

**SPRING GULLY
POWER STATION**

TERMS OF REFERENCE

FOR

ENVIRONMENTAL IMPACT STATEMENT

QUEENSLAND

**DEPARTMENT OF STATE DEVELOPMENT
and INNOVATION**

May 2005

TABLE OF CONTENTS

PREFACE	1
PART A: INFORMATION AND ADVICE ON PREPARATION OF THE EIS	4
Introduction	4
EIS Objectives	4
Main EIS Guidelines	5
Stakeholder Consultation	5
General EIS format	5
PART B: SPECIFIC REQUIREMENTS – CONTENTS OF THE EIS	7
Executive Summary	7
Glossary Of Terms	8
1. INTRODUCTION	9
1.1 Project Proponent	9
1.2 Project Description	9
1.3 Project Objectives and Scope	9
1.4 The Environmental Impact Statement (EIS) Process	9
1.4.1 Submissions	10
1.5 Public Consultation Process	10
1.6 Project Approvals	11
2. PROJECT NEED AND ALTERNATIVES	12
2.1 Project Justification	12
2.2 Alternatives to the Project	12
3. DESCRIPTION OF THE PROJECT	13
3.1 Location	13
3.1.1 Regional Context	13
3.1.2 Local Context	13
3.2 Construction	14
3.3 Operations	14
3.4 Power Station Output	14
3.5 Infrastructure Requirements	15
3.5.1 Transport	15
3.5.2 Energy	16
3.5.3 Water Supply and Storage	16
3.5.4 Stormwater Drainage	16
3.5.5 Telecommunications	16
3.5.6 Workforce and Accommodation	17
3.6 Operating Hours	17
3.7 Waste Management	18
3.7.1 Air Emissions	18
3.7.2 Solid and Liquid Waste	18
3.7.3 Offsite Waste Disposal Requirements	18
3.8 Rehabilitation and Decommissioning	18
4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS	20
4.1 Land	20
4.1.1 Description of Environmental Values	20
4.1.2 Potential Impacts and Mitigation Measures	22
4.2 Climate	23
4.3 Water Resources	23
4.3.1 Description of Environmental Values	23
4.3.2 Potential Impacts and Mitigation Measures	24
4.4 Air	26
4.4.1 Description of Environmental Values	26
4.4.2 Potential Impacts and Mitigation Measures	26

4.5	Waste	28
4.5.1	Description of Environmental Values	28
4.5.2	Potential Impacts and Mitigation Measures.....	28
4.6	Noise and Vibration	29
4.6.1	Description of Environmental Values	29
4.6.2	Potential Impacts and Mitigation Measures.....	29
4.7	Nature Conservation.....	30
4.7.1	Description of Environmental Values	30
4.7.2	Potential Impacts and Mitigation Measures.....	31
4.8	Cultural Heritage.....	32
4.8.1	Description of Environmental Values	32
4.8.2	Potential Impacts and Mitigation Measures.....	32
4.9	Social.....	33
4.9.1	Description of Environmental Values	33
4.9.2	Potential Impacts and Mitigation Measures.....	34
4.10	Economy	35
4.10.1	Description of Environmental Values	35
4.10.2	Potential Impacts and Mitigation Measures.....	35
4.11	Infrastructure and Transportation	36
4.11.1	Description of Environmental Values	36
4.11.2	Potential Impacts and Mitigation Measures.....	36
4.12	Hazard and Risk	37
4.12.1	Description of Environmental Values	37
4.12.2	Potential Impacts and Mitigation Measures.....	37
4.13	Public Health	39
4.13.1	Description of the Affected Communities	39
4.13.2	Potential Impacts and Mitigation Measures.....	39
4.14	Cross-reference with the Terms of Reference	39
5.	ENVIRONMENTAL MANAGEMENT PLAN	40
6.	REFERENCES.....	41
7.	RECOMMENDED APPENDICES	42
A1.	Final Terms of Reference for this EIS.....	42
A2	Development Approvals.....	42
A3	The Standard Criteria	42
A4	Research.....	42
A5	Consultation Report.....	42
A6	Study Team	42
A7	Specialist Studies	42

PREFACE

Project Background

Origin Energy Power Limited (here-in-after 'Origin') proposes to establish and operate a gas fired power station at Spring Gully approximately 80 km north-east of Roma, in southern Queensland. The power station will be located at the site of Origin's existing coal seam methane (CSM) project.

The proposed power station is located off the Roma- Taroom Road and is described as Lot 16 on Plan AB174 Parish of Narran. The local government authority is the Bungil Shire Council. The power station will occupy an area approximately 300 m x 500 m (approximately 15 hectares). It will be located within the Spring Gully property owned by Origin (4,500 ha).

The power station at nominal design capacity will produce up to:

- 500 MW of electricity for Stage 1
- 1000 MW of electricity for Stage 2

The power station is expected to be configured as a multiple gas turbine/steam turbine combined cycle plant fired by coal seam methane from the adjacent Spring Gully coal seam gas plant. It will operate as a base-load generator.

Large quantities of groundwater are produced when coal seam gas is extracted. This water will be the source of cooling water for the power station.

The cost of the power station project is estimated to be approximately \$870 million in total (Stages 1 and 2) with \$435 million allocated for Stage 1 development. The construction workforce will average approximately 200 but will peak at about month 20 at 400. The number of permanent operational personnel will be approximately 30 with up to 17 on site at any one time.

The Co-ordinator General requires Origin to take account of the effects on the environment of the project in accordance with Part 4 of the *State Development and Public Works Organisation Act, 1971*, through the preparation of an Environmental Impact Statement (EIS).

ADMINISTRATIVE DETAILS FOR THESE TERMS OF REFERENCE

The Project was declared to be a "significant project" under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971 (SDPWOA)* by the Coordinator-General (CoG) on 22 December 2004. Matters considered by the CoG in making this declaration included information in an Initial Advice Statement prepared by the Proponents, the level of investment necessary for the Project, employment opportunities provided by the Project, potential impact on the environment, potential effects on relevant infrastructure and the significance of the Project to the region and State. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of this Act, which requires the Proponents to prepare an Environmental Impact Statement (EIS) for the Project.

The Department of State Development and Innovation (DSDI) is responsible for managing the environmental impact assessment process on behalf of the CoG. DSDI has invited relevant Commonwealth, State and Local Government representatives and authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment procedure is the development of Terms of Reference (ToR) for the preparation of an EIS. The process involves the formulation of draft ToR which are made available for Spring Gully Power Station Draft Terms of Reference March 2005

public and government agency comment. The CoG has regard to all comments received on the Draft ToR in finalising the ToR, which will be presented to the Proponents. This document represents the Draft Terms of Reference for public comment.

The statutory impact assessment process under the *SDPWOA* is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. The Proponents have referred the Proposal to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *EPBC Act*, which is administered by the Environment Assessment and Approvals Branch of the Department of Environment and Heritage (DEH). A delegate of the Commonwealth Minister decided, on 8 March 2005, that the Proposal did not constitute a controlled action under Section 75 of the *EPBC Act*.

The Proponents will prepare a draft EIS to address the ToR. Once the EIS has been prepared to the satisfaction of the CoG, a public notice is advertised in relevant newspapers circulating in the district and the State. The notice will state: where copies of the EIS are available for inspection and how it can be purchased; that submissions may be made to the CoG about the EIS; and the submission period. The Proponents may be required to prepare a Supplementary Report to the EIS to address specific matters raised in submissions on the EIS.

At the completion of the EIS phase, the CoG will prepare a report evaluating the EIS and other related material, pursuant to Section 35 of *SDPWOA*. The CoG Report will include an evaluation of the environmental effects of the proposed Project and any related matters. The Report will reach a conclusion about the environmental effects and any associated mitigation measures, taking into account all of the relevant material including: the EIS; all properly made submissions and other submissions accepted by the CoG; and any other material the CoG considers is relevant to the Project, such as a Supplementary Report to the EIS, comments and advice from Advisory Agencies, technical reports on specific components of the Project and legal advice.

The Project involves development that would require an application for development approval for material change of use and/or impact assessment under the *Integrated Planning Act 1997 (IPA)*. Consequently, the CoG Report may, under s.39 of *SDPWOA*, state for the assessment manager one or more of the following:

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

Alternatively the Report must state for the assessment manager –

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

Further, the Report must:

- give reasons for the statements (above); and
- be given to the assessment manager for the application by the CoG.

Development approvals under *IPA* would be sought separately for the power station site.

Further to the above *IPA* approvals, other approvals under the *Environmental Protection Act 1994 (EP Act)*, *Vegetation Management Act 1999*, *Water Act 2000*, *Nature Conservation Act 1992* and *Aboriginal Cultural Heritage Act 2003* are likely to be required.

These ToR provides information in two broad categories:

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

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

Randall Byram
Project Manager – Spring Gully Power Station Project
Project Delivery
Department of State Development and Innovation
PO Box 15168
BRISBANE CITY EAST QLD 4002
Tel: (07) 3238 3114 Fax: (07) 3225 8028
Email: randall.byram@sd.qld.gov.au

*** *The term environment refers to:***

- a) ecosystems and their constituent parts, including people and communities;***
- b) all natural and physical resources;***
- c) the qualities and characteristics of locations, places and areas, regardless of size, that stimulate biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community;***
- d) the social, economic, aesthetic and cultural conditions which influence, or are affected by, the entities and attributes mentioned in paragraphs (a) to (c); and***
- e) the local, regional, Queensland and Australian populations and labour markets.***

PART A: INFORMATION AND ADVICE ON PREPARATION OF THE EIS

Introduction

These Terms of Reference (ToR) for an Environmental Impact Statement (EIS) for Spring Gully Power Station Project have been developed in accordance with the requirements of Sections 29 and 30 of the *State Development & Public Works Organisation Act 1971 (SDPWOA)*. The objective of the TOR is to identify those matters that should be addressed in the EIS. The ToR are based on the initial outline of the proposed Project given in the Initial Advice Statement (IAS).

The State Government, from which the Project Proponent requires approvals, may request additional information on any matter not adequately dealt with in the EIS. In order to clarify the nature and level of investigations that are envisaged in the ToR, the Proponent may contact relevant Government agencies (known as Advisory Agencies), peak community interest organisations and relevant individuals and groups as necessary. However the Coordinator-General (CoG) reserves the final decision on interpretation of the requirements of the ToR.

Reference to any culturally sensitive confidential information should be indicative only and disclosure of any such information must be negotiated with traditional custodians; other confidential information supplied by or to the Proponents must be clearly identified and placed in discrete attachments to the main report.

EIS Objectives

The objective of the EIS is to identify potential bio-physical and socio-economic impacts and to ensure that impacts are acceptable. Impacts (direct, indirect and cumulative) must be examined fully and addressed, so that the development of the Project, including the selection of the preferred sites for each of the Project elements, is based on sound environmental protection and management criteria. Consistent with this objective, the EIS should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts.

The document should provide:

- For interested bodies and persons: a basis for understanding the Project, alternatives and preferred solutions, the existing environment that would be affected, both on and off the sites, the impacts that may occur, and the measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in land: an outline of the effects of the proposed Project on that land including access arrangements.
- For the CoG and other Government decision makers: a framework against which decision-makers are able to consider the environmental aspects of the proposed Project in view of legislative and policy provisions and decide whether the Project can proceed or not; to set conditions for approval to ensure environmentally sound development as appropriate, and where required by legislation, recommend an environmental management and monitoring program.
- For the Proponents: a definitive statement of measures or actions to be undertaken to minimise any adverse impacts during and following the implementation of the proposed Project. A draft Environmental Management Plan that describes acceptable impacts and environmental management strategies to agreed performance criteria is the recommended means of achieving this objective.

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

Main EIS Guidelines

The EIS should relate to the entire life of the Project including construction, operation, maintenance, and decommissioning. The EIS should enable reasonable economic and technically achievable conditions to be developed to ensure that the impact of the Project is reduced to acceptable levels. The level of analysis and detail in the EIS should reflect the level of significance of particular impacts.

The EIS should state the following about information given in the EIS:

- the source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

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

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

Within these ToR, the term “Project” includes all activities associated with the power generation including materials handling, storage and transport facilities and supporting Project infrastructure. Where existing facilities are to be used to support the Project, the potential for a significant increase in environmental impact arising from Project activities is to be discussed. Where there is a likelihood of a significant increase in environmental impact, the impact should be described and detailed.

For the purposes of the EIS, the “Project” does not include any upstream gas extraction development and associated transportation components. Impact assessment for any such development has been undertaken in a separate process.

Stakeholder Consultation

To facilitate the assessment process, the Proponents are strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process.

It is the responsibility of the Proponents, in consultation with Advisory Agencies, to identify legislation, policies and methodologies relevant to the EIS process, and to determine appropriate parts of the community which should be consulted during the EIS preparation stage. It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact assessment process. Copies of the EIS will be provided to all Advisory Agencies and on request to relevant individuals and peak groups with an interest in the Project.

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.

The main text of the EIS is to include appendices containing:

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

Maps, diagrams and other illustrative material should be included in the EIS.

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS should also be produced on CD ROM. CD ROM copies should be in ADOBE® *.pdf format for placement on the internet. All compression must be down-sampled to 72 dpi (or ppi). PDF documents should be no larger than 500 kB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500kB file size.

PART B: SPECIFIC REQUIREMENTS – CONTENTS OF THE EIS

Executive Summary

The function of the executive summary is to convey the most important aspects and options relating to the project to the reader in a concise and readable form. The structure of the executive summary should generally follow that of the EIS, although focused strongly on the key issues and conclusions.

The summary should include the following:

- Title of the project;
- Name and address of proponent/s;
- A brief discussion of the project;
 - project objectives;
 - the purpose of the EIS;
 - the site location and location(s) of associated infrastructure services represented on a map;
 - power station processes;
 - the nature, source and method of transportation of raw materials;
 - water supply requirements and source;
 - energy supply requirements and source;
 - method of transportation of materials to construct buildings and plant, and the proposed route(s);
 - project requirements associated with construction and operation of the project (including workforce infrastructure and social requirements).
- A brief discussion of the alternatives (including location if applicable) and reasons for selecting the preferred option(s);
- A brief description of studies and surveys that have been undertaken for the purposes of developing the project and preparing the EIS;
- Anticipated project schedule timelines and milestones for construction, commissioning, commencement of operation and decommissioning;
- A brief description of the existing environment including physical (natural and built), biological, social, cultural and economic environments;
- A description of the principal impacts on the built and socio-economic environments, including housing for both the construction and operational workforces;
- A description of the principal environmental impacts of the project (both adverse and beneficial);
- A summary of the environmental protection measures, safeguards and monitoring and reporting procedures proposed; and

- Provide a description of how submissions on the EIS can be made.

The EIS will be accessible via the Department of State Development and Innovation's website as part of the public consultation process on the EIS.

Glossary Of Terms

A glossary of technical terms and acronyms should be provided.

1. INTRODUCTION

The function of the introduction is to explain why the Environmental Impact Statement (EIS) has been prepared and what it sets out to achieve. In particular, the introduction should address the level of detail of information required to meet the level and diversity of approvals being sought. It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Factual information contained in the document should be referenced.

The main text of the EIS should be written in a clear, concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. However, detailed technical information, which supports the main text, should be included in appendices to ensure the document is complete and self-contained. The EIS must indicate how studies referred to in the appendices may be independently verified and therefore should include references and a list of organisations consulted. Relevant maps and illustrations should also be included.

1.1 Project Proponent

Details which provide an introduction to the Proponent and its experience in constructing and operating power stations of the proposed type should be included in this section.

Consistent with Section 6 of Schedule 1 of the *State Development and Public Works Organisation Regulation 1999*, the Proponent should provide details of any instances where proceedings relating to an Australian environmental law have been brought against the Proponent. Furthermore, details of the Proponent's environmental policy and planning framework should be described.

1.2 Project Description

A brief description of the key elements of the project should be provided. Any major associated infrastructure requirements should also be summarised. Detailed descriptions of the project should follow in parts 3 and 4.

Diagrammatic representations of the plant layout and processes should be provided.

1.3 Project Objectives and Scope

A brief statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, including alternatives, envisaged timescale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

Describe the current status of the project and outline the relationship of the project to other developments or actions that may relate whether or not they have been approved. The consequences of not proceeding with the project should also be discussed.

1.4 The Environmental Impact Statement (EIS) Process

The EIS process is to be conducted in accordance with Part 4, Division 3 (i.e. Sections 29-35) of the SDPWOA on behalf of the Coordinator-General by the Queensland Department of State Development and Innovation (DSDI).

Origin referred the Proposal to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), which is administered by the Environment Assessment and Approvals Branch of the

Department of Environment and Heritage (DEH). On 8 March 2005, a delegate of the Commonwealth Minister decided that the Proposal did not constitute a controlled action under s. 75 of the EPBC Act.

These processes and the interaction between them should be described in words and diagrams.

A succinct statement should be made of the role and objectives of the EIS. The purpose of the document is to provide public information on the need for, and likely effects of, the project, and to demonstrate that environmental impacts could be managed to protect the environment in an appropriate way.

The role of the EIS in ongoing regulation such as an environmental management plan (EM) plan should also be discussed, with particular reference to the EM plan's role in providing management measures that can be carried over into conditions that would attach to any approval(s), environmental authorities and permits for the project.

1.4.1 Submissions

The reader must be informed as to how public submissions on the draft EIS will be addressed and taken into account in the decision-making process.

1.5 Public Consultation Process

A written consultation strategy should be developed and implemented during the impact assessment process and prior to preparation of the EIS. Consultation objectives should include:

- informing the different interest groups about the project;
- seeking a preliminary understanding of interest group concerns about the project;
- explaining the impact assessment research methodology and how the group's input will influence the decision making process; and
- informing interest groups of findings.

Consultation principles to be followed are:

- discussion should seek to facilitate interest group input into the impact assessment research rather than simply disseminate information;
- information should be presented in a culturally appropriate manner;
- interest groups should be given sufficient time to respond to requests from the consultants;
- meetings should be structured so as not to raise the expectations of particular interest groups in relation to the project during construction and operation.

The information to be provided in the EIS should include:

- participation or consultation activities undertaken in the project formulation and impact assessment. Include a table listing individuals and organizations consulted, dates, locations, the issues raised, and measures taken to address the issues raised;
- methodology of consultation;

- description of the implementation process for identified mitigation strategies, its evaluation and monitoring;
- method of providing ongoing updates to the community on progress of the project. The proponent should identify a key contact person who would specifically liaise with community members, addressing issues and concerns during the construction and operational stages of the project;
- how submissions on the EIS will be addressed ; and
- the mechanism by which matters will be addressed if major new issues are raised or information gaps identified.

1.6 Project Approvals

This section should explain the legislative and policy framework controlling the full life of the project, plus the required approvals/permits and their administering agencies.

2. PROJECT NEED AND ALTERNATIVES

2.1 Project Justification

This section should state the case for what the project aims to achieve and why there is a need for the project. Reference should be made to any environmental, economic and social benefits, including employment and spin-off business development, which the project may provide. Ideally, the project would be discussed in regional, State and national contexts.

2.2 Alternatives to the Project

This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project.

Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and rejecting others. The environmental impacts of each alternative should be summarised and compared.

3. DESCRIPTION OF THE PROJECT

The objective of this section is to describe the project through its lifetime of construction and operation and decommissioning. This information is required to allow assessment of all aspects of a proposal including all phases of the proposal from planning, construction and operation through to decommissioning. It also allows further assessment of which approvals may be required and how they may be managed through the life of the proposal. Rehabilitation details will be discussed as mitigation measures.

3.1 Location

3.1.1 Regional Context

The regional context of the proposal should be described and illustrated on maps at suitable scales.

3.1.2 Local Context

Maps should be provided showing the precise location of the project area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject
- Real property descriptions of land tenures
- the location and boundaries of the project footprint, and
- the location of any proposed buffers surrounding the working areas.

The local context of the project site should be described and illustrated on map with a rectified photo image base at a scale appropriate to illustrate components of the project in relation to the natural and built features of the area. Specific features depicted should include:

- the location and boundaries of the power station;
- the location and boundaries of the gas processing facilities;
- the location and boundaries of any proposed future transmission line infrastructure;
- the location and boundaries of the evaporation ponds;
- the location of revised road alignments and any new roads;
- the route of any water supply pipeline, and any optional routes that were considered and
- the route of any coal seam gas pipelines between the gas extraction plant and the power station.

If the precise route of proposed future infrastructure (i.e. transmission lines) is not known, the areas / easement should be labelled “indicative only”.

The Plan(s) should illustrate surrounding land uses and the location of surrounding residences within a 10 kilometre radius of the power station.

Include a layout plan which indicates the location of buildings, storage areas, car parking areas, vehicular movement areas, proposed runoff control structures, any onsite waste treatment facilities and other areas

which contribute to the operation of the power station. Given that the project involves a two stage development program, Stages 1 and 2 of the Power Station should be clearly differentiated.

3.2 Construction

The extent and nature of the project's construction phase should be described. The description should include the type and methods of construction, the construction equipment to be used and the items of plant to be transported onto the construction site. Any staging of the proposal should be described and illustrated showing site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed in the project construction phase should also be provided with a brief description of where those people may be accommodated.

3.3 Operations

The location and nature of the processes to be used should be illustrated with maps and diagrams, and described in the text. Operational issues to be addressed should include, but may not be limited to:

- a description of the plant and equipment to be employed;
- the capacity of plant and equipment;
- chemicals to be used; and
- measures proposed to contain, remediate and record chemical spills and other similar events.

Process flow-charts / diagrams should be provided that describe all activities, including chemical and mechanical, to be conducted on site (e.g., power generation and transmission, gas handling, water treatment, chemical use and storage, sewage treatment, workshops). Material balances for the power station plant, and the anticipated rates of inputs, along with similar data on products, emissions, and wastes and recycle systems should be included.

Details of any hazardous materials to be stored and/or used in processing should be given including:

- the name of the material and sufficient information to clearly identify it (including the chemical name, the United Nations (UN) number and any trade names);
- the classification of the material according to the Australian Dangerous Goods Code (including packaging group) and any subsidiary risk;
- the maximum quantity of the material in storage and within the process at any one time;
- a plan showing the location of the material within the buildings and on the site; and
- any other information that is relevant.

In addition to details of hazardous materials to be stored and/or used in the power station, provide their Material Safety Data Sheets and environmental toxicity data and biodegradability.

3.4 Power Station Output

Describe the amount of electricity to be generated and how it is to be transmitted from the site.

3.5 Infrastructure Requirements

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

3.5.1 Transport

This section should identify separately, the transportation requirements of the project during the construction and operational phases, including road, rail and transmission lines where applicable. Alternative transportation options should be considered and reasons provided for the selection of preferred options. Further detail of the impacts of alternative transportation options should be provided in part 4.

Information required for the construction phase of the project includes:

- type, number and/or volume of construction inputs and the types of vehicles most likely to be used for transport;
- origin of inputs and transport route proposed;
- number and type of workforce traffic and service vehicles;
- number of trips generated (both light and heavy vehicles);
- details of over-dimension or excess mass loads, including details of transport routes to project site;
- timing and duration of transport;
- new access requirements to State-controlled or local government roads;
- other infrastructure in or across road reserves e.g. pipelines and conveyors; and

Information on the operational phase should include:

- type, number and/or volume of operational inputs and outputs and the type of vehicles most likely to be used for transport;
- origin/destinations of inputs/outputs and transport routes proposed;
- number and type of workforce traffic and service vehicles;
- number of trips generated (both light and heavy vehicles);
- details of dangerous goods/hazardous materials;
- timing of transport; and
- new access requirements to State-controlled or local government roads.

The information may be presented in tabular form in order to facilitate its interpretation. A map should be included identifying the proposed routes and vehicle movements.

Indicate any use which may be made of rail transport and associated facilities. Detail the types of goods carried, frequency and magnitude of rail shipments, their routes and ultimate source or destination. If rail infrastructure is not to be used, include a statement to this effect.

3.5.2 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the proposal. Energy conservation should be briefly described in the context of any Commonwealth, State and local government policies.

Information is required on the project's proposed consumption of natural gas and the proposed methods for supplying this to the power station. Describe the interaction of the Power Station's operations with the operations of the existing Spring Gully gas extraction facility, noting any changes in the intensity of gas project operations.

3.5.3 Water Supply and Storage

Determination of water demand should be made for both the construction and operation phases of the project, including details of:

- water usage within the site and at any other locations associated with the project;
- daily or seasonal peak demand requirements;
- ultimate total annual requirements;
- quality of water required, including proposed monitoring regimes;
- potential sources of water supply;
- estimated rates of supply, both average and maximum flow rates on daily and annual bases;
- the quality (microbiological and chemical) of the sources of water supply;
- feasibility of onsite water recycling and water conservation and management measures proposed;
- proposed methods of water treatment on site, including any waste products; and
- the storage and distribution of water on-site.

This assessment should take into account the requirements of the project for fire fighting or other emergency water supply.

3.5.4 Stormwater Drainage

Provide a description and appropriate scaled maps of the proposed stormwater drainage system and the proposed disposal arrangements, including any discharge locations. Stormwater measures should be described for all areas of potential stormwater contamination, focusing on avoidance and minimization of contamination and treatment for recycling wherever practicable.

3.5.5 Telecommunications

Details of the project's telecommunication requirements, sources and method(s) of reticulation should be provided.

3.5.6 Workforce and Accommodation

Provide a description of the project construction and operating workforce requirements in terms of numbers and skills. An indication of occupations involved in the project should be given. A graph identifying the relationship between workforce numbers and timelines should be provided. Information provided should include:

- direct on-site construction workforce estimates on a time base;
- direct off-site construction workforce;
- direct on-site operations workforce;
- direct off-site operations workforce;
- skills mix of the workforce;
- indirect or flow-on workforce generated by the project's construction and operational workforces; and
- estimate of the number of workers it is anticipated will be sourced locally and hence the number of new workers likely to move to the area.

The methodology used in developing the estimates (including related assumptions) is to be clearly stated. Ensure that estimates of non-local workers and accompanying partners and dependents are included in any population estimates.

Any new skills and training to be introduced in relation to the project should be identified, as well as the need for supplementation of any existing training programs. Adequate provision should be made by Origin for apprenticeship and worker training schemes. Origin should liaise with the Department of Employment and Training when developing strategies for skills development and training.

Provide a description of the likely accommodation needs of the project's workforce based on the workforce demographics. The accommodation details for the construction and operational workforces should be discussed separately with an indication of any overlapping requirements for accommodation. If accommodation is to be provided by Origin, the type and location (including common areas, potable water supply, treatment and storage, facilities provided for food preparation and storage, ablution facilities, access to emergency services and vector or pest management activities and associated recreational facilities) should be detailed. Any accommodation intended for permanent occupancy should be identified. This section should include a brief description of the means of transporting the workforce to and from the project site.

Information provided concerning workforce camps should include

Information on the location of the accommodation relative to the plant and the predicted exposures to all air pollutants and noise during the construction period when workers are accommodated on-site should be included.

3.6 Operating Hours

Describe the expected daily and annual hours of operation of the facility.

3.7 Waste Management

3.7.1 Air Emissions

Provide a complete list of emissions to the atmosphere including SO_x, NO_x, VOC, CO, CO₂, particulates, PM10, PM2.5 and toxic/persistent/hazardous substances. That is, state the concentrations (mg/m³) at standard temperature and pressure, exit velocity, volume flow rate, mass emission rate, and temperature at exit. Also, specify oxygen content of the flue gases.

Modeling for air contaminants, using an appropriate air dispersion model and other reliable analytical software package, with the current air shed study as a basis, can be used to determine the design ground level concentrations.

The projected level of all emissions should include emissions during normal and upset conditions/worst case scenarios (which might include events during the commissioning stage and startup and shutdown operating conditions). Emissions during upset conditions/worst case scenarios should be described by indicating the type of event/s and associated mass emission rate of pollutants and frequency and duration of the event.

Provide an inventory of projected future annual emissions for each Greenhouse Gas and total emissions expressed in CO₂ equivalent terms for Stages 1 and 2.

3.7.2 Solid and Liquid Waste

For each stage of the project (construction and operation) describe the amount and physical and chemical characteristics of solid and liquid waste (including wastewater) produced on site. Where these wastes contain contaminants of a toxic/persistent/hazardous nature and/or are 'regulated', this should be stated in the EIS.

Provide detailed information on the methods of storage, treatment, recycling/reuse and disposal of all wastes generated. Where on-site disposal of liquid waste is proposed, details should be given on design, materials and methods of construction proposed for the disposal area, and erosion control measures to be installed.

3.7.3 Offsite Waste Disposal Requirements

This section should cover the disposal of all site waste for both the construction and operational phases of the project. The location and method of disposal of solid and liquid wastes should be detailed including:

- location of treatment/disposal facilities;
- transport to treatment/disposal facilities; and
- method of waste tracking.

Details of the proposed strategy for waste management should be described in *Section 4 - Environmental Values and Management of Impacts*.

3.8 Rehabilitation and Decommissioning

This section should present the strategies and methods for progressive and final rehabilitation of the environment disturbed by the proposal. The final topography of any excavations, waste areas and water storage sites should be shown. The land use suitability of the various land disturbance types should be described.

The means of decommissioning the proposal, in terms of the removal of plant, equipment, structures and buildings should be described, and the methods proposed for the stabilisation of the affected areas should be given. 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.

4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

The function of this section is to describe the environment which will or may be affected by the project. In each section, consideration should be made of both the project site and other areas to be affected by the project such as roads, transmission line routes, and related land use activities.

4.1 Land

4.1.1 Description of Environmental Values

This section describes the existing environment values of the land area that may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994 and Environmental Protection Policies*.

It should also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.1.1.1 Topography/Geomorphology

A description (including map) should be provided showing the project in perspective to the catchment in which it lies. Areas of environmental significance should be identified and discussed including creeks, rivers, wetlands, and sites of special geomorphologic significance.

Prepare a contour map at an appropriate scale, illustrating the location of the proposed power station and all associated works for its establishment and operation, including stormwater and erosion control works.

4.1.1.2 Geology

The EIS should provide a description, map and a series of cross-sections of the geology of the proposal area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Geological properties that may influence ground stability (including seismic activity, if relevant), occupational health and safety, rehabilitation programs, or the quality of wastewater leaving any area disturbed by the proposal should be described. In locations where the age and type of geology is such that significant fossil specimens (such as of dinosaurs or their tracks) may be uncovered during construction/operations, the EIS should address the potential for significant finds.

4.1.1.3 Soils

A soil survey of the sites affected by the proposal should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials, which will influence erosion potential, storm water run-off quality and site stability. An acid sulphate soil investigation, carried out according to ASSMAC guidelines, should be undertaken. Information should also be provided on soil stability and suitability for construction of proposal facilities.

Soil profiles should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) and Australian Soil Classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the Planning Guidelines: the Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993), and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

4.1.1.4 Native Title

Describe the status of native title with respect to the tenure of the proposed site. Information should include potential for the existence of native title, the tenure history of the site, whether there have been any native title extinguishing events and if native title may continue to exist.

4.1.1.5 Land Use

This subsection should describe the classification of the uses of the site within the Bungil Shire Town Planning Scheme.

A map showing existing land use should be provided covering the area affected by the project. Provide a map showing agricultural land classes as defined in the “Planning Guidelines for the identification of Good Quality Agricultural Land”. Include the location of other features such as:

- existing dwellings;
- zoning of land;
- local government planning controls and local laws; and
- owners of all tenures - Crown and freehold land, reserves, roads and road reserves, stock routes and the like, over and around the proposed project.

Locate on a map, the nearest townships and their proximity to the project site. This subsection should summarise any regional planning strategies in place or intended in the near future. Reference should be made to any Strategic Plans for the individual local government areas in the region.

4.1.1.6 Sensitive Environmental Areas

The EIS should identify whether areas that are environmentally sensitive could be affected, directly and indirectly, by the proposal.

In particular, the EIS should indicate if the land affected by the proposal is, or is likely, to become part of the protected area estate, or is subject to any treaty.

Describe and discuss issues of proximity to the following areas (where relevant):

- national parks;
- conservation parks;
- wilderness areas;
- aquatic reserves;
- heritage/historic areas or items;
- national estate listings;
- world heritage listings;
- sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA);
- fish habitat areas;

- areas of cultural significance; and
- scientific reserves.

4.1.1.7 Scenic Values

Describe the existing scenic values of the area in terms of the extent and significance of the existing skyline as viewed from places of residence, work, and recreation, from road, cycle and walkways, from the air and other known vantage points day and night, during all stages of the project as it relates to the surrounding landscape is to be analysed and discussed. The assessment is to address the local and broader visual aspects of the project area using appropriate simulation. Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations.

An assessment of the existing lighting environment of the project area should be undertaken with particular reference to:

- the visual aspect at night; and
- night lighting environment / habitat of fauna, flora, residents and businesses;

4.1.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing land 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.

4.1.2.1 Land Contamination

The EIS should describe the possible contamination of land from aspects of the proposal including waste and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the *Queensland Environmental Protection Act 1994*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined.

The EIS should address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from project activities. The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland can be downloaded from the EPA website at: www.epa.qld.gov.au/environment/business/contaminated. Proponents should refer study proposals to the EPA for review prior to commencement (Consult with the Contaminated Land Section in the Queensland EPA).

4.1.2.2 Soil Erosion

Provide an assessment of likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas such as: the power station site, including associated buildings, access roads; waste disposal areas; and workforce accommodation facilities.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to preventing soil loss in order to maintain land capability, and preventing degradation of local watercourses by suspended solids. Slopes and batter angles should be clearly shown in plans, and details provided on runoff management arrangements. Particular attention to potential erosion during construction should be made. An erosion control plan should be prepared for the construction stage of the project.

4.1.2.3 Scenic Values

All impacts of the project on the visual amenity, visual quality and landscape character of the site and the surrounding area are to be considered on both the broad and local level. Describe how the potential impacts of the project on the visual quality and landscape character of the site and the surrounding area are to be mitigated or avoided.

Particular reference should be made to the following:

- impacts on existing land use that contribute to the character of the local area;
- potential impacts to scenic amenity of any conservation area (eg National Park);
- the visual absorption capacity of the site – its ability to absorb the impact of the proposed development; and
- the visual impact at night;

The EIS should include an appropriate simulation to portray broad and near views and impacts of the project on the visual amenity of visually sensitive areas (including areas of local, regional, State-wide, national and international significance). The simulation will portray the significance of the impact on the skyline, and its prominence, as viewed from known vantage points.

4.2 Climate

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect air quality within the environs of the proposal. Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the proposal site. The vulnerability of the area to natural or induced hazards, such as floods and bushfires, should also be addressed. The relative frequency, magnitude and risk of these events should be considered.

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed in Section 4.1. The impacts of winds and temperature inversions on air quality should be addressed in Section 4.4.

4.3 Water Resources

4.3.1 Description of Environmental Values

This section describes the existing environment for water resources, which may be affected by the proposal, in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection Policies*.

4.3.1.1 Surface Waterways

Provide a description of the surface water quality and quantity in the region of the project with an outline of the significance of these waters to the river catchments in which they occur. Provide a description and map at an appropriate scale, in relation to the project, of the following:

- any aquatic features within or adjacent the site (including wetlands, waterways, drainage channels, intermittent water features, dams, man-made channels etc.);
- likelihood and history of flooding on the site including extent, levels and frequency. Include a range of annual exceedance probabilities for affected waterways where data permit;

- present and potential water uses; and
- existing biological, physical and chemical composition of surface waters likely to be affected by the proposed development. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the project (if relevant). Seasonal variations or variations with flow should be described where applicable.

4.3.1.2 Groundwater

The EIS should review the quantity and significance of groundwater in the project area, together with groundwater use in neighbouring areas and the possible significance of the project to groundwater quality, depletion or recharge.

Biological, physical and chemical composition of groundwater in the project area should be described.

4.3.2 Potential Impacts and Mitigation Measures

This section is to 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.

The EIS should describe the possible environmental harm caused by the proposed proposal to environmental values for water as expressed in the Environmental Protection (Water) Policy.

4.3.2.1 Surface Water and Water Courses

The potential environmental impact to the flow and the quality of surface waters from the construction and operational phases of the project should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian or wetland areas. Refer to the *Environmental Protection (Water) Policy 1997* and *Water Act 2000*.

Identify the effects the following items will have:

- cut and fill operations during the earthworks component of the construction phase;
- clearing or any other alterations to existing topography and landform;
- runoff from hard surfaces;
- stormwater quality;
- soil erosion;
- accidental spills;
- cooling tower blowdown water discharge/disposal;
- sewage treatment; and
- other wastewater discharges.

Quality characteristics discussed should be those relevant to the materials on site and activities undertaken, appropriate to the environmental values and water uses. The discussion should refer to the need or otherwise for any discharge to be covered by a license under the *Environmental Protection Act 1994 (Queensland)*. Discuss the chemical and physical properties of any water/liquid discharge (including mass Spring Gully Power Station Terms of Reference May 2005

loads and concentrations of constituents) at the point of entering natural surface waters, along with toxicity and any other adverse effects to flora and fauna. The *Environment Protection (Water) Policy* should be used as a reference for evaluating the effects of various levels of contamination.

Reference should be made to water quality standards consistent with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).

In relation to water supply and usage and wastewater disposal, the EIS should discuss anticipated flows of water to, within and from the site under critical conditions, including the consequences of failure (under such conditions) of proposed pollution control works. Where dams, weirs or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (droughts, floods) upon:

- the structural integrity of the containing walls;
- the quality of the contained water;
- potential for overflows; and
- flows and quality of any water discharged.

Traditionally power stations have used CCA treated wood cooling slats and copper tubing in cooling water systems which has led to elevated levels of metals in wastewater from these circuits. Any contaminants (particularly metals) in the blowdown and other waste water discharged to the evaporation ponds should be identified, predications made regarding concentration and fate over the life the project and the potential for impacts (due to these contaminants) should the ponds fail or otherwise discharge should be outlined.

Describe proposed water management controls including monitoring programs which assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the project. The potential for mosquito breeding in any areas with poor drainage or ponding water should also be identified and monitored via the preparation of a Mosquito Management Plan. Reference should be made to *Guidelines to minimise mosquito and biting midge problems in new development areas*, Queensland Health, March 2002.

4.3.2.2 Groundwater

The EIS should include an assessment of the potential impact of the proposal on local groundwater resources.

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the proposal to groundwater depletion or recharge, and propose management options available to monitor and mitigate these effects. The response of the groundwater resource to the progression and finally cessation of the proposal should be described.

An assessment should be undertaken of the impact of the proposal on the local ground water regime caused by the altered porosity and permeability of any land disturbance.

An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be discussed. Australian and New Zealand Guidelines for Fresh and Marine Water Quality and the *Environment Protection (Water) Policy* should be used as a reference for evaluating the effects of various levels of contamination.

4.4 Air

4.4.1 Description of Environmental Values

A description of the existing air shed environment should be provided having regard for particulates and gaseous and odorous compounds. The background levels and sources of suspended particulates, SO_x, NO_x and any other major constituent of the air environment which may be affected by the proposal should be discussed. In particular, discuss the background levels and emissions from the adjacent gas plant.

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

Describe the environmental values of the air shed for the affected areas in terms of the Environmental Protection (Air) Policy.

4.4.2 Potential Impacts and Mitigation Measures

The proponent is required to undertake an impact assessment with relevant inputs of emissions and local meteorology to an air dispersion model to provide estimates of the likely impacts on the surrounding environment. The model inputs should be as detailed as possible, reflecting any variation of emissions with time and including at least a full year of representative hourly meteorological data.

Provide details on the predicted one hour, 24 hour, and annual average ground level concentrations of power station emissions at the site boundary and in nearby residential, agricultural and public access areas.

Information should also include any physical state of gaseous emissions which may influence dispersion behaviour. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modeled where necessary. Consideration should be given to a range of potential upset condition scenarios.

Present the results of the dispersion modeling as concentration contour plots and frequency contour plots. The former shows the spatial distribution of concentrations at a given percentile level (for example, 99.5%) around a source and are useful in showing where worst-case impacts occur. The latter shows the spatial distribution of frequencies with which a given level of air pollution is exceeded. Estimate ground level concentration (GLC) at the nearest sensitive receptor(s) based on 1-hour average for both 99.9 and 99.5 percentile values.

Modelled concentration levels at the “most exposed existing or likely future off-site sensitive receptors” should be compared with the appropriate national and international design standards.

A full description of the air dispersion models used should be included, or a reference provided, and a discussion of the adequacy of the model to handle dispersion influences likely to be experienced at the proposed site. The air quality modeling results should be discussed in light of the limitations and accuracy of the applied model. Reference should also include the possibility for additional air monitoring of future residential, industrial and agricultural developments, based on results from atmospheric dispersion models. Reference also to the possibility for additional/future air monitoring resulting from unforeseen circumstances, such as credible community concerns regarding air emission impacts should also be included. The degree of monitoring required is highly dependent on the proximity of residents and sensitive receptors (eg. schools) and the population of affected areas.

The model input parameters must be based on the actual stack conditions proposed by the proponent for the licence conditions. The proponent must provide stack parameters such as stack height, diameter, temperature, exit velocity and volume flow rate.

Pre and post monitoring of ambient air quality in locations where exposure is predicted to be highest (and not just nearby areas) is required to ascertain the validity of the modeling predictions and hence allow for a more accurate assessment of the potential for impacts on health.

Identify 'worst case' emissions that may occur at start-up, shut-down or during other 'upset' operating conditions. 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(s) between the facility and neighbouring sensitive land uses will be adequate.

4.4.2.1 Objectives for Air Emissions

The objectives for air emissions should be stated in respect of proposed achievable emission standards, relevant emission guidelines, and any relevant legislation, and the emissions modeled using a recognised atmospheric dispersion model.

The proposed levels of emissions should be compared with the "national environmental protection measures for ambient air quality (1998)", the "National Health and Medical Research Council (NHMRC) national guidelines for control of emissions from stationary sources" (1985), and the *Environmental Protection (Air) Policy*.

4.4.2.2 Predicted Impacts

In predicting impacts on the air environment, separate consideration should be given to the construction and operation phases of the development. Any impact potential should be addressed in the light of relevant standards (emission and ground level concentrations) and any relevant strategies and agreements.

The potential for interaction between the emissions from the power station and any emissions from the coal seam gas extraction plant should also be detailed.

4.4.2.3 Mitigation Measures

Mechanical design and operational management features of the project designed to minimise emissions such as the pollution control technology should be detailed, particularly in terms of efficiency and reliability.

4.4.2.4 Greenhouse Gases

An assessment of greenhouse gas emissions associated with all aspects of the construction and operation of the project should be provided. An inventory of projected future emissions expressed as total mass per annum and as mass per megawatt hour, for individual gases (including fugitive methane), and combined annual emissions in CO₂ equivalent terms.

This information should include:

- the intended measures to avoid, minimise and/or offset greenhouse emissions;
- the results of an analysis of comparable fuels and technologies to allow assessment of the degree to which the selected options minimise greenhouse emissions and achieve energy efficiency with a view to achieving best practice environmental management; and
- methodologies by which estimates were made.

The above assessment should be undertaken with due consideration of relevant protocols, agreements and strategies including "The National Greenhouse Strategy", "National Greenhouse Gas Inventory", and "The Framework Convention on Climate Change".

4.5 Waste

This section should complement other sections of part 4 of the EIS by providing technical details of waste treatment and minimisation, with proposed emission, discharge and disposal criteria, while other sections describe how those emissions, discharges and disposals would impact on the relevant environmental values. The purpose of this format is to concentrate the technical information on waste management into one section in order to facilitate its transfer into an Environmental Management Plan.

4.5.1 Description of Environmental Values

This section describes the existing environment values that may be affected by the project's wastes in the context of Environmental Protection Policies. Refer to each of the waste streams described in Section 3.7 and provide references to environmental values described in other sections of part 4 of the EIS.

4.5.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by wastes, describes how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

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

- operational handling and fate of all wastes including storage;
- on-site treatment methods proposed for the 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;
- proposed discharge/disposal criteria for liquid and solid wastes;
- measures to ensure stability of the dumps and impoundments should be described;
- methods to prevent seepage and contamination of groundwater from stockpiles and/or dumps should be given;
- market demand for recyclable waste (where appropriate) should be addressed; and
- waste minimisation techniques processes proposed.

Having regard for the Environmental Protection (Waste) Policy, the EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during the construction and operating phases of the proposal. The EPA has also released draft guidelines covering aspects of waste management under this EPP, which should be addressed.

Having regard for the requirements of the Environmental Protection (Water) Policy, the EIS should present the methods to avoid stormwater contamination by raw materials, wastes or products and present the means of containing, recycling, reusing, treating and disposing of stormwater. Where no-release water systems are to be used, the fate of salts and particulates derived from intake water should be discussed. Should wastewater reuse be considered as part of the strategy for sustainable water use, it is recommended that the proponent adopts the "South Australian Reclaimed Water Guidelines (Treated Effluent)" and consults the Spring Gully Power Station Terms of Reference May 2005

“National Water Quality Management Strategy for Sewerage Systems (Use of Reclaimed Water)” and draft Queensland Water Recycling guidelines (available from the Environmental Protection Agency).

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly nitrogen oxides, sulphur oxides, particulates and carbon dioxide. Particular attention should be paid to measures, which will maximise energy efficiency and minimise internal energy consumption in the proposal.

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

4.6 Noise and Vibration

4.6.1 Description of Environmental Values

Baseline monitoring should be undertaken at a selection of sensitive sites affected by the proposal. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997. Long-term measured background noise levels that take into account seasonal variations are required. The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Sufficient data should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the night. Monitoring methods should adhere to relevant Environmental Protection Agency Guidelines and Australian Standards, and any relevant requirements of the Environmental Protection (Noise) Policy 1997.

Comment should be provided on any current activities near the proposal area, especially the gas extraction activities, that may cause a background level of ground vibration.

4.6.2 Potential Impacts and Mitigation Measures

Provide baseline noise and vibration monitoring data for the project site. A selection of sensitive areas affected by the project should be included and an assessment made of the potential for health effects.

Report the daily variation of background noise levels at nearby sensitive locations. Monitoring methods should adhere to relevant Environmental Protection Agency guidelines and Australian Standards, and any relevant requirements of the *Environmental Protection (Noise) Policy 1997*. Specific guidelines and standards should be referenced.

Provide comment on any existing activities near the project site that may cause a background level of ground vibration or an elevated background noise.

Background noise monitoring should include low frequency noise if it is likely to be a major component of the noise emissions from the facility. Common sources of low frequency noise are fans and compressors.

4.7 Nature Conservation

4.7.1 Description of Environmental Values

4.7.1.1 Terrestrial Flora

Provide a vegetation map of the site and other areas impacted by the project, at a suitable scale, with descriptions of the units mapped and, where appropriate, quantitative estimates of the population of significant species or plant communities. Mapping should be produced from aerial photographs and ground truthing showing the following where relevant:

- location and extent of vegetation types using the Environmental Protection Agency's regional ecosystem type descriptions in accordance with *The Conservation Status of Queensland's Bioregional Ecosystems* (Sattler P.S. & Williams R.D. 1997) and the Environmental Protection Agency's web site;
- listing the conservation status of regional ecosystems;
- location of vegetation types of conservation significance based on Environmental Protection Agency'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 requirements of the *Vegetation Management Act 1999*;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate;
- the location of any horticultural crops in the vicinity of the site and
- the existence and location of important exotic or weed species.

Sensitive or important vegetation types should be highlighted and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare, threatened or endangered species should be specifically addressed.

Within each defined vegetation community, a minimum of three sites should be surveyed for plant species as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database;
- the minimum site size should be 20 by 50 metres;
- a complete list of species present at each site should be recorded;
- the relative abundance of plant species present should be recorded;
- any plant species of conservation, cultural, commercial or recreational significance should be identified; and
- specimens of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

Existing information on plant species may be used instead of new survey work provided that the data are derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the EIS.

4.7.1.2 Terrestrial Fauna

The fauna occurring in the area 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 and abundance of animals, including amphibians, birds and reptiles;
- any rare, threatened or endangered species including discussion of range, habitat, breeding, recruitment, feeding and movement requirements and current level of protection;
- habitat requirements and sensitivity to changes (including movement corridors and barriers to movement);
- use of the area by migratory birds; and
- the existence of feral and exotic animals.

The EIS should indicate how well any potentially affected habitats are represented and protected elsewhere.

4.7.1.3 Aquatic Biology

If no aquatic biota surveys/studies have previously been conducted in and downstream of the project area, 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/or associated lacustrine environments. The description of the fauna and flora present or likely to be presented in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area, and/or those in any associated lacustrine environment;
- any rare or threatened marine species;
- aquatic plants;
- aquatic and benthic substrate; and
- habitat downstream of the project or potentially impacted due to currents in associated lacustrine environments.

4.7.2 Potential Impacts and Mitigation Measures

Discuss all foreseen direct and indirect effects on flora and fauna. The existence of rare and endangered species should be taken into account. The potential impacts on flora and fauna should be described with specific reference to any impact on sensitive vegetation communities.

Indicate if the project is likely to affect ecosystem function or fauna habitat values, either directly or indirectly.

Alterations to the local surface and groundwater environment could potentially have adverse effects on fauna, and these should be investigated and discussed with specific reference to environmental harm to riparian, aquatic or other sensitive vegetation communities. Effects may include direct effects such as the Spring Gully Power Station Terms of Reference May 2005

destruction or contamination of habitat, or the inhibition of normal movement, propagation or feeding patterns, to indirect effects such as the disruption of food chains or changes to flow patterns or water quality in the local creek system. Measures to mitigate these effects should be described, including provision of buffer zones and movement corridors.

Effects on vertebrates and invertebrates should always be considered if sensitive or rare species may be affected. The discussion of vertebrates should focus on species, while invertebrates may be discussed at the genus or family level, provided there are no rare or endangered species involved.

Weed control strategies and feral animal management strategies should be addressed.

4.8 Cultural Heritage

4.8.1 Description of Environmental Values

This section describes the existing cultural heritage values that may be affected by the proposal. Describe the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.

A cultural heritage study may be required that will describe Indigenous and non-Indigenous cultural heritage sites and places, and their values. In accordance with the *Aboriginal Cultural Heritage Act 2003 (Qld)*, such a study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with relevant Indigenous community/communities concerning:
 - places of significance to that community (including archaeological sites, natural sites, story sites etc);
 - appropriate community involvement in field surveys;
- any requirements by communities and/or informants relating to confidentiality of site data must be highlighted. Non-Indigenous communities may also have relevant information;
- a systematic survey of the proposed development area to locate and record Indigenous and non-Indigenous cultural heritage places;
- significant assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values;
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations; and
- a permit to conduct the research and survey will be required under the provisions of the *Aboriginal Cultural Heritage Act 2003 (Qld)*.

4.8.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values, describes how nominated quantitative standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

Impacts on cultural heritage values in the vicinity of the project should be managed under a cultural heritage management plan (CHMP) developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological and/or anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

- a process for including Aboriginal/Torres Strait islander people associated with the development areas in protection and management of Indigenous cultural heritage;
- identification of the relevant Aboriginal people who claim an interest, and state who has been consulted on the preparation of the CHMP.
- 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; and
- identify the impact of the proposal on native title holders and native title claimants of the area.

The development of the CHMP should be negotiated with all stakeholder representatives, and where there is a role or responsibility identified for Queensland Government agencies, they should be party to the discussions.

Any collection of artefact material as part of a mitigation strategy will need to be undertaken by an appropriately qualified cultural heritage practitioner holding a permit under provisions of the *Aboriginal Cultural Heritage Act 2003 (Qld)*. The DNRM regional manager should be consulted for the provision of general advice including the appropriate conduct of cultural heritage surveys and the necessary permits.

Aspects of the above matters may be referred to the Land and Resources Tribunal and some may also involve native title considerations.

4.9 Social

4.9.1 Description of Environmental Values

Provide written and numerical data in relation to the existing population in the locality and region. The following population characteristics should be examined:

- size;
- age structure;
- gender composition;
- educational status;

- length of residency in the locality and regions;
- current labour force characteristics; and
- unemployment trends.

Describe the existing community facilities available in the local area and region including recreational, health (both private and public), educational, police and emergency services.

Describe the existing workforce accommodation available in the area. Describe the type and location of any housing referred to, including its condition and usual use.

Information regarding the current utilisation and available capacity of these facilities should be provided. Describe any associated recreational facilities and services that are accessible to workers.

Describe the main recreational / lifestyle activities of the indigenous and non indigenous communities with particular regard for culturally important areas and landscapes.

4.9.2 Potential Impacts and Mitigation Measures

The social impact assessment of the project is to be carried out in consultation with the Department of Families. The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level.

Discuss the impacts of the construction and operational stages of the project on the social infrastructure of the region under the following subsections. Identify and discuss the mitigation strategies proposed to eliminate the potential adverse social impacts. All social infrastructure and services, whether provided by State Government, local government, community organizations or the private sector should be identified and considered in this section.

4.9.2.1 Demography

Discuss the potential impacts on the demographics of the region as a result of the project. An assessment should be made of the potential changes to the local population, based on number, age and gender, as a result of the construction and operational stages of the project.

4.9.2.2 Workforce Accommodation

Discuss the impact of the construction and operational phase workforces on the accommodation in the region including an analysis of the impacts on existing tenants. Assess the additional demand for accommodation, of various types, which may arise in the district as a result of the construction and operational stages of the project. Consider rent levels, the availability of rental housing and security of tenure in the rental market. Provide information on strategies that will be implemented to minimize the impacts described above.

4.9.2.3 Community Facilities

Discuss the potential usage by the workforce and their families of the following facilities in the region:

- community;
- recreational;
- health; and
- education.

The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

4.9.2.4 Police Facilities

Discuss the potential impact of the workforce and their families on the police facilities in the region. The discussion should include the capacity of the existing facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

4.9.2.5 Emergency Services Facilities

Discuss the potential impact of the project on the emergency services facilities in the region. The discussion should include the capacity of the existing facilities to accommodate this usage. Identify any requirements for an increase in personnel and/or infrastructure and plans which are in place or proposed to be put in place pursuant to the Fire, Disaster and Emergency Services legislation. Cumulative impacts from this project and the existing CSM project should be discussed.

4.9.2.6 Community Lifestyle

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

- the ability of both indigenous and non-indigenous people, to live in accordance with their own values and priorities; and
- the use of and access to culturally important areas and landscapes.

4.10 Economy

4.10.1 Description of Environmental Values

Describe the existing economic environment that may be affected by the project. The character and basis of the local and regional economies should be described including:

- economic opportunities (including the existing economic base and economic activity, potential economic opportunities, current local and regional economic trends);
- existing housing market particularly rental accommodation which may be available for the project workforce;
- the availability of suitable land for support industries;
- an overview of activity in the local and regional housing construction sector including the availability of skilled labour; and
- any other known or projected construction projects that will be active in the region during the life of this project.

4.10.2 Potential Impacts and Mitigation Measures

Describe the general economic benefits of the project and any adverse impacts. Attention should be directed to the long and short term positive and negative effects of the project during construction and operation on:

- the land use of the surrounding area;

- local economy;
- regional income and wages;
- regional and state employment; and
- the State economy.

Provide information on the extent to which local and Australian services and goods will be utilised and the industry opportunities which may arise as a result of proceeding with the project. Commitment to the Queensland Government's Local Industry Policy should be stated in this section.

Identify strategies to increase employment opportunities for local people including women, young people and Aboriginal and Torres Strait Islander people.

Any new skills and training to be introduced in relation to the project should be identified. Adequate provision should be made for apprenticeship and worker training schemes. If possible, the occupational skill groups' required and potential skill shortages anticipated should be indicated.

Consideration of the impacts of the project in relation to energy self-sufficiency and security may be discussed. Attention should be directed to the long and short-term effects of the project on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies should be referred to the government for input before undertaking the studies.

For identified impacts to economic values, suggest mitigation and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes should also be recommended.

4.11 Infrastructure and Transportation

4.11.1 Description of Environmental Values

Describe existing infrastructure and transport routes that may be affected by the project.

The location and capacity of existing infrastructure services such as water and sewerage, pipelines, power lines, telecommunication lines, and road and rail transport corridors should be described and mapped where relevant.

For roads that may be significantly affected, a description should be given of:

- relevant features of the existing road such as average width, roughness and drainage; and
- traffic flows including details of traffic composition etc on roads and at intersections.

4.11.2 Potential Impacts and Mitigation Measures

This section should discuss the impact of the project on existing infrastructure services such as water and sewerage, pipelines, power lines, telecommunication lines, and road and rail transport corridors.

In particular the effect of traffic and water runoff impacts generated by various stages of the project on the existing State and local government road network should be examined.

The following matters should be addressed:

- the impact on the community and existing infrastructure of the transport of materials and workers to and from the site during construction and operation;
- the impact of an increase in local population in the area;
- capacity and efficiency of intersections and road networks;
- hazards associated with increased transport movements including the potential road safety impacts and dust and noise hazards for both road users and the community in close proximity to transportation routes. The principal issues are likely to be dust and noise, however potential road safety impacts and hazards posed to pedestrian humans and animals should also be considered;
- transport of plant materials (such as weed seeds or disease) to and from the site during construction and operation;
- impact of increased traffic volume on state controlled roads and local roads;
- impact of water runoff and state controlled and local roads; and
- any need for additional access to or across State-controlled and local government roads;

The proposed means of mitigating potentially adverse effects on infrastructure should be developed in consultation with the relevant agencies.

4.12 Hazard and Risk

4.12.1 Description of Environmental Values

This section describes the potential hazards and risk that may be associated with the proposal during both construction and operation.

Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise.

4.12.2 Potential Impacts and Mitigation Measures

A hazard and risk analysis should be conducted in relation to the use, storage and transportation of hazardous materials associated with the project. These studies should focus on the materials and processes that, in the event of an emergency situation, have the potential to cause injury or damage beyond the boundaries of the facility. All phases of the project should be considered, including construction, commissioning, operation, maintenance and decommissioning under normal and abnormal conditions.

4.12.2.1 Hazard Identification

A hazard identification exercise should be conducted to identify the nature and scale of all hazards at the site. Maps should be provided showing the plant outline, hazardous material store, incident control points, fire fighting equipment etc. The hazard identification process should also consider the impact on the facilities of any natural events such as earth tremor, local flooding or bushfire.

Any changes in operating or storage procedures that would reduce the possibility of the identified events occurring, or reduce the severity of the event if they do occur, should be identified and adopted where appropriate.

4.12.2.2 Hazard Analysis

A set of representative incidents from the hazard identification exercise should be selected for further analysis. This set should cover the entire range of possible incidents and should include worst case scenarios.

A preliminary analysis of the consequences of these incidents on people and property should be conducted to identify potential impacts.

All legislation, standards and codes of practice in relation to the storage and handling of hazardous materials should be identified. The proponent should take particular note of the obligations regarding “large and dangerous goods locations” specified in the *Dangerous Goods Safety Management Act 2001*.

4.12.2.3 Risk Analysis

If the hazard analysis shows significant off-site impacts, a risk analysis should be performed. This will require an evaluation of the likelihood of each incident occurring in order to calculate the level of risk to surrounding areas due to the presence of the power station. Risk contours should be presented on a suitably scaled location map. The acceptability of the risk to surrounding land uses should be assessed by referring to nationally adopted risk criteria for fatality, injury, and irritation presented in the New South Wales Department of Urban Affairs and Planning’s *Hazardous Industry Planning Advisory Paper No. 4 “Risk Criteria for Land Use Safety Planning”* (HIPAP 4).

4.12.2.4 Risk Prevention and Management

Provide an overview of safety management strategies and control measures to be used to minimise the risks of incidents at the power station site to minimise the consequences of any incident under all operating conditions.

4.12.2.5 Emergency Planning

Provide details of emergency planning procedures to be adopted, in the form of a Draft Emergency Response Plan. Access to emergency services by people and access by emergency service vehicles should be recognised. Consideration should be given for the period of construction having a QAS presence – ECP / Advanced Care Officer stationed on-site. The ability of emergency service personnel to move within the site and access to emergency service facilities should also be considered. The Draft Emergency Response Plan should meet the requirements set out in the *Dangerous Goods Safety Management Act 2001* and be prepared for both construction and operational periods.

The document *Emergency Plans: Guidelines for Major Hazard Facilities* published by the Chemical Hazards and Emergency Management (CHEM) Unit and Queensland Fire and Rescue Authority in October 1996 should be consulted when preparing the Draft Emergency Response Plan.

4.12.2.6 Workplace Health and Safety Program

Details should be provided in relation to workplace health and safety issues, including design, construction and operational stages of the project.

Reference should be made to the relevant legislation, advisory standards and industry codes of practice covering the workplace health and safety of employees, visitors to the site and members of the public in the surrounding area.

Additional measures taken beyond the scope of meeting legislative obligations should be described, for example health assessment or education programs.

4.13 Public Health

4.13.1 Description of the Affected Communities

The nearby and potentially affected populations should be identified and described. This should include key sensitive receptors, such as children and the elderly within a 10km radius.

4.13.2 Potential Impacts and Mitigation Measures

Any impacts that the proposal may have on the health of the community should be detailed in terms of health, safety, quality of life from factors such as:

- land
- water resources,
- air emissions,
- odour,
- wastes,
- noise and vibration,
- fire
- transport.

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

The EIS should assess the effects of occupational health and safety risks on the community in terms of health, safety, and quality of life from project operations and emissions.

Measures to control mosquito and biting midge breeding need to be described.

Practical monitoring regimes should also be recommended in this section.

4.14 Cross-reference with the Terms of Reference

This section provides a cross reference of the findings of the relevant sections of the EIS, where the potential impacts and mitigation measures associated with the project are described, with the corresponding sections of the ToR.

5. ENVIRONMENTAL MANAGEMENT PLAN

The EIS is a relevant document for many subsequent applications for later approvals. The EIS should include copies of the various draft environmental management plans associated with the development.

These management plans should describe all monitoring and reporting programs and implementation responsibilities.

A draft Environmental Management Plan (EMP) should be consistent with detailed guidelines provided by the Environmental Protection Agency. Information should be provided in such detail as to assist in the development of contractors work plans and support any required development applications.

The draft EMP is intended to carry forward impact assessment recommendations and to establish linkages to licences and approvals. The aim is to ensure that performance criteria are nominated as early in the design phase as possible so that engineering design is directed by an environmental management outcome rather than attempting to accommodate performance criteria.

The draft EMP should:

- provide evidence of practical and achievable plans for the management of the project;
- ensure that environmental requirements are complied with, by producing an integrated planning framework for comprehensive monitoring and control of construction and operational impacts (specific commitments on strategies and design criteria to be employed should be given);
- provide regulatory authorities and the proponent with a framework to confirm compliance with their policies and requirements;
- provide the community with evidence of the management of the project in an environmentally acceptable manner; and
- be periodically updated to reflect knowledge gained during the course of operations. Changes to the management plan should be implemented in consultation with the relevant authorities.

In general the draft EMP should contain a detailed list of commitments by the proponent in respect of environmental protection. Essential components to be included are:

- establishment of agreed performance criteria and objectives in relation to environmental and social impacts;
- prevention, minimisation and mitigation measures for environmental impacts at specific sites;
- proposed monitoring of the effectiveness of remedial measures against the agreed performance criteria in consultation with relevant government agencies and the community;
- details of the funding and implementation responsibilities for environmental management;
- timing of environmental management initiatives; and
- reporting requirements and auditing responsibilities for meeting environmental performance objectives.

The structure of the draft EMP may be set out as follows:

Element	Aspect of construction or operation.
Policy	The environmental policy that applies to the element.
Performance Criteria	The performance criteria for each element of the operation.
Strategy	The methods that will be implemented to achieve the performance requirements.
Monitoring	The monitoring requirements which will measure actual performance.
Reporting	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective Action	The action(s) to be implemented in case a performance criterion is not reached and the person(s) responsible for action.

6. REFERENCES

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

7. RECOMMENDED APPENDICES

A1. Final Terms of Reference for this EIS

A copy of the final ToR should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the ToR at least should be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the ToR to the relevant section of the EIS, should also be provided in Section 4.13 of the EIS. For this purpose the ToR should be line numbered.

A2 Development Approvals

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

A3 The Standard Criteria

A brief summary of the proposals compatibility with ESD policy and other relevant policy instruments such as the standard criteria as defined by the *Environmental Protection Act (Qld)* should be presented. Consideration should focus on the National Strategy for Ecologically Sustainable Development, published by the Commonwealth Government in December 1992 (available from the Australian Government Publishing Service). Each principle should be discussed and conclusions drawn as to how the proposal conforms. A life-of-project perspective should be shown.

A4 Research

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

A5 Consultation Report

A list of referral agencies should be provided in a summary consultation report, which should also list the Commonwealth, State and Local Government agencies consulted, and the individuals and groups of stakeholders consulted.

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

The EIS should describe how 'interested' and/or 'affected persons' (EP Act) and 'affected parties' (EPBC Act) were identified.

A6 Study Team

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

A7 Specialist Studies

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

- Flora and fauna studies;

- Waterway hydrology;
- Groundwater;
- Geology;
- Economic studies, CBA;
- Hazard and risk studies;
- Land use and land capability studies;
- Cultural Heritage; and
- Community Consultation.