monitoring programs that will assess the effectiveness of management strategies for protecting water resources during the construction, operation and decommissioning of the project.

Surface water and water courses

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

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

Wastewater treatment

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

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

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

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

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

Groundwater

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

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

Assess the impact of the project on the local groundwater regime caused by the altered porosity and permeability of any land disturbance.

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

5.5. Coastal environment

Describe the existing coastal environment that may be affected by the project in the context of coastal values identified in the Queensland State of the Environment reports and environmental values as defined by the EP Act, environmental protection policies and *Queensland Coastal Plan* (including the coastal hazards areas maps and areas of ecological significance maps).

Identify actions associated with the project that are assessable development within the coastal zone and will require assessment under the provisions of the Coastal Act.

Assess the project's consistency with the relevant policies of the *Queensland Coastal Plan*.

Should any shipwreck or article associated with a shipwreck be discovered, the find is to be reported in accordance with the *Historic Shipwrecks Act 1976* (Cwlth).

5.5.1. Hydrodynamics and sedimentation

Description of environmental values

Assess the physical and chemical characteristics of sediments within the littoral and marine zone adjacent to the project area.

Describe the physical processes of coastal environment related to the project including:

- waves
- currents
- tides
- storm surges
- freshwater flows
- the key influencing factors of cyclones and other severe weather events and their interaction in relation to the assimilation and transport of pollutants entering marine waters from, or adjacent to, the project area.

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.

Describe the tidal hydrodynamics of the project area and the adjoining tidal waterways in terms of water levels and current velocities and directions at different tidal states. Undertake two- and/or three-dimensional modelling. Provide details of water levels and flows associated with historical and predicted storm surges.

Describe the wave climate in the vicinity of the project area and the adjacent beaches including inter-annual variability and details of historical and predicted extreme wave conditions generated by tropical cyclones or other severe storm events.

Describe the hydrology of the area and the adjacent catchments of the rivers and the associated freshwater flows within the study area and the adjoining tidal waterways in terms of water levels and discharges. Detail the interaction of freshwater flows with different tidal states, including storm tides. Describe inter-annual variability and details of historical and predicted floods including extent, levels and frequency. Flood studies should include a range of annual exceedence probabilities for affected waterways, where data permits.

Predict the likely changes to hydrodynamics (including water levels, currents, wave conditions and freshwater flows) and sedimentation in the project area due to climate change.

Potential impacts and mitigation measures

Describe the potential changes to the hydrodynamic processes and local sedimentation resulting from the construction and operation of the project. This should include:

- impacts on tidal flows and water levels
- changes to sediment transport patterns, including the potential of the proposal to impact on bank erosion and/or bed degradation within adjacent waterways
- an assessment of the erosive effects of vessel wash and anchorage associated with boat traffic generated by the proposal. This would be supported by a vessel traffic impact assessment to determine the increase of vessels (size and number) that can be expected as a result of the project relative to the existing situation.

This assessment should also discuss the potential impacts associated with extreme events such as storm tide flooding. This must include an assessment of the vulnerability of the project to storm tide flooding and the potential of the project to affect vulnerability to storm tide flooding on adjacent properties.

When assessing the hydrodynamics of the area and movement of sediment along the coast, consider coastal processes such as erosion and accretion at adjacent locations.

5.5.2. Coastal water quality

Description of environmental values

Provide baseline information on water quality of coastal waters. This information should include (but is not necessarily be limited to) general physical chemical water quality parameters such as dissolved oxygen, pH, heavy metals, nutrients, temperature, salinity, suspended solids and turbidity.

For coastal areas potentially affected by sediment run-off or dredging, suspended solids concentration and turbidity should also be included.

Discuss the interaction of freshwater flows with coastal waters and the significance of this in relation to marine flora and fauna adjacent to the project area.

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

- variability associated with the local wind climate, seasonal factors, freshwater flows and extreme events
- values identified in the EPP (Water) 2009.

Describe the existing resources and environmental values of water that may be affected by the project. Environmental values will be defined according to:

- the EP Act
- Environmental Protection (Water) Policy 2009 (EPP (Water))
- the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand 2000b)
- the *Queensland Water Quality Guidelines 2009* (Department of Environment and Resource Management 2009a)
- the guideline *Establishing Draft Environmental Values and Water Quality Objectives* (EPA, 2002).

Develop and describe suitable water quality and resource indicators for measuring environmental values, and objectives that would protect the identified values.

Potential impacts and mitigation measures

Define and describe the water quality objectives and practical measures for protecting, mitigating or enhancing coastal environmental values. This includes how nominated quantitative standards and indicators may be achieved, and how the achievement of the water quality objectives will be monitored, audited and managed.

The potential environmental impacts caused by the project on coastal resources and processes shall be described in the context of controlling such effects. State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002a) should be addressed as should the *Queensland Coastal Plan* (Department of Environment and Resource Management 2012) and the *Fish Habitat Guideline FHG 002—Restoration of fish habitats: fisheries guidelines for marine areas* (Hopkins, White & Clarke 1998).

Specific issues to be addressed include:

- 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 2009* (Department of Environment and Resource Management 2009a) and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000b)

- potential threats to the water quality and sediment quality of the coastal environment within the project footprint, specifically associated with constructing and operating the facilities.

This assessment shall consider, at minimum:

- dredging and dredge material disposal, including disturbance of fine-grained sediments and contaminated material
- potential accidental discharges of contaminants during construction and operation of the marine precinct
- release of contaminants from marine structures and vessels, including potential for introducing marine pests
- stormwater run-off from the marine precinct facilities and associated infrastructure
- flooding of relevant river systems and other extreme events.

5.5.3. Sediment quality and dredging

Provide baseline information on marine sediments and sediment quality in the area likely to be disturbed by dredging or vessel movements including contaminants (such as heavy metals, nutrients and pesticides), the presence of fines and/or indurated layers and acid sulfate potential. Present this information as a map of sediment types based on their physical and chemical properties and include depth profiles.

Where dredging is proposed, assessment of marine sediments should be undertaken in accordance with the *National Assessment Guidelines for Dredging 2009* (NAGD).

Detail specific measures to maintain sediment quality to nominated quantitative standards within the project and surrounding areas, particularly where future maintenance dredging may be required.

Provide comment on the choice of the disposal site in relation to coastal management outcomes, having regard to the nature of the spoil, cost of alternatives and potential impacts on coastal resources and their values.

Describe provisions for dredge material disposal and associated impacts on sediment quality. Discuss disposal options for contaminated material, if required. This must include a description of the arrangements to be put in place for long-term (20 years) dredge material disposal including details of proposed material placement areas.

5.6. Air quality

5.6.1. Description of environmental values

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

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

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

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

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

5.6.2. Potential impacts and mitigation measures

Consider the following air quality issues and their mitigation:

- an inventory of air emissions from the project expected during construction and operational activities
- ‘worst case’ emissions that may occur during operation, in particular coal dust from rail and conveyor operations, port stockpile and handling facilities, barge loading and transhipping. If these emissions are significantly higher than those for normal operations, it will be necessary to separately evaluate the worst-case impact to determine whether:
 - the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate
 - emissions, especially coal dust, may have a significant negative impact on the terrestrial or marine flora or fauna
- ground level predictions should be made at any site that includes the environmental values identified by the EPP (Air), including any sites that could be sensitive to the effects of predicted emissions
- dust and odour generation from construction activities, especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers
- climatic patterns that could affect dust generation and movement
- vehicle emissions and dust generation along major haulage routes both internal and external to the project site
- human health risk associated with emissions from the facility of all hazardous or toxic pollutants

Detail the mitigation measures together with proactive and predictive operational and maintenance strategies that could be used to prevent and mitigate impacts.

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

5.7. Greenhouse gas emissions

5.7.1. Description of environmental situation

Provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO₂ equivalent' terms for the following categories:

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

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

Use the *National Greenhouse Accounts (NGA) Factors* (Department of Climate Change and Energy Efficiency 2010) as a reference source for emission estimates, supplemented by other sources where practicable and appropriate. As a requirement of the NGA factors, estimates should include the loss of carbon sink capacity of vegetation due to clearing and impoundment.

5.7.2. Potential impacts and mitigation measures

Discuss the potential for greenhouse gas abatement measures, including:

- the proposed measures (alternatives and preferred) to avoid and/or minimise direct greenhouse gas emissions
- how the preferred measures minimise emissions and achieve energy efficiency
- any opportunities to further offset greenhouse gas emissions through indirect means including sequestration and carbon trading.

5.8. Noise and vibration

5.8.1. Description of environmental values

Describe the existing noise and vibration environment that may be affected by the project in the context of the environmental values defined by the Environmental Protection (Noise) Policy 2008 (EPP (Noise)). Refer to:

- *Noise Measurement Manual* (Environmental Protection Agency 2000)
- *EPA Guideline Noise and Vibration from Blasting* (Environmental Protection Agency 2006)
- *Guideline: Planning for Noise Control* (Environmental Protection Agency 2004).

Identify sensitive noise receptors adjacent to all project components and estimate typical background noise and vibration levels based on surveys at representative sites. Discuss the potential sensitivity of such receptors and nominate performance indicators and standards.

5.8.2. Potential impacts and mitigation measures

Describe the impacts of noise and vibration generated during the construction and operational phases of the project, with particular attention given to operational rail noise impacts. Noise and vibration impact analysis should include:

- the levels of noise and vibration generated, including noise contours, assessed against current typical background levels, using modelling where appropriate
- impact of noise, including low frequency noise (noise with components below 200 Hz) and vibration at all potentially sensitive receivers compared with the performance indicators and standards nominated above
- impact on terrestrial, avian and aquatic fauna
- proposals to minimise or eliminate these effects, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise and vibration
- options for sensitive receivers that are otherwise unable to achieve a satisfactory internal noise level for the preservation of health and wellbeing as identified within the EPP (Noise).

5.9. Waste

5.9.1. Waste generation

Identify and describe all sources, likely volumes and quality (where applicable) of waste associated with construction, operation and decommissioning of all aspects of the project. Refer to regulated waste listed in Schedule 7 of the Environmental Protection Regulation 2008.

Describe:

- waste generated by delivery of material to sites
- all chemical and mechanical processes conducted on the construction sites that produce waste
- the amount and characteristics of solid and liquid waste produced on site by the project
- hazardous materials to be stored and/or used on site, including environmental toxicity data and biodegradability.

5.9.2. Waste management

Detail the proposed management of solid and liquid wastes, including quarantine wastes from shipping. Assess the potential impact of all wastes generated during construction and operation (including the operation of the barges and transhipper(s), with regard for best practice waste management strategies, the Environmental Protection (Waste) Policy 2000 and the Environmental Protection (Waste) Regulation 2000. Provide details of each waste in terms of:

- the options available for avoidance and minimisation
- operational handling and fate of all wastes including storage

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

5.10. Transport

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

5.10.1. Existing infrastructure

Describe the extent, condition and capacity of the existing transport infrastructure on which the project will depend.

5.10.2. Transport tasks and routes

Describe:

- expected volumes of project inputs and outputs of transported raw materials, wastes, hazardous goods, finished products for all phases of the project
- how identified project inputs and outputs will be moved through the local and regional transport network (volume, mode, composition, trip timing, numbers of trips, sources¹ and routes)
- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- arrangements for workforce transport to and from the project area, including proposed use of regional or charter air services
- likely heavy and oversize or indivisible loads (volume, composition, timing and routes), highlighting any vulnerable bridges and structures along proposed routes.

5.10.3. Potential impacts and mitigation measures

Impact assessment reports should include details of the adopted assessment methodology (for impacts on roads: the road impact assessment report in general accordance with the *Guidelines for Assessment of Road Impacts of Development* (Department of Main Roads 2006)).

¹ Submission issue no. 26.2.6 (DTMR)

Assess project impacts on:

- local and state-controlled road networks, including key road and road/rail intersections, at project construction, operation and decommissioning stages. Any impact to level crossings should be assessed using the Australian Level Crossing Assessment Model (ALCAM)
- capacity, safety, local amenity, efficiency and condition of transport operations, services and assets, from either transport or project operations (with reference, where relevant, to the Queensland Road Safety Action Plan 2010-2011)
- possible interruptions to transport operations
- the natural environment within the jurisdiction of an affected transport authority (for example, road and rail corridors)
- the nature and likelihood of product-spill to both land and marine environments during transport, if relevant
- driver fatigue for workers travelling to and from regional centres and key destinations
- any existing or proposed strategies for public passenger transport and active transport and address, where relevant, requirements of Part 2A of the *Transport Planning and Coordination Act 1994* (Qld)
- access to transport for people with a disability
- any special arrangements that are required to apply to movements of vessels entering Port Alma carrying commercial quantities of explosives
- transport and handling of hazardous substances and dangerous goods.

5.10.4. Infrastructure alterations

Detail:

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

5.10.5. Transport management strategies

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

Findings of studies and transport infrastructure impact assessments should be an input into preparing a transport management plan.

Road/rail management planning

Outline:

- procedures for assessing and agreeing on the scope of required mitigation works with road/rail corridor managers, including any associated works, such as sourcing water and gravel

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

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

Shipping

Consult the Australian Quarantine and Inspection Service (AQIS) regarding details of managing customs and quarantine issues and GPC regarding quarantine management.

Consult the Regional Harbour Master and GPC regarding maritime issues relating to barging and transshipping operations, including maritime safety (see TOR section 8). Describe the navigational arrangements including likely operational limits (with respect to wind strength, and sea state) and cyclone contingency plans for barges and transshippers. The EIS should discuss the results of the consultation.

Describe current and projected vessel use of the port in state waters including their size, shipping movements, anchorages, access to and from the port and navigational arrangements.

Regarding increased shipping volumes, the following should be specifically addressed, in particular with reference to the GBRMP:

- potential for introduction of exotic organisms from increased shipping rates
- ballast water management arrangements—including Australian Quarantine and Inspection Service mandatory arrangements and agency contingency planning
- management of ship waste, in particular quarantine waste, domestic garbage, oil and sewage
- risk of spills and their management
- operational procedures for adverse weather including cyclones
- potential foreshore damage caused by barge and transhipper activities
- potential for increased vessel strike to marine species
- routes of ships in transit through port waters and the aligned infrastructure such as navigational aids.

Liaise with MSQ regarding the development of management plans for vessel traffic management, aids to navigation, and ship-sourced pollution prevention.

Additional marine transport issues that should be considered include the potential of the proposal to impact on commercial fishing and recreational craft.

In the above discussions on shipping, account separately for barge, transhipper and coal ship movements, the interaction of those vessels with each other and vessels (especially ships carrying commercial quantities of fuel or explosives) entering and leaving Port Alma and recreational and commercial fishing boats operating in the area. Describe the probability of negative impacts arising from interactions between those vessels and the management or other measures that are proposed to avoid, minimise or mitigate such potential negative impacts. Include details of number of ships likely to be in demurrage waiting to be loaded (including a worst case scenario) and where the demurrage location will be located.

Describe the measures proposed to be undertaken if shipping incidents occur, especially collisions involving project coal barges and/or transhippers.

Describe the routes to and from international waters that coal ships will take approaching and leaving the transshipping points, especially through or adjacent to the Great Barrier Reef and any potential interactions that these ships may have with other ships entering or leaving Port Curtis.

Air services

Describe the air services and their current capacity serving the region. Estimate the project's requirements for air transport to and from these regions, and the services required to supply these projections. Provide an assessment of the infrastructure needed to support the projected level of air services.

5.11. Indigenous cultural heritage

5.11.1. Description of existing Indigenous cultural heritage values

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

Explain the significance of artefacts, items or places of Indigenous cultural heritage value likely to be affected by the project at a local, regional, state and national level.

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

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

5.11.2. Potential impacts and mitigation measures

To the greatest extent practicable, significant cultural heritage areas should be avoided by the project.

Provide an assessment of any likely impacts of the project on sites of Indigenous cultural heritage value.

Define and describe the objectives and practical measures for protecting or enhancing Indigenous cultural heritage environmental values. Describe how nominated

quantitative standards and indicators may be achieved for cultural heritage management, and describe how the achievement of the objectives will be monitored, assessed and managed.

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

Native title agreement or cultural heritage management plan

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

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

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

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

- a process for including Indigenous people associated with the development areas in protection and management of Indigenous cultural heritage
- processes for mitigating, managing and protecting identified cultural heritage sites and objects in the project areas, including associated infrastructure developments, during both the construction and operational phases of the project
- provisions for managing the accidental discovery of cultural material, including burials
- a clear recording process to assist initial management and recording of accidental discoveries
- a cultural heritage induction for project staff
- developing a cultural heritage awareness program to be incorporated into the contractor and employee manual and induction manual. This is to be in the form of a plain language, short document that is easy for contractors and staff 'on the ground' to understand
- a conflict resolution process.

5.11.3. Native title

Identify areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative bodies,

and whether it is necessary to notify the representative bodies or if there is evidence that native title does not exist.

Identify the potential for native title rights and interests likely to be impacted upon by the project and the potential for managing those impacts by an Indigenous land use agreement or other native title compliance outcomes.

5.12. Non-Indigenous cultural heritage

5.12.1. Description of existing non-Indigenous cultural heritage values

Include a cultural heritage study that describes non-Indigenous cultural heritage sites and places, and their values.

Describe the significance of artefacts, items or places of conservation or non-Indigenous cultural heritage value likely to be affected by the project and their values at a local, regional, state and national level.

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 heritage of the affected areas
- liaison with relevant community groups and organisations (such as local historical societies) concerning:
 - places of non-Indigenous cultural heritage significance
 - opinion regarding significance of any cultural heritage places located or identified
- locations of culturally and historically significant sites, shown on maps, that are likely to be impacted by the project
- a constraints analysis of the proposed development area to identify and record non-Indigenous cultural heritage places.

5.12.2. Potential impacts and mitigation measures

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

Provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhancing any positive impacts.

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

6. Social values and management of impacts

6.1. Description of existing social values

A social impact assessment (SIA) should be conducted in consultation with the DSDIP Social Impact Assessment Unit.

6.1.1. Social and cultural area

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

- potential for social and cultural impacts to occur
- location of other relevant proposals or projects
- location and types of physical and social infrastructure, settlement and land use patterns
- social values that might be affected by the project (including, integrity of social conditions, visual amenity, liveability, social harmony, public health and wellbeing, and sense of community)
- Indigenous social and cultural characteristics, such as native title rights and interests, and cultural heritage.

6.1.2. Community engagement

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

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

Discuss how complaint resolution will be addressed, for all stages of the project.

6.1.3. Social baseline study

Include a targeted baseline study of the people residing in the project's social and cultural area to identify the project's critical social issues, potential adverse and positive social impacts, and strategies and measures developed to address the impacts.

The social baseline study should be based on qualitative, quantitative and participatory methods. It should be supplemented by community engagement processes, and reference relevant data contained in local and state government publications, reports, plans, guidelines and documentation, including regional plans and, where available, community plans.

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

- major population trends and 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 transient population), 18 years and older
- estimates of population growth and population forecasts resulting from the proposal
- family structures
- age and gender distributions
- education, including schooling levels
- health and wellbeing measures
- cultural and ethnic characteristics
- the Indigenous population including age and gender
- income including personal and household
- labour force by occupation and industry
- housing costs (monthly housing repayments (per cent of dwellings in each category), and weekly rent (per cent dwellings in each category), housing tenure type and landlord type, household and family type
- housing availability and affordability: the rental market (size, vacancy rate, seasonal variations, weekly rent by percentage dwellings in each category); the availability and typical costs of housing for purchase, monthly housing repayments by percentage dwellings in each category; 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 as relevant through the community engagement process.

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

- the social infrastructure including community and civic facilities, services and networks (for definition see *South East Queensland Regional Plan 2005–2026: Implementation Guideline No.5: Social infrastructure planning* (Department of Infrastructure 2007))
- 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
 - 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.

6.1.4. Workforce profile

The SIA should include a profile of the workforce that describes the estimated composition of workforce by occupation, project stage and duration (including any planned construction prior to Final Investment Decision) using the template provided at www.skills.qld.gov.au

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.

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

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

6.1.5. Temporary workforce accommodation

If relocatable camp sites are to be used to accommodate the workforce, provide details on the number, size, potential location options, management, proximity to the construction site, and typical facilities for these sites.

Information should outline any local government or other regulatory approvals required to establish and operate such camps, including development approvals, building, health and safety, and waste disposal purposes.

6.2. Potential impacts

Assess and describe the type, level and significance of the 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. Furthermore:

- describe and summarise outcomes of community engagement processes including the likely response of the affected communities, including Indigenous people
- include sufficient data to enable affected local and state authorities to make informed decisions about the project's effect on their business and plan for the provision of social infrastructure in the project's social and cultural area. If the project is likely to result in a significant increase in the population of the area, then the proponent should consult the relevant management units of the state authorities and summarise the results of the consultations
- address direct, indirect and secondary impacts from any existing projects and the proposed project including an assessment of the size, significance, and likelihood of these impacts at the local and regional level. Consider the following:

- key population and 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. Present this information according to occupational groupings of the workforce. Detail whether the proponent, and/or contractors, is likely to employ locally or through other means and whether there are initiatives for local employment business opportunities
- proposed new skills and training related to the project including the occupational skill groups required and potential skill shortages anticipated
- how much service revenue and work from the project would be likely to flow to the project's social and cultural area
- impacts of construction and operational workforces, their families, and associated contractors on housing and accommodation availability and affordability, land use and land availability. Discuss the capability of the existing housing and rental accommodation, to meet any additional demands created by the project, including direct impacts on Indigenous people
- impact of project construction and operation, including additional marine transport, on commercial and recreational boating and fishing.

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

6.2.1. Mitigation measures and management strategies

The 'Major Resource Projects Housing Policy' (DEEDI 2011) sets out the core principles to guide the identification and assessment of accommodation and housing impacts and development of mitigation 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

- demographic changes in the profile of the region and the associated sufficiency of current social infrastructure, particularly health and welfare, education, policing and emergency services
- adequate provision of education, training and employment for women, people with a disability, and Indigenous peoples.

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

Measures proposed to address potential social impacts of the project should address:

- 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
- action plans to implement mitigation strategies and measures
- practical mechanisms to monitor and adjust mitigation strategies and action plans

Further guidance on these matters is available in 'Social impact assessment: Guideline to preparing a social impact management plan' (Department of Infrastructure and Planning 2010).

7. Economic values and management of impacts

7.1. Economy

7.1.1. Description of affected local and regional economies

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

- a map illustrating the local and regional economies (Local Government areas) that could be potentially affected by the project
- gross regional product or other appropriate measure of annual economic production
- population
- labour force statistics
- economic indicators
- the regional economy's key industries and their contribution to regional economic income
- the key regional markets relevant to the project:
 - labour market
 - housing, rental accommodation and land markets

- construction services and building inputs market
- regional competitive advantage and expected future growth.

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

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

7.1.2. Potential impacts and mitigation measures

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

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

- property values
- industry output
- employment
- the indirect impacts likely to flow to other industries and economies from the development of the project. This should also consider the implications of the project for future development
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups.

Strategies for local participation

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

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

These strategies must respond to relevant government policy on the use of locally sourced goods and services, relating to the Local Industry Participation Plan under the Local Industry Policy (Department of Employment, Economic Development and Innovation 2010), and refer to relevant documents at www.industry.qld.gov.au/key-industries/208.htm described in the Local Industry Policy Guidelines (2011) in consultation with the DSDIP Office of Advanced Manufacturing and the Industry Capability Network (refer to <http://www.icnqld.org.au>).

Impact upon property management

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

- impact of the project on existing agricultural land uses and management practices (for example. disruption to stockyards, fences, water points, sowing or harvesting of

crops, movement of livestock, agricultural machinery and any loss of agricultural land)

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

7.2. Sustainable development

Provide a comparative analysis of how the project conforms to the objectives for 'sustainable development'—see the *National Strategy for Ecologically Sustainable Development* (Ecologically Sustainable Development Steering Committee 1992).

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.

8. Hazard and risk

8.1. Hazard and risk assessment

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

- potential hazards, accidents, spillages, fire and abnormal events that may occur during all stages of the project, including possible risk of occurrence
- potential impacts to the operations of Port Alma with the explosives port limits approved under the *Explosives Act 1999*
- all hazardous substances to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards, natural events and implications related to climate change.

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

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

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

In particular, provide details on the management measures required to avoid potential safety and hazard conflict with the operations of Port Alma.

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

In addition, the proponent must undertake a detailed risk assessment of the operational activities to identify risks and mitigation measures to ensure containment within the site boundaries. Any identified risk should address the resultant impact on the surrounding areas and community.

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

As a minimum, this cumulative risk assessment must include operations at Port Alma (including explosives, salt and bulk fuel handling) and Xstrata Coal's proposed Balaclava Island Coal Export Terminal (refer to: www.deedi.qld.gov.au/cg/balaclava-island-coal-export-terminal-bicet.html and www.balaclavaislandcoal.com.au)

Identify and adopt, where appropriate, any changes to operating or storage procedures that would reduce the possibility of these events occurring, or reduce the severity of the events should they occur.

Present draft risk management plans for the construction and operational phases of the project.

Report on any hazards and risks that may arise through interaction with existing port (Port Alma).

8.2. Health and safety

8.2.1. Description of public health and safety community values

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

In particular, describe the scale and nature of the current salt export, explosives and fuel importation programs at Port Alma. Describe current plans to expand the import of explosives and their transport to a potentially expanded explosives storage facility at Bajool. Consult with the Gladstone Ports Corporation, the DNRM Explosives Inspectorate, and relevant regional staff at the Department of Transport and Main Roads and the Qld Police Service and report on the outcomes of that consultation.

Describe the current exclusion buffer distances that apply to explosive handling during the unloading of an explosives ship and any likely changes to those buffer arrangements should current plans to increase explosives import be implemented.

8.2.2. Potential impact and mitigation measures

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

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

Notwithstanding the information requirements specified for the 'Maritime security plan', for both the construction and operation phases of the project, describe any special arrangements that are proposed for coal train unloading, coal stockpile management, coal barge loading and coal barge movements while an explosives vessel is moored at and approaching or leaving Port Alma. Address the need to amend any special management measures should the volume of explosive importation increase as currently proposed.

8.3. Emergency management plans

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

- terrorist attack (refer subsections 8.3.1 and 8.4)
- marine collision minimisation
- fire prevention and protection
- leak detection and minimisation
- release of contaminants
- emergency shutdown systems and procedures
- natural disasters.

In addition, undertake an assessment of businesses that may be affected in the event of an emergency, including strategies to mitigate the impact on these businesses.

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

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

8.3.1. Maritime security plan

Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans, if required). The procedures should cover the range of situations identified in the risk assessment developed in this section, including strategies to deal with natural disasters during operation and construction.

The emergency management plan is to include a maritime security plan that meets Australian Government security requirements pursuant to the requirements of:

- the *Maritime Transport and Offshore Facilities Security Act 2003* and *Maritime Transport and Offshore Facilities Security Regulation 2003* (Cwlth)
- Transport Security (Counter Terrorism) Act 2008 and Regulations (Qld)
- International Ship and Port Facility Security Code (International Maritime Organization 2003).

A maritime security plan should be submitted as a separate confidential document to the Coordinator-General at the time of submission of the EIS.

The maritime security plan, which is to be developed in consultation with national and state maritime security representatives and incorporated in the EIS, should contain:

- an outline of relevant project information, such as the contact details of the proponent and port operator and security officer responsible for implementing the plan
- a map showing each zone that is covered by the plan, along with site boundaries and any security zones within the area that will be covered by the plan
- a security assessment that is in accordance with Regulation 3.05 of the *Maritime Transport and Offshore Facilities Security Regulation*
- details of common requirements for security plan audits and reviews
- the security measures or activities to be implemented at each level of security
- details on how the plan will be implemented and will contribute towards achieving maritime security outcomes
- specific requirements that are detailed in Regulation 3.20 of the *Maritime Transport and Offshore Facilities Security Regulation*.

As part of the maritime security plan, include a security assessment that details:

- when the assessment was completed
- the scope of the assessment, including assets, infrastructure and operations
- how the assessment was conducted
- the skills and experience of those involved in the assessment
- the risk context and threat situation of the port facility
- how important assets, infrastructure and operations will be identified and evaluated
- how possible risks or threats to important assets, infrastructure and operations will be identified
- existing security measures, procedures and operations
- weaknesses in infrastructure, policies and procedures

- the identification, selection and prioritisation of possible risk treatments.

9. Cumulative impacts

Summarise the project's cumulative impacts and describe these impacts in combination with those of relevant existing or proposed major projects publicly known or advised by DSDIP to be in the region, to the greatest extent practicable. As a minimum, this must include impacts cumulative with existing operations at Port Alma, the proposed BICET and cumulative shipping impacts arising from projected increases in trade through Port Curtis as projected by GPC through the life of the project.

Assess cumulative impacts with respect to both geographic location and environmental values. In particular, address cumulative impacts in sensitive environmental areas identified in section 5.3.1 of these TOR.

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

10. Environmental management plans

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

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

- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, performance standards and associated measurable indicators, performance monitoring and reporting
- impact prevention or mitigation actions to implement the commitments
- corrective actions to rectify any deviation from performance standards
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
 - continuous improvement
 - environmental auditing
 - monitoring
 - reporting
 - staff training
 - a rehabilitation program for land proposed to be disturbed under each relevant aspect of the proposal.

The recommended structure of each element of the EMP is:

Element/issue	Aspect of construction or operation to be managed (as it affects environmental values).
Operational policy	The operational policy or management objective that applies to the element.
Performance criteria	Measurable performance criteria (outcomes) for each element of the operation.
Implementation strategy	The strategies, tasks or action program (to nominated operational design standards) that would be implemented to achieve the performance criteria.
Monitoring	The monitoring requirements to measure actual performance (for example, specified limits to pre-selected indicators of change).
Auditing	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
Reporting	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective action	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

The proponent's commitments to environmental performance, as described in the EMP, may be included as Coordinator-General's conditions to ensure the commitments are met. Therefore, the EMP is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them.

11. Conclusions and recommendations

Make conclusions and recommendations with respect to the project, based on the studies presented, the EMP, the social impact management plan (SIMP) and conformity of the project with legislative and policy requirements.

12. References

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

13. Appendices

Final TOR for this EIS

Include a copy of the final TOR in the EIS.

TOR cross-reference table

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

Project approvals

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

Consultation report

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

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

Study team

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

Glossary of terms

Provide a glossary of technical terms.

Specialist studies

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

- flora, fauna and biodiversity (including coastal and marine ecology)
- air quality
- noise and vibration
- marine hydrodynamics
- groundwater and surface water hydrology
- flooding
- geology, soils and geomorphology (including coastal and marine)
- economic studies and/or cost-benefit analyses
- transport studies (including road impacts)
- cultural heritage
- hazard and risk studies

- land use and land capability studies
- social and economic impact assessment
- contribution to cumulative impacts.

Corporate environmental policy

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

List of proponent commitments

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

Acronyms and abbreviations

Acronym/ abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i> (Qld)
ALCAM	Australian Level Crossing Assessment Model
AQIS	Australian Quarantine and Inspection Service
AS/NZS	Australian standard/New Zealand standard
BICET	Xstrata Coal's proposed Balaclava Island Coal Export Terminal, which is adjacent to the proposed Fitzroy Terminal site
CAMBA	China–Australia Migratory Bird Agreement
CHMP	cultural heritage management plan
CLR	Contaminated Land Register
Coastal Act	<i>Coastal Protection and Management Act 1995</i> (Qld)
DAFF	Department of Agriculture, Fisheries and Forestry
DEHP	Department of Environment and Heritage Protection, Queensland
DERM	Department of Environment and Resource Management, Queensland
DNPRSR	Department of National Parks, Recreation, Sport and Racing, Queensland (formerly part of DERM)
DNRM	Department of Natural Resources and Mines, Queensland
DSDIP	Department of State Development, Infrastructure and Planning, Queensland
DTMR	Department of Transport and Main Roads, Queensland
EIS	environmental impact statement
EMP	environmental management plan
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EPA	former Queensland Environmental Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPP	Environmental Protection Policy (water, air, waste, noise)
EPP (Air)	Environmental Protection (Air) Policy 2008
EPP (Noise)	Environmental Protection (Noise) Policy 2008
EPP (Water)	Environmental Protection (Water) Policy 2009
ERA	environmentally relevant activity
FTE	full-time equivalent
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRMP Act	<i>Great Barrier Reef Marine Park Act 1974</i> (Cwlth)
GBRWHA	Great Barrier Reef World Heritage Area
GPC	Gladstone Ports Corporation
HAT	Highest Astronomical Tide
JAMBA	Japan–Australia Migratory Bird Agreement
MCU	material change of use

MNES	matters of national environmental significance (under the EPBC Act)
NAGD	<i>National Assessment Guidelines for Dredging 2009</i>
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NCL	QR National's North Coast Line
NGA	National Greenhouse Accounts
NT agreement	native title agreement
NWQMS	National Water Quality Management Strategy
PDF	portable document format
REDD	Regional Ecosystem Description Database
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
DSEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SCL	strategic cropping land as defined by the SCL Act
SCL Act	<i>Strategic Cropping Land Act 2011</i>
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SIA	social impact assessment
SIMP	<i>social impact management plan</i>
SPA	<i>Sustainable Planning Act 2009 (Qld)</i>
The proponent	Fitzroy Terminal Pty Ltd
TIA	<i>Transport Infrastructure Act 1994</i>
TOR	terms of reference
VM Act	<i>Vegetation Management Act 1999 (Qld)</i>

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PO Box 15517 City East Qld 4002 Australia
tel +61 7 3404 6999

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