

Terms of reference for an environmental impact statement

Gladstone Steel Making Facility

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

The Coordinator-General
November 2009

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Abbreviations

The following abbreviations have been used in this document:

ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i>
BGD	Boulder Steel Limited (the proponent)
CHMP	Cultural heritage management plan
CLR	Contaminated Land Register
DERM	QLD Department of Environment and Resource Management
DIP	QLD Department of Infrastructure and Planning
DTMR	QLD Department of Transport and Main Roads
EIS	Environmental impact statement
EMP	Environmental management plan
EP Act	<i>Environmental Protection Act 1994</i>
EPA	Former QLD Environmental Protection Agency
ERA	Environmentally relevant activity
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cwlth)
EPP	<i>Environmental Protection Policy</i> (water, air, waste, noise)
GSDA	Gladstone State Development Area
IPA	<i>Integrated Planning Act 1997</i>
Mtpa	Million tonnes per annum
NGA	National Greenhouse Accounts
NTA	Native Title Agreement
QASSMAC	Queensland Acid Sulphate Soils Management Advisory Committee
QASSIT	Queensland Acid Sulphate Soils Investigation Team
REDD	Regional Ecosystem Description Database
RIA	Road Impact Assessment (report)
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
SIA	Social impact assessment
The proponent	Boulder Steel Limited (BGD)
TOR	Terms of reference



Part A: General information and administrative procedures

1. Project summary

Boulder Steel Limited (BGD) is proposing to construct and operate an integrated steelmaking plant at a site within the Aldoga Precinct of the Gladstone State Development Area (GSDA) in Central Queensland. The plant will produce high quality steel in bloom and round billet form (i.e. semi-finished steel) primarily for export to overseas finishing plants. The project development plan for the plant specifies ultimate production of 5 million tonnes per annum (Mtpa) of steel product with an initial stage of plant production proposed of 2.1 Mtpa. Raw materials will be sourced mainly from Australia, namely iron ore, metallurgical coke, limestone and scrap steel. Waste gases generated by the iron making process may be captured and used to produce steam to generate electricity for the national electricity market.

The estimated capital cost of development of Stage 1 of the steel making facility is US\$0.9 billion (A\$1.0 billion). It is expected that development of Stage 2 will require investment of a further US\$0.9 billion (in today's dollars).

Financial Close and all approvals are expected to be in place by Quarter three, 2010 with bulk earthworks commencing during the fourth quarter 2010. First 'hot metal' is expected some 27 months later during Quarter one, 2013. Plant output will increase to full capacity (Stage 2) as soon as practicable after completion of the first stage facility, provided that market conditions remain favourable.

The benefits to the state of Queensland of the progression of the project are substantial and include:

- creation of over 600 new long term jobs during Stage 1 and a further 550 jobs in Stage 2 for a total of 1150 new long terms jobs in the operations of the steel making facility
- creation of approximately 900 jobs on average over two years during the construction of Stage 1, with an expected peak employment for construction of 1500 persons. Construction phase jobs for Stage 2 are expected to be of similar number to Stage 1
- generation of approximately 1800 full time equivalent jobs throughout other sectors of the regional economy for the operations of Stage 1, with a similar number of further jobs expected to be created through the project's ultimate development to Stage 2
- improvement of the skill base of the labour pool
- development of a new industry base in Central Queensland
- development of additional electricity generation capacity through the 'environmentally smart' use of waste heat and gases
- generation of additional export revenue through significant value adding to current export products, with the replacement of the export of steel making materials (iron ore and metallurgical coal) with the export of semi-finished steel products.

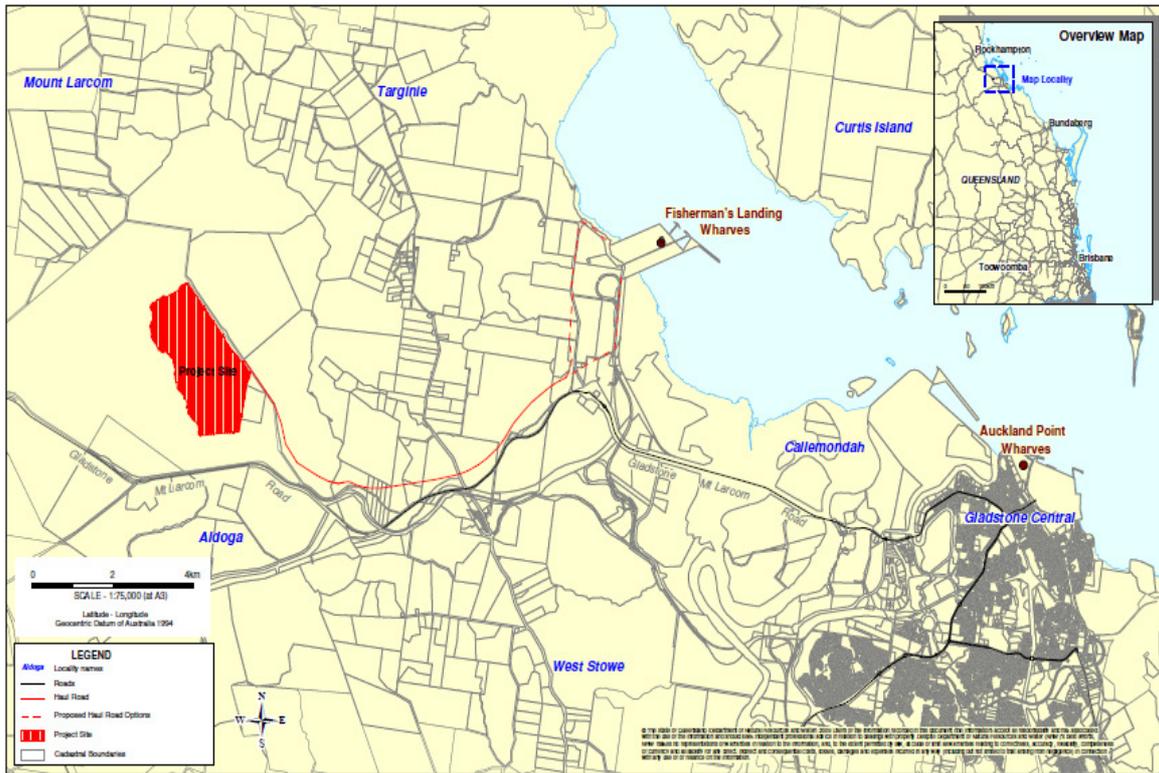


Figure 1 – Gladstone Steel Making Facility locality map

The project site is located in the eastern part of the Aldoga Precinct of the GSDA. The site is contained on part of Lot 2 on SP 157677 which is owned by the state government (owned by the Minister for Industrial Development (Department of Infrastructure and Planning)). The site is located approximately 22 km to the northwest of Gladstone and 10 km to the east of the township of Mt Larcom (both by road). The site is approximately 495 hectares in size. A locality map is provided at Figure 1.

The site is generally of a shallow slope, sloping from the north-east (Mt Larcom Range area) to the west/south-west. Larcom Creek runs along the western boundary of the site. To the east and north of the site are the Mt Larcom ranges and to the south of the site is the Gladstone - Mt Larcom Road, the existing North Coast Rail Line and the proposed area for the Queensland Rail Network Access rolling stock maintenance yard and provisioning facilities (Aldoga Rail Yard).

On land adjacent and to the east of the proposed area, a sub-station is currently being developed for Powerlink. An easement (of approximately 25 ha in area) for high voltage power lines that will feed the sub-station bisects the Project site (from the south-east to the north-west).

The plant is proposed to be constructed in two stages. Stage 1 is intended to produce 2.1 Mtpa of product being steel billets and blooms and Stage 2 an additional 2.9 Mtpa, equating to an ultimate production rate of 5 Mtpa. Each of the components of the plant will be scaled according to the required sizing needed to achieve the overall throughput. A brief description of the proposal and its components is provided below.

Raw materials receipt, storage and handling

Most of the raw materials required for the project will be delivered by sea and will be unloaded at a Fisherman's Landing Berth (to be constructed) within Port Curtis, and transported by trucks to the plant site along the transport corridor. Initially it is expected that iron ore will be sourced from deposits in Western Australia and shipped to Port Curtis. Coal will be sourced from the Bowen Basin, delivered to the vicinity of the site by rail, and then transported to the site's stockpiles from the coal dump stations. Limestone and burnt lime will be sourced from the Gladstone / Rockhampton area and will be delivered to the site by road. Ferro alloys will be shipped in through Port Curtis (likely to be through Auckland Point wharf) and trucked to site. Scrap steel will be trucked to the site from various sources in the Gladstone region and other parts of Queensland, with a portion being sourced from internal process scrap raisings.

Overall quantities of raw materials to be handled annually and requisite storage capacities are shown in Table 1 for both Stages 1 and 2. Additional quantities for Stage 2 are shown in brackets.

Material	Annual quantity handled (tonnes)	Stockpile quantity (tonnes)
Iron ore	3 090 000 (4 264 000)	185 000 (92 000)
Coal	1 470 000 (2 028 000)	70 000 (35 000)
Limestone	745 000 (1 028 000)	20 000 (10 000)
Ferrous scrap	205 000 (283 000)	12 000 (6000)
Burnt lime	88 000 (121 000)	2000 (1000)
Ferro-alloys	19 000 (26 000)	3000 (1500)

Table 1 - Raw Materials Handled / Stored (stage 2 in brackets)

Coke ovens

The coke ovens are used to convert coal into coke, a hard, porous material strong enough to support the weight of the charge materials in the blast furnace shaft. The ovens will be arranged in three batteries of 62 ovens for the initial development with an additional four identical batteries added for the second stage. The 186 (3 x 62) ovens for stage 1 will produce sufficient coke for the steel making plant and generate 70 MW of electrical power from the waste heat through a cogeneration power facility. The ovens operate continuously. All the coke produced is used in the downstream processes.

Sinter plant

The majority of iron ores available are unsuitable for charging directly into the blast furnace because of their fineness. One sinter strand (machine) will be initially installed with an additional identical strand installed at the second stage. The sinter machine itself is a continuous grate formed of steel pallets 4-5 m wide and 80-100 m long, with high chrome cast steel grate bars on the floor of the pallet.



Blast furnace

A single 2500 m³ (internal volume) blast furnace will be installed initially with a second furnace added at stage two. The blast furnace reduces the iron oxide in iron ore or sinter into molten iron by passing a gas rich in carbon monoxide, at high pressure, through a shaft packed with ore, sinter and coke. The gas coming off the top of the furnace has a low calorific value and can be used for heating the hot blast stoves and steam-raising. Waste gases from the blast furnace may be used to generate power in the cogeneration power facilities (675 GWh). Also the pressure of the top gas is reduced through an expansion turbine driving an electric generator (TRT), which generates 10 MW of power.

The iron is separated from the slag on the casthouse floor and is taken in refractory-lined ladles (on heavy haul carriers) to the steelmaking shop. A very small amount is dumped into pits to make “flat iron” due to process disruptions at the steelmaking shop.

Basic oxygen furnace

The iron produced by the blast furnace contains a number of impurities that must be removed to produce steel. They are removed by blowing a stream of pure oxygen onto the surface of the iron in the brick-lined converter vessel. The oxidation of these impurities gives off a significant amount of heat with the temperature of the molten metal being raised about 300 degrees Celsius.

Two vessels are provided initially (to allow for vessel relining as required), with a campaign vessel life of in excess of 6000 heats expected. A third vessel will be added at Stage 2. The size of the vessel allows heats of 250 tonnes to be made. Once all the impurities have been removed the vessel is sampled, final adjustments are made, and the vessel is then tapped with the liquid steel being run into a brick-lined steel ladle, with a slag dart used to prevent any slag carryover.

In large plants the gases coming from the mouth of the vessel are at about 2200°C. These gases which are principally carbon monoxide can be collected and fired in a boiler to raise steam for electricity generation. For Stage 1 of the project this gas will be flared to the atmosphere. For Stage 2, (5 Mtpa production) this gas may be used in cogeneration power facilities (potential further 182 GWh generation).

Continuous casters

The liquid steel produced in the basic oxygen furnace must be cast into billets (either square or round in cross-section) or larger sections such as blooms. This is done by pouring the steel into a tundish and thence into a copper mould that is very intensively water cooled. Initially a four strand round billet caster and a four strand bloom caster will be installed and an additional billet caster added at Stage 2.

Finished product storage

Finished products will be transported to Fisherman's Landing area for consolidation prior to loading onto customers' ships. These are in the form of steel billets and blooms. The indicative Stage 1 quantities to be transported from the plant are as shown in Table 2 with the additional quantities for Stage 2 shown in brackets.

Slag from iron and steelmaking processes will be transported by truck to local customers with the major quantity being taken by the Australian cement industry. The cement industry will also take some of the dusts that cannot be recycled within the steel making process.

Material	Annual quantity handled (tonnes)	Stockpile (tonnes)
Steel billets	2 100 000 (2 900 000)	120 000 (60 000)
Iron making slag	520 000 (720 000)	20 000 (10 000)
Steelmaking slag	263 000 (363 000)	20 000 (10 000)

Table 2 - Product Quantities Handled and Stored (stage 2 quantities in brackets)

External infrastructure requirements

Development of the site for the steel making facility requires access to various transport and service infrastructure including:

- Transport access for the site:
 - proposed haul road for transport of materials to and from the Fisherman’s Landing area. The infrastructure within the DIP transport corridor will be developed by BGD. The infrastructure from the DIP transport corridor to the site will also be developed by BGD. This infrastructure would be a non-public road for use of heavy haulage trucks only.
 - proposed roads for general access to the site (employees, deliveries, visitors, etc). This would be a public access road taking off from the Gladstone - Mt Larcom Road in the vicinity of the existing Flynn Road. This access would be shared between BGD, the proposed Aldoga rail yard and other developments in the Aldoga Precinct (north of Gladstone – Mt Larcom Road).
 - proposed rail access for coal transport to the site. A new rail siding in the vicinity of the site will be utilised. Coal would then be transported from the rail siding to the site.
- Services access for the site:
 - electrical power for the proposed site. As the project site is directly adjacent to a sub-station currently being developed, access to electrical power for the site will be able to be provided at the site boundary with minimal infrastructure development required.
 - natural gas for the proposed site. Natural gas is required in the blast furnace of the plant and would be used as top up gas in the co-generation power station. Access is to be developed from existing and planned corridors.
 - water for the proposed site. Water is required in the process of steel production with a total of 5,250 ML required on an annual basis (Stage 1). Access is to be developed from existing and planned corridors.
 - access to the co-generation facility. It is assumed that the co-generation facility would be developed directly adjacent to the proposed site. Therefore access from the site for heat and gas to the co-generation facility would be directly at the boundary of the steel making facility.



Project EIS boundaries

Given the various infrastructure to be developed in concurrence with this project (some of which will be multi-user infrastructure) it is considered relevant to clarify the project boundaries that will apply to the EIS for the Project. The EIS will consider both Stage 1 and Stage 2 of the development and operation of the steel making facility i.e. the EIS will consider the ultimate planned production for the facility of 5 Mtpa. The EIS will consider:

- construction of the steel making facility at the project site
- the development of the site access road for haul trucks and general access from the DIP haul road corridor and Gladstone - Mt Larcom Road respectively
- operations of the steel making facility (including the oxygen plant) on the environment, community and economy.
- construction of the haul road to be located in the planned infrastructure corridor from Fisherman's Landing to the Aldoga area.
- the port and shipping activities associated with the transport of raw materials and finished product.

The EIS will not consider:

- construction of marine infrastructure that is subject of existing approvals or that is currently undergoing appraisal through other assessment processes
- construction of the water and natural gas pipelines developed to service the site. These impacts will be assessed by the proponents of those developments respectively.
- construction of the proposed co-generation power station to be developed adjacent to the steel making facility. These impacts will be assessed by the proponent of that facility.
- operations of the proposed co-generation power station and therefore the EIS must address all air emission from the project. The impacts of the co-generation facility will be assessed by the proponent of that development.

2. Project proponent

The project proponent for the Gladstone Steel Making Facility project is Boulder Steel Limited (BGD). BGD is an Australian publicly listed company (A.C.N. 009 074 588) with its principal office address at Level 2, 16 Byfield Street, North Ryde, New South Wales. BGD is listed on the Australian Stock Exchange (Perth), the Frankfurt, Stuttgart, Munich, Berlin/Bremen stock exchanges in Germany and on the Dubai International Finance Exchange. Boulder has major investors in Germany and among Australian financial institutions.



BGD is currently negotiating a Middle Eastern partnership for the steel making plant.

BGD contact details are as follows:

Boulder Steel Limited
Macquarie Centre
PO Box 1293
North Ryde NSW 2113
tel : +61 2 9413 1811
email : admin@bouldersteel.com.au

www.bouldersteel.com.au

3. Legislative framework

On 13 November, 2008 BGD lodged an initial advice statement (IAS) and a request for 'significant project' declaration with the Queensland Coordinator-General. The IAS provides an outline of the proposed project, including the project rationale and its potential impacts.

On 3 April 2009, the Coordinator-General declared the project to be a "significant project for which an EIS is required" under Section 26(1)(a) of the Queensland State Development and Public Works Organisation Act 1971 (SDPWO Act). Matters considered by the Coordinator-General in making this declaration included information contained in the IAS, relevant planning schemes and policy frameworks, infrastructure impacts, employment opportunities, environmental effects, complexity of local, state and Australian Government requirements, level of investment and the project's strategic significance.

This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires BGD to prepare an environmental impact statement (EIS) for the Project.

The project was referred to the Australian Government Department of the Environment, Water, Heritage and the Arts on 4 March 2009 for as determination as to whether the project constituted a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). On 23 June 2009 it was determined by the Australian Government that the proposed action (constituting the Project) is not a controlled action.

To undertake the development it is likely that BGD will require development approvals including approvals under the *Integrated Planning Act 1997* (IPA) and the *Environmental Protection Act 1994* (the EP Act).

The term EIS used in these terms of reference (TOR) should be interpreted as satisfying the impact assessment requirements of all relevant Queensland legislation (i.e. including, but not limited to, the SDPWO Act, the EP Act, and the IPA).

The Department of Infrastructure and Planning (DIP) is coordinating the EIS process on behalf of the Coordinator-General. Relevant Queensland and local government authorities have been invited to participate in the EIS process as advisory agencies.

The first step in the impact assessment process under the SDPWO Act is the development of TOR for the EIS. The process involves the formulation of draft TOR that are made available for public and advisory agency comment. TOR are then prepared having regard to comments and submissions received. These TOR are the result of that process.



BGD will prepare an EIS to address the TOR. Once the EIS has been prepared to the satisfaction of the Coordinator-General, comment on the EIS will be sought from the public and agencies. A public notice will be advertised in relevant newspapers inviting public comment. The notice will state where copies of the EIS can be viewed or purchased, the submission period and where the submissions should be sent.

BGD may be required to prepare a supplementary EIS to address specific comments submitted by advisory agencies and members of the public.

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 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 and other submissions accepted by the Coordinator-General, and any other material the Coordinator-General thinks relevant to the project such as a supplementary report to the EIS, comments and advice from advisory agencies and other entities, technical reports and legal advice.

The Coordinator-General's report will be publicly notified by placing it on the DIP website at www.dip.qld.gov.au/projects. The Coordinator-General's report will also be presented to BGD, the assessment manager under the IPA, and may be presented to other persons required under other legislation to approve the project.

4. EIS objectives

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

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

- **for interested bodies and persons:** a basis for understanding the project, prudent and feasible alternatives, affected environmental values, impacts that may occur, and the measures to be taken to mitigate all adverse impacts
- **for affected persons - that is, groups or persons with rights or interests in land, as defined under section 38 of the EP Act, or water, as defined under the Water Act 2000:** an outline of the effects of the proposed project
- **for government agencies and referral bodies:** a framework for decision-makers to assess the environmental aspects of the proposed project with respect to legislative and policy provisions, and based on that information, to make an informed decision on whether the project should proceed or not, and if so, subject to what conditions, if any
- **for the proponent:** a mechanism by which the potential environmental impacts of the project are identified and understood, including information to support the development of management measures, such as an environmental management plan, to mitigate the effects of adverse environmental impacts of the development.

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

5. EIS guidelines

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the project and the management measures employed to mitigate adverse impacts. The main EIS report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the approach to be adopted requires that:

- scientific studies are used to predict environmental impacts and details of their methodology, reliability, and any relevant assumptions or scientific judgements are indicated
- the EIS is to present all technical data, sources or authority and other information used to assess impacts
- proposed measures to mitigate and manage identified issues are described and evaluated
- residual impacts that are not quantifiable are described qualitatively, in as much detail as reasonably practicable
- a discussion of the criteria adopted in assessing the proposed project and its impacts, for instance: compliance with relevant legislation, policies, standards, community acceptance is included
- the level of investigation of potential/uncertain impacts on the environment is proportionate to both the severity and the likelihood of those events occurring
- issues that may emerge during the investigations and preparation of the EIS are adequately addressed and the necessary studies are undertaken and reported
- all relevant matters concerning environmental values, impacts and proposed mitigation measures are addressed for the first time in the main text of the EIS and not in an appendix or the draft environmental management plan
- adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate.

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

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

6. Stakeholder consultation

BGD should undertake a comprehensive and inclusive consultation plan with the stakeholders identified in section 1.8, Part B. Consultation with advisory agencies should be the principal forum for identifying legislation, regulations, policies and guidelines relevant to the project and EIS process.

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

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

7. General EIS format

The EIS should be written in a format matching the TOR or include guidelines (preferably as an appendix) describing how the EIS responds to the TOR. There should be clear demarcation between material in the EIS that refers to any separate project components to allow assessment agencies and other readers to differentiate between the project components.

The EIS should contain (possibly as part of the executive summary) a one page, brief guide as to where a range of categories of information for various readers are located in the report. This should particularly cover subjects that are presented in a number of places in the EIS.

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

Limited copies of the EIS should be produced on A4-size paper capable of being photocopied, with maps and diagrams of A4 or A3 size.

The EIS should be produced in a format suitable for publishing on the proponent's web site and an executive summary, no larger than 2 MB in size, should be provided for placement on the DIP website. Both sites should maintain hyperlinks to each other.

Consideration should be given to publishing the EIS as a website in HTML for the main body of the report with supporting material as PDF files. If the EIS is published on a website in HTML, it must meet the *W3C web content accessibility guidelines (WCAG)* as outlined at: www.w3.org/WAI/intro/wcag.php.

Alternatively the EIS may be produced completely as PDF documents which must be no larger than 2 MB in size. Documents can be provided in sections to meet this size requirement. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing. PDF documents must be accessible and it is recommended they are produced in accordance with Adobe's PDF accessibility best practice guides available at: www.adobe.com/accessibility/products/acrobat/training.html.

PDF documents must, at a minimum, meet the following accessibility requirements:

- document structure tags and proper read order
- searchable text
- alternative text descriptions
- security that does not interfere with assistive technology.

The EIS should also be produced on CD-ROM or other electronic memory device in Adobe®PDF format. All compression must be down-sampled to 72 dpi (or ppi).

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

8. DIP contact details

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

EIS Project Manager—Gladstone Steel Making Facility
Significant Projects Coordination
Department of **Infrastructure and Planning**
PO Box 15009
City East QLD 4002
tel : +61 7 3405 6205
fax : +61 7 3225 8282
email : GSMF@dip.qld.gov.au

www.dip.qld.gov.au



Part B: Contents of the EIS

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

Executive summary

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

The executive summary should include:

- the title of the project
- name and contact details of BGD and a discussion of previous projects undertaken by BGD, 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 the selection of the proposed development option
- a brief description of the project (pre-construction, construction, operational activities and decommissioning) and the existing environment, utilising visual aids where appropriate
- an outline of the principal environmental (including cumulative) impacts predicted and the proposed environmental management strategies and commitments to minimise the significance of these impacts.

Detailed maps of the proposed project location and any other critical figures should also be included.

Glossary of terms

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

1 Introduction

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

1.1 Project proponent

This section should describe the experience of BGD, including the nature and extent of business activities, experience and qualifications, and environmental record, including BGD's environmental, health, safety and community policies.

1.2 Project description

A brief description of the key elements of the project should be provided with illustrations or maps. Any major associated infrastructure requirements should also be summarised. Detailed descriptions of the project should follow in Section 2.

1.3 Project rationale

The specific objectives and justification for the project should be described including its strategic, economic, environmental and social implications, technical feasibility and commercial drivers. The status of the project should be discussed in a regional, state and national context.

1.4 Relationship to other projects

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

1.5 Alternatives to the project

This section should describe feasible alternatives including conceptual, technological and locality alternatives to the proposed project, as well as discussion of the consequences of not proceeding with the project. Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options or courses of action and rejecting others. This should include a discussion of the 'no action' option. A discussion of the methodology adopted to discern between the feasible options should be included.

The interdependencies of the project components should be explained, particularly in regard to how each of 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.

1.6 Co-location opportunities

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



Whilst it may be inappropriate for this EIS to evaluate the environmental impacts of other infrastructure not directly required for this project, the EIS should describe the broad implications of locating other forms of linear infrastructure within or near the proposed project infrastructure. Where co-location may be likely, the EIS should consider opportunities to coordinate or enhance any of the impact mitigation strategies proposed through cooperation with other proponents in the locality.

1.7 The environmental impact assessment process

1.7.1 Methodology of the EIS

This section should provide an outline of the environmental impact assessment process including the role of the EIS in the Coordinator-General's decision making process. It should include information on relevant stages of the EIS development, statutory and public consultation requirements and any interdependencies that exist between approvals sought.

The information in this section is required to ensure:

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

1.7.2 Objectives of the EIS

This section should provide a statement of the objectives of the environmental impact assessment process. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The role of the EIS in providing information for the formulation of the Environmental Management Plan (EMP) for the project should be discussed.

1.7.3 Submissions

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

1.8 Public consultation process

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 (i.e. newsletters), and other consultation mechanisms to encourage and facilitate active public consultation. Public consultation processes (community engagement) for all parts of the EIS should be integrated.

This section should outline the methodology that has been adopted to:

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



A list of the stakeholders consulted during the program should be provided as well as any meetings held, presentations made and any other consultation undertaken for the EIS process. Information about the consultation processes conducted and their results should be provided.

1.9 Project approvals

1.9.1 Relevant legislation and approvals

This section must describe and list Commonwealth and state legislation and policies relevant to the planning, approval, construction and operation of the project. The EIS should identify all approvals, permits, licences and authorities that will need to be obtained for the proposed project. Triggers for the application of each of these should be outlined and relevant approval requirements identified.

Relevant Australian Government legislation may include, among other things:

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Native Title Act 1993*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994*
- other relevant Commonwealth obligations such as protection of World Heritage values, migratory animals (CAMBA, JAMBA and Bonn Convention) and wetlands of international importance (Ramsar).

Reference must also be made to applicable Queensland legislation including but not limited to:

- *Environmental Protection Act 1994*
- *Integrated Planning Act 1997*
- *Fisheries Act 1994*
- *Land Act 1994*
- *Nature Conservation Act 1992*
- *Queensland Heritage Act 1992*
- *Transport Infrastructure Act 1994*
- *Vegetation Management Act 1999*
- *Water Act 2000*.

1.9.2 Relevant plans

This section should outline the project's consistency with the existing national, state, regional and local planning framework that applies to the project location. This should include reference to all relevant statutory and non-statutory plans, planning policies, guidelines, strategies and agreements.

1.9.3 Environmentally relevant activities

A brief description is required for each environmentally relevant activity (ERA) and associated activities which are to be carried out in connection with the project. A detailed description of each ERA should be presented in section 3—Environmental values and management of impacts, and detail of the impact on land, water, air, noise and any other relevant environmental values identified.

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



2 Description of the project

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

2.1 Overview of the project

The EIS should provide an overview of the project to put it into context. This section should include:

- a description of the key components of the project including the use of text and design plans where applicable
- the expected cost, timing, and overall duration of the project
- a summary of any environmental design features of the project should be presented.

2.2 Location

This section should describe, through maps at suitable scales, the regional and local context of the project and all associated infrastructure. Real property descriptions of the project should be provided. Maps should show the precise location of the project area, in particular:

- the location and boundaries of current or proposed land tenures, that the project area is or will be subject to
- the location and boundaries of the project footprint, including easement widths and access requirements
- the location of any proposed buffers surrounding the working areas (for construction and operation)
- the location of infrastructure relevant to the project
- the location of natural features such as waterways (e.g. rivers, streams, creeks, other waterbodies and wetlands) and shorelines
- the location(s) of any proposed site offices and accommodation sites.

2.3 Construction

The following information should be provided on the pre-construction, construction and commissioning of the project including detailed plans where appropriate.

2.3.1 Pre-construction activities

This section should set out a description of all the pre-construction activities, including:

- any land acquisitions required, be it in full or as easements, leases etc.
- vegetation clearing
- site establishment requirements for construction facilities, including access restriction measures
- temporary works
- upgrade, relocation, realignment or deviation of roads and other infrastructure.

2.3.2 Construction

This section should set out a description of all the construction elements of the project including:

- an indicative construction timetable, including expected commissioning and start-up dates and hours of operation
- description of 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 .

2.3.3 Commissioning

A description of the commissioning process including the associated environmental impacts should be provided.

2.4 Operation

This section should provide full details of the operation for all elements of the project, including:

- a description of the project site, including concept and layout plans of buildings, structures, plant and equipment to be employed
- nature and description of all key operational activities
- the capacity of the project equipment and operations
- estimated numbers and roles of persons to be employed during the operational phase of the project.

2.5 Associated infrastructure

This section should detail, with concept and layout plans, requirements for new infrastructure or the upgrading/ relocating of existing infrastructure to service the project. Matters to be considered include such infrastructure as transportation, water supply, energy supply, telecommunications, stormwater and sewerage.

2.6 Decommissioning and rehabilitation

The means of decommissioning the facility, both from the construction and operational phases, in terms of the removal or making safe of plant, equipment, structures and buildings should be described, and the methods proposed for the rehabilitation of the affected areas should be given. Final rehabilitation of the site should be discussed in terms of ongoing land use suitability, management of any residual contaminated land and any other land management issues.

Detail of the impacts of the preferred rehabilitation strategy should be discussed in the appropriate subsections of Section 3, Environmental values and management of impacts, should be included.

Reference should also be made to infrastructure that is not intended to be decommissioned. In this situation the entity, to which the infrastructure is intended to be transferred, should be described with the proposed environmental management regimes.



3 Environmental values and management of impacts

The objectives of subsequent sections 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. This shall include reference to environmental values as 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 by combination with other known existing or planned projects
- present objectives, standards and measurable indicators that protect the identified environmental values
- examine viable alternative strategies for managing impacts. These alternatives should be presented and compared 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.

This section should detail the environmental protection and mitigation measures incorporated in the planning, construction, commissioning, operations, decommissioning and rehabilitation 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. Preferred measures should be identified and described in more detail than other alternatives. In accordance with the Queensland Government Environmental Offset Policy, proposals to offset potential impacts should be presented.

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

3.1 Climate, natural hazards and climate change

This section should 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. A risk assessment and management plan detailing these potential threats to the construction, and operation of the project should be provided. The most recent information on potential impacts of climatic factors should be addressed in the appropriate sections of the EIS.

An assessment of climate change risks and possible adaptation strategies should be included, as well as the following:

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

3.2 Land

This section should detail the existing land environment values for all areas associated with the project. This section should also describe the potential for the construction and operation of the project to change existing and potential land uses of the project site and adjacent areas.

3.2.1 Topography and scenic amenity

3.2.1.1 Description of environmental values

Maps should be provided 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. Significant features of the landscape and topography should be included on the maps and should be discussed.

This section should describe in general terms the existing character of the landscape and the general impression that would be obtained while travelling through and around it. This section should describe existing landscape features, panoramas and views that have, or could be expected to have, value to the community. Information in the form of maps, elevations and photographs should be used, particularly where addressing the following issues:

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

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

3.2.1.2 Potential impacts and mitigation measures

This section should 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.

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

Method of management of the lighting of the project (during all stages) is to be provided, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid:

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

3.2.2 Geology and soils

3.2.2.1 Description of environmental values

The EIS must provide a description, map and a series of cross-sections of the geology of the project area relevant to the project components. Geological properties that may influence ground stability, occupational health and safety, or the quality of wastewater leaving any area disturbed by the project must be described.

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, storm water run-off quality, rehabilitation and agricultural productivity of the land. Information must also be provided on soil stability and suitability for construction of project facilities.

An assessment of the potential for acid sulfate soils should be conducted in accordance with Queensland Acid Sulfate Soils Management Advisory Committee (QASSMAC) guidelines and the State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* and its accompanying *Guideline 2/02*.

3.2.2.2 Potential impacts and mitigation measures

Identify for all permanent and temporary landforms the possible soil erosion rate and provide a description of the techniques used to manage the impact. The erosion potential (both wind and water) and erosion management techniques to be used should be outlined. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during construction, must also be outlined and acceptable mitigation strategies provided.

The report must include an assessment of likely erosion effects, especially those resulting from the removal of vegetation and disturbed areas including stockpiles, dams, banks and creek crossings or floodway areas, the plant site, including buildings and access roads or other transport corridors.

Summarise methods proposed to prevent or control erosion with regard to (a) the Soil Erosion and Sediment Control - Engineering Guidelines for Queensland Construction Sites (Institute of Engineers Australia (Qld Division) 1996); (b) the EPA Guideline – EPA Best Practice Urban Stormwater Management: Erosion and Sediment Control; (c) preventing soil loss in order to maintain land capability/suitability; and (d) preventing degradation of local waterways.

The potential for acid generation by disturbance of acid sulfate soils during earthworks and construction should be discussed and measures for management of soils and mitigation of impacts should be proposed for all site earthworks and construction activities. Should action criteria be triggered by acid generating potential as a result of testing, management measures are to be outlined in an Acid Sulfate Soils Management Plan prepared in accordance with Queensland Acid Sulfate Soils Investigation Team (QASSIT) guidelines and the requirements of State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* and its accompanying *Guideline 2/02*.

3.2.3 Land contamination

3.2.3.1 Description of environmental values

The following information needs to be presented in the EIS:

- 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 which may need remediation

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

3.2.3.2 Potential impacts and mitigation measures

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

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

Intentions should be stated concerning the classification of land contamination after project completion.

3.2.4 Land use and tenure

3.2.4.1 Description of environmental situation

The EIS should identify, with the aid of maps:

- land tenure, including reserves, tenure of special interest such as protected areas and forest reserves, identification of existing and proposed gas infrastructure, water pipelines, power lines and transport corridors, including local roads, state-controlled roads, rail corridors and other infrastructure relevant to the Project
- existing land uses and facilities surrounding the project
- areas covered by applications for native title determination, with a description of Native Title Representative Bodies' (NTRB) boundaries
- distance of the project from residential and recreational areas or other potentially non-compatible land uses
- location of the project in relation to environmentally sensitive areas
- information on any known occurrences of economic mineralisation and extractive resources, petroleum and gas deposits within the project area and the potential impact of the project on these operations and associated tenements (e.g. Stuart Shale Oil).

3.2.4.2 Potential impacts and mitigation measures

The potential for the construction and operation of the project to change existing and potential land uses of the project site and adjacent areas should be detailed.

A description of the following should be included:

- impacts on surrounding land uses and human activities and strategies for minimisation and management of impacts, including those on:
 - Good Quality Agricultural Land
 - Key Resource Areas (refer to State Planning Policy 2/07: Protection of Extractive Resources, and associated Guideline)
 - residential and industrial uses
- possible impact on town planning objectives and controls, including local government zoning and strategic plans
- constraints to potential developments and possibilities of rezoning adjacent to the development area



- management of the immediate environs of the project including construction buffer zones
- the identification of the potential native title rights and interests likely to be impacted upon by the project and the potential for management of those impacts by an Indigenous Land Use Agreement or other native title compliance outcomes
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services
- identification of any land units requiring specific management measures.

3.3 Nature conservation

This section should detail the existing nature conservation values that may be affected by the proposal in terms of:

- integrity of ecological processes, including habitats of rare and threatened species
- conservation of resources
- biological diversity, including habitats of least concern (common), rare, vulnerable, near threatened and endangered species
- integrity of landscapes and places including wilderness and similar natural places
- aquatic and terrestrial ecosystems.

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

The section should also outline the proposed strategies to avoid, or minimise and mitigate impacts on the identified values within the project's footprint.

Key flora and fauna indicators should be identified for future ongoing monitoring.

3.3.1 Sensitive environmental areas

3.3.1.1 Description of environmental values

The EIS should identify areas that are environmentally sensitive in proximity to the project 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. Reference should be made to both Queensland and Australian Government 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 which should be identified and mapped:

- important habitats of species listed under the *Nature Conservation Act 1992* and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as presumed extinct, endangered, vulnerable, rare, or near threatened
- regional ecosystems listed as 'endangered' or 'of concern' under State legislation, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

- good representative examples of remnant regional ecosystems which are described as having 'medium' or 'low' representation in the protected area estate as defined in the Regional Ecosystem Description Database (REDD) available on the DERM website
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA)
- sites adjacent to nesting beaches, feeding, resting or calving areas of species of special interest; for example, marine turtles and cetaceans
- sites containing common species which represent a distributional limit and are of scientific value or which contains feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
 - natural vegetation in good condition or other habitat in good condition (e.g. wetlands)
 - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area
- a site containing other special ecological values, for example, high habitat diversity and areas of high endemism
- ecosystems which provide important ecological functions such as: 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 1994*
- sites of palaeontologic significance such as fossil sites
- sites of geomorphological significance, such as lava tubes or karst
- protected areas which have been proclaimed under the *Nature Conservation Act 1992* and *Marine Parks Act 1982* or are under consideration for proclamation
- areas of major interest, or critical habitat declared under the *Nature Conservation Act 1992* or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999*.

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, bat roosting and breeding caves including existing structures such as adits and shafts, and habitat of threatened plants, animals and communities.

3.3.1.2 Potential impacts and mitigation measures

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

The EIS should demonstrate how the project would comply with the following hierarchy:



- avoiding impact on areas of remnant vegetation and other areas of conservation value including listed species and their habitat
- mitigation of impacts through rehabilitation and restoration including, where relevant, a discussion of any relevant previous experience or trials of the proposed rehabilitation
- measures to be taken to replace or offset the loss of conservation values where avoidance and mitigation of impacts cannot be achieved
- explanation of why measures above would not apply in areas where loss would occur.

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

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

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

Where relevant, this section should discuss environmental offset relating to residual impacts in accordance with the Queensland Government Environmental Offsets Policy and taking into account the applicable specific-issue offset policies, as follows:

- *Policy for Vegetation Management Offsets* (NRW, 2007)
- *Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss* (DPI&F, 2002)
- draft *Policy for Biodiversity Offsets* (consultation draft, EPA, 2008).

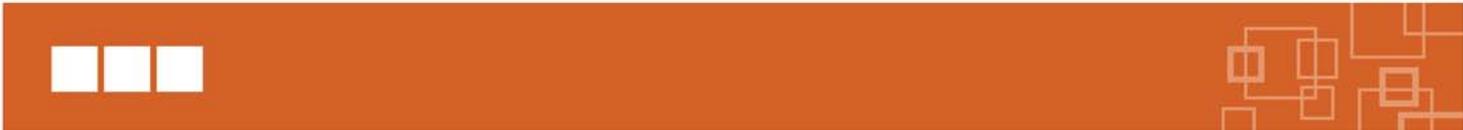
3.3.2 Terrestrial flora

3.3.2.1 Description of environmental values

Vegetation mapping should adequately describe the vegetation communities for the project site. If relevant, adjacent areas should 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.

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

- location and extent of vegetation types using the DERM's regional ecosystem type descriptions in accordance with the REDD
- location of vegetation types of conservation significance based on DERM's regional ecosystem types and occurrence of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments, as well as areas subject to the *Vegetation Management Act 1999*
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges)
- any plant communities of cultural, commercial or recreational significance should be identified
- location and abundance of any exotic or weed species.



The existence of rare or threatened species should be specifically addressed. 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
- appropriate minimum site sizes should be selected, observing recognised sampling approaches and providing an adequate sample of surveyed communities;
- a complete list of species present at each site should be recorded
- The surveys should include species structure, assemblage, diversity and abundance
- the relative abundance of plant species present should be recorded
- any plant species of conservation, cultural, commercial or recreational significance should be identified
- specimens of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994*, 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. Methodology used for flora surveys should be specified in the appendices to the report.

3.3.2.2 Potential impacts and mitigation measures

The potential environmental harm to the ecological values of the area arising from the construction, operation and decommissioning of the project including clearing, salvaging or removal of vegetation should be described, and the indirect effects on remaining vegetation should be discussed. Short-term and long-term effects should be considered with comment on whether the impacts are reversible or irreversible.

With regard to all components of the project, this section should 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 ground water environment with specific reference to impacts on riparian vegetation or other sensitive vegetation communities

Outline how these measures will be implemented in the overall EMP for the project. Weed management strategies are required for containing existing weed species (e.g. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Reference should be made to the local government authority's Pest Management Plan when determining control strategies. The strategies should be discussed in the main body of the EIS and provided in a working form in a Pest Management Plan as part of the overall EMP for the project.



3.3.3 Terrestrial fauna

3.3.3.1 Description of environmental values

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

- species diversity (i.e. 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 exotic animals including those of economic or conservation significance
- existence (actual or likely) of any species/communities of conservation significance in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans or Threatened Species Recovery Plans)
- use of the area by migratory fauna, in particular any areas used for breeding or significant congregations

The EIS should identify any listed species by the EPBC Act and the *Nature Conservation Act 1992* occurring in the project area. Species listed by the DERM 'Back on Track' species prioritisation methodology should be identified.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the bio-region where the project occurs. The methodology used for fauna surveys should be specified. Relevant site data should be provided to the DERM in a format compatible with the *WildNet* database for listed threatened species.

3.3.3.2 Potential impacts and mitigation measures

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

- impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors or as a result of hydrological change
- impacts on native species, particularly species of conservation significance
- cumulative effects of direct and indirect impacts
- threatening processes leading to progressive loss

The EIS should address any actions of the project or likely impacts that require an authority under the *Nature Conservation Act 1992*.

With respect to mitigation strategies the following should be provided:

- 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.

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

3.3.4 Aquatic biology

3.3.4.1 Description of environmental values

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

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area and any associated wetlands
- any rare or threatened marine species
- description of the habitat requirements and the sensitivity of aquatic species to changes in flow regime, water levels and water quality in the project areas
- aquatic plants including native and exotic/weed species
- aquatic and benthic substrate.

Wetlands listed by DERM as areas of national, state or regional significance should be described and their values and importance for aquatic flora and fauna species.

3.3.4.2 Potential impacts and mitigation measures

This section should provide a discussion of the potential impacts of the project on the aquatic ecosystems and a description of proposed mitigation actions, including:

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

The EIS should address any actions of the project or likely impacts that require an authority under the relevant legislation including the *Nature Conservation Act 1992* and/or the *Fisheries Act 1994*. Outline how these measures will be implemented in the overall EMP for the project.



3.4 Water resources

3.4.1 Description of environmental values

This section of the EIS should provide a description of the existing water resources that may be affected by the project in the context of environmental values as defined in such documents as the EP Act, Environmental Protection (Water) Policy 1997 (EPP (Water)), the EPA Queensland Water Quality Guidelines 2006 and other relevant documents.

An indication of the quality and quantity of water resources in the vicinity of the project area should be given. This section should describe:

- 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

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

- values identified in the EPP (Water)
- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- hydrology of waterways and groundwater
- sustainability, including both quality and quantity
- dependent ecosystems
- existing and other potential surface and groundwater users
- any water resource plans relevant to the affected catchments.

If the project is likely to use or affect local sources of groundwater, this section should provide a description of groundwater resources in the area in terms of:

- geology/stratigraphy
- aquifer type - such as confined, unconfined
- depth to and thickness of the aquifers
- depth to water level and seasonal changes in levels
- groundwater flow directions (defined from water level contours)
- interaction with surface water
- possible sources of recharge
- potential exposure to pollution
- current access to groundwater resources in the form of bores, springs, 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 sulphate soils including spatial and temporal monitoring to accurately characterise baseline groundwater characteristics.

3.4.2 Potential impacts and mitigation measures

This section should assess potential impacts of the project on water resource environmental values identified in the previous section. It should also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed. Matters to be addressed should include:

- potential impacts on the flow and the quality of surface and ground waters 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 2000*
- chemical and physical properties of any waste water including stormwater at the point of discharge into natural surface waters, including 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
- an assessment of the potential to contaminate surface and ground water resources and measures to prevent, mitigate and remediate such contamination

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

Management strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives. Monitoring programs, which will assess the effectiveness of management strategies for protecting water resources during the construction, operation and decommissioning of the Project, should be described. Outline how these strategies are incorporated into appropriate sections of the EMP.

3.5 Air quality

3.5.1 Description of environmental values

This section of the EIS should 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*.

A discussion of the existing air shed environment both local and regional should be provided, including:

- background levels and sources of particulates, gaseous and odorous compounds and any major constituent
- pollutants including greenhouse gases which may be affected 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 impacts.

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

3.5.2 Potential impacts and mitigation measures

The following air quality issues and their mitigation should be considered:

- an inventory of air emissions from the project expected during construction and operational activities. This should include, but is not limited to:
 - stockpiles of process feed stocks and wastes
 - particulates generated
 - anticipated contaminants, and the potential impact on the air-shed
- identify 'worst case' background conditions and emissions that may occur during operation. If these emissions are significantly higher than those for normal operations, it will be necessary to evaluate the worst-case impact as a separate exercise to determine whether the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate
- ground level predictions should be made at any site that includes the environmental values identified by the *Environmental Protection (Air) Policy 2008*, including any sites that could be sensitive to the effects of predicted emissions
- dust generation from construction activities especially in areas where construction activities are adjacent 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 should be assessed
- impacts on terrestrial flora and fauna.

Mitigation measures should be detailed together with pro-active and predictive operational and maintenance strategies that could be used to prevent and mitigate impacts.

Potential air quality impacts from emissions, must be discussed with reference to the *National Environmental Protection Measures (NEPM) for ambient air quality* (1998) and the *Environmental Protection (Air) Policy 2008*. If an emission is not addressed in these legislative instruments, the emission should be discussed with reference to its risk to human health, including appropriate health-based guidelines/standards.

The EIS must assess the alternative in the event that the power infrastructure will not be built. Accordingly, the EIS must cover all off-gas and heat emissions and specifically include detailed information on redundancy measures associated with air emissions control technology.

3.6 Greenhouse gas emissions

3.6.1 Description of environmental situation

This section of the EIS should 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, where '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, where '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.

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

3.6.2 Potential impacts and mitigation measures

This section of the EIS should discuss the potential for greenhouse gas abatement measures. This may include:

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

3.7 Noise and vibration

3.7.1 Description of environmental values

This section should describe the existing noise and vibration environment that may be affected by the project in the context of environmental values as defined by the *Environmental Protection (Noise) Policy 2008*. The DERM's Noise Measurement Manual should be considered and references should be made to the *EPA Guideline Noise and Vibration from Blasting* (if relevant).

Sensitive noise receptors adjacent to all project components should be identified and typical background noise and vibration levels estimated based on surveys at representative sites. The potential sensitivity of such receptors should be discussed and performance indicators and standards nominated.

3.7.2 Potential impacts and mitigation measures

The EIS should describe the impacts of noise and vibration generated during the construction and operational phases of the project. An analysis of noise and vibration impacts 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 200Hz) and vibration at all potentially sensitive receivers compared with the performance indicators and standards nominated above
- impact on terrestrial and aquatic fauna
- proposals to minimise or eliminate these effects, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise and vibration.

3.8 Waste

3.8.1 Waste generation

The EIS should 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. This section should describe:

- waste generated by delivery of material to site(s)
- 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.

3.8.2 Waste management

Having regard for best practice waste management strategies and the *Environmental Protection (Waste Management) Policy 2000* and the *Environmental Protection (Waste Management) Regulation 2000*, this section should assess the potential impact of all wastes generated during construction and operation and provide details of each waste in terms of:

- the options available for avoidance
- 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 minimize attraction of vermin, insects and pests
- market demand for recyclable waste (where appropriate)
- decommissioning of the construction site.

3.9 Transport

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

3.9.1 Existing Infrastructure

The extent condition and capacity of the existing transport infrastructure on which the project will depend should be described.

3.9.2 Transport tasks and routes

This section should 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 transport network (volume, composition, trip timing and routes)
- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- likely heavy and oversize/indivisible loads (volume, composition, timing and routes) highlighting any vulnerable bridges and structures along proposed routes.

3.9.3 Potential impacts and mitigation measures

Impact assessment reports should include:

- the assessment methodology adopted (for impacts on roads: *The Road Impact Assessment Report (RIA)* in general accordance with *DMR Guidelines for Assessment of Road Impacts of Development 2006*.

The impact assessment should include project impacts on:

- capacity, safety, local amenity, efficiency and condition of transport operations, services and assets (from either transport or project operations)
- possible interruptions to transport operations
- the natural environment within the jurisdiction of an affected transport authority (for example road and rail corridors)
- the nature and likelihood of product-spill 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, Part 2A of the *Transport Planning and Coordination Act 1994*
- accessibility to transport for people with a disability.

3.9.4 Infrastructure alterations

The EIS should 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.

3.9.5 Transport management strategies

BGD is to discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. These mitigation strategies are to be prepared by BGD in close consultation with relevant transport authorities and include consideration of those authority's works program and forward planning.

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

3.10 Indigenous cultural heritage

3.10.1 Description of existing Indigenous cultural heritage values

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

The Indigenous cultural heritage survey should:

- refer to the DERM Indigenous Site Database and any existing literature relating to the affected areas
- consult with traditional owners regarding field surveys and reach outcomes about significant Indigenous objects and significant Indigenous areas and confidentiality of culturally sensitive information
- identification of locations of culturally significant sites likely to be impacted by the project, including:
 - stone artefact scatters
 - culturally significant vegetation
 - buildings or places of archaeological significance
 - archaeological sites, natural sites, story sites etc.
- provide a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, (having due for any confidentiality requirements specified by community representatives).

3.10.2 Potential impacts and mitigation measures

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

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

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

In the absence of a native title agreement the preparation of a Cultural Heritage Management Plan (CHMP) should be initiated during the EIS process. If a CHMP has not been approved by the time of submission of the EIS to the Coordinator-General then the following should be provided:

- an outline of the draft CHMP, subject to any confidential provisions, outlining the position of the endorsed cultural heritage parties
- details of the proposed steps and timeframes for seeking ratification of the CHMP.

Preparation of the CHMP must comply with the requirements of the ACH Act.

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

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

3.11 Non-Indigenous cultural heritage

3.11.1 Description of existing non-Indigenous cultural heritage values

The EIS should include a cultural heritage study that describes non-Indigenous cultural heritage sites and places, and their values. Any such study should include the following:

- reference to:
 - 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/organisations (e.g. 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.

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



3.11.2 Potential impacts and mitigation measures

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

- description of the significance of artefacts, items or places of conservation or non-Indigenous cultural heritage value likely to be affected by the project and their values at a local, regional, state and national level
- recommended means of mitigating any negative impacts on non-Indigenous cultural heritage values and enhancing any positive impacts
- strategies to manage places of historic heritage significance, taking account also of community interests and concerns
- As a minimum, investigation, consultation, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care, including those under the EPBC Act and Queensland Heritage Act 1992.

4 Social values and management of impacts

4.1 Social

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

4.1.1 Social and cultural area

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

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

4.1.2 Community engagement

Consistent with national and international good practice BGD 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.

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

4.1.3 Social baseline study

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

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

- major population trends/changes that may be occurring irrespective of the project



- total population (the total enumerated population for the social and cultural area and the full time equivalent (FTE) transient population), 18 years and older
- estimates of population growth and population forecasts resulting from the proposal
- family structures
- age and gender distributions
- education, including schooling levels
- health and wellbeing measures
- cultural and ethnic characteristics
- the Indigenous population including age and gender
- income including personal and household
- labour force by occupation and industry
- housing costs (monthly housing repayments (percent of dwellings in each category), and weekly rent (percent dwellings in each category), housing tenure type and landlord type, household and family type
- housing availability and affordability: the rental market (size, vacancy rate, seasonal variations, weekly rent by percentage dwellings in each category); the availability and typical costs of housing for purchase, monthly housing repayments by percentage dwellings in each category; and the availability of social housing
- disability prevalence
- the social and economic index for areas, index of disadvantage—score and relative ranking
- crime, including domestic violence
- any other indicators determined through the community engagement process as relevant.

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

- the social infrastructure including community and civic facilities, services and networks (for definition see South East Queensland Plan 2005-2026 Implementation Guidelines No. 5: www.dip.qld.gov.au/resources/guideline/Implementationguideline5.pdf)
- settlement patterns including the names, locations, size, history and cultural aspects of settlement in the social and cultural area
- the identity, values, lifestyles, vitality, characteristics and aspirations of communities in the social and cultural area, including Indigenous communities
- land use and land ownership patterns including:
 - rural properties, farms, croplands and grazing areas including on-farm activities near the proposed activities
 - the number of properties directly affected by the project
 - the number of families directly and indirectly affected by the project including Indigenous traditional owners and their families, property owners, and families of workers either living on the property or workers where the property is their primary employment
- use of the social and cultural area for forestry, fishing, recreation, business and industry, tourism, aquaculture, and Indigenous cultural use of flora and fauna.

4.1.4 Workforce profile

The SIA should include a profile of the workforce which describes:

- the number of personnel to be employed, the skills base of the required workforce and the likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each component of the project
- the estimated number of people to be employed during construction and operation, and arrangements for their transport to and from the project areas, including proposed use of regional or charter air services
- estimates should be provided according to occupational groupings and variations in the workforce numbers for the duration of the project and show anticipated peaks in worker numbers during the construction period.

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

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

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

4.1.5 Potential Impacts

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

- describe and summarise outcomes of community engagement processes including the likely response of the affected communities, including Indigenous people
- include sufficient data to enable affected local and state authorities to make informed decisions about the projects 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 BGD 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, considering the following:
 - key population/ demographic shifts; disruptions to existing lifestyles, the health and social wellbeing of families and communities; social dysfunction including alcohol and drugs, crime, violence, and social or cultural disruption due to population influx
 - the needs of vulnerable groups including women, children and young people, the aged and people with a disability
 - Indigenous peoples including cultural property issues
 - local, regional and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. In relation to the source of the workforce, information is required as to whether BGD, and/or contractors, is likely to employ locally or through other means and whether there are initiatives for local employment business opportunities.

- proposed new skills and training related to the project including the occupational skill groups required and potential skill shortages anticipated
- comment on how much service revenue and work from the project 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. The capability of the existing housing and rental accommodation, to meet any additional demands created by the project is to be discussed including direct impacts on Indigenous people.

The SIA will include an evaluation of the potential cumulative social impacts resulting from the project including an estimation of the overall size, significance and likelihood of those impacts. Cumulative impacts in this context is defined as the additional impacts on population, workforce, accommodation, housing, and use of community infrastructure and services, from the project, and other proposals for resource development projects in the area which are publicly known or communicated by DIP, if they overlap the proposed project in the same time frame as its construction period.

4.1.6 Mitigation measures and management strategies

For identified social impacts, social impact mitigation strategies and measures should be presented to address:

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

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

A draft social impact management plan should be presented that promotes an active and ongoing role for impacted communities and local authorities through the project life cycle. The draft plan should cover:

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



5 Economies and management of impacts

5.1 Economy

5.1.1 Description of affected local and regional economies

This section should describe the existing economy in which the project is located and the economies materially impacted by the project. The description should include:

- 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 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 (wage rates, building costs, housing rent etc)
- provide information on land values in the region by type of use.

5.1.2 Potential Impacts and mitigation measures

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

The analysis should 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
- factor incomes
- 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.



5.1.2.1 Strategies for local participation

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

- strategies for assessing the cost effectiveness of sourcing local inputs from the regional economy during the construction, operation and rehabilitation of the project
- employment strategies for local residents including members of Indigenous communities and people with a disability, including a skills assessment and recruitment and training programs to be offered
- strategies responding to relevant government policy, relating to:
 - the level of training provided for construction contracts on Queensland Government building and construction contracts, with regard to the *Queensland Government Building and Construction Contracts Structured Training Policy* (the 10 percent policy)
 - Indigenous employment opportunities, with regard to the Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (the 20 percent policy)
 - the use of locally sourced goods and services, with regard to the *Local Industry Policy* (Department of State Development, 1999).

5.1.2.2 Impact upon property management

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

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

5.2 Sustainable development

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

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

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

6 Hazard and risk

6.1 Hazard and risk assessment

This section of the EIS should 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:

- identification of potential hazards, accidents, spillages and abnormal events which may occur during all stages of the project, including possible frequency of occurrence
- identification of 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.

A preliminary risk assessment for all components of the project shall be undertaken as part of the EIS process in accordance with *Australia/New Zealand AS/NZS 4360:2004 Risk Management*. With respect to risk assessment:

- the EIS should deal comprehensively with external and on-site risks including transport risks
- the study should assess risks during the construction, operational and decommissioning phases of the project
- analysis of the consequences of each hazard on safety in the project area should be conducted, examining the likelihood of both individual and collective consequences, involving injuries and fatalities to workers and to the public
- quantitative levels of risks should be presented (where possible) from the above analysis.

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

A comparison of assessed and mitigated risks with acceptable risk criteria for land uses in and adjacent to the project area should be presented.

A draft risk management plan should be presented.

6.2 Health and safety

6.2.1 Description of public health and safety community values

This section should 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, dust, noise and water.

6.2.2 Potential impact and mitigation measures

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



The EIS should assess the cumulative effects on public health values as well as occupational health and safety impacts on the community and workforce from project operations and emissions. Practical monitoring regimes should be recommended in this section.

6.3 Emergency management plan

The development of emergency planning and response procedures is to be determined in consultation with state and regional emergency service providers.

An outline of the proposed integrated Emergency Management Planning procedures is to be provided (including evacuation plans, if required) for the range of situations identified in the risk assessment developed in this section, including strategies to deal with natural disasters during operation and construction.

7 Cumulative impacts

The purpose of this section is to provide a summary of the cumulative impacts from the project and to provide a description of these cumulative impacts both in isolation and in combination with those of existing or proposed project(s) publicly known or advised by DIP to be in the region, to the greatest extent practicable. Cumulative impacts should be assessed with respect to both geographic location and environmental values. The methodology used to determine the cumulative impacts of the project should be presented, detailing the range of variables considered, including where applicable, relevant baseline or other criteria upon which the incremental aspects of the project have been assessed.

8 Environmental management plan

This section should detail the environmental management plans (EMP) 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 sections of the EMP must address discrete project elements and must provide life-of-proposal control strategies. The EMP 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:

- BGD'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 (i.e. specified limits to pre- selected indicators of change).
Auditing:	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
Reporting:	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective action:	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

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

9 Conclusions and recommendations

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

10 References

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

11 Appendices

11.1 Final TOR for this EIS

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

11.2 TOR cross-reference table

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

11.3 Development approvals

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

11.4 Consultation report

The report should include the methodology used in the community consultation program 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) should be provided. A summary of the issues raised by stakeholders and the means by which the issues have been addressed, should be provided. Plans for ongoing consultation should be outlined and included in the EMP.

11.5 Study team

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

11.6 Glossary of terms

A glossary of technical terms and should be provided.



11.7 Specialist studies

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

- air pollution, noise and vibration
- groundwater
- geology
- economic studies and/or cost-benefit analyses
- hazard and risk studies
- land use and land capability studies.

11.8 Corporate environmental policy

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

11.9 List of proponent commitments

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

