Queensland Government
Department of Infrastructure

EMU SWAMP DAM

Stanthorpe Shire Council

Terms of Reference for an Environmental Impact Statement

UNDER PART (4) OF THE QUEENSLAND STATE DEVELOPMENT AND PUBLIC WORKS ORGANISATION ACT 1971

The Coordinator- General, June 2007

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PREFACE

The Stanthorpe Shire Council is the proponent for development of the Emu Swamp Dam project (the Proposal) about 15 kilometres south-west of Stanthorpe on the Severn River. The Proposal comprises a new urban water supply dam on the Severn River (8,000 ML) and pipeline (with associated pump stations) to Stanthorpe; and an option to develop a larger dam (18,000 ML) to provide irrigation water for agricultural producers in the upper Severn River catchment. The decision on whether to construct the urban only or combined urban and irrigation dam has not been made by Council.

Council advised the Coordinator-General (CG) that the key objectives of the development are to:

- develop a new urban water source for Stanthorpe Shire that overcomes the existing urban water deficiencies and provides capacity for anticipated residential and associated industrial and commercial growth;
- participate in a combined scheme (with irrigators) that also develops a new irrigation water source in the upper Severn River catchment. The irrigation water would provide improved security for existing horticultural practices and additional water for expanded agriculture;
- establish and operate a sustainable dam and water pipeline scheme;
- construct and operate a dam and water pipeline scheme that minimises adverse impacts on the surrounding bio-physical and social environments;
- construct and operate a dam and water pipeline scheme that complies with all relevant statutory obligations and with sound environmental management practices; and
- construct, design and operate a dam and water pipeline scheme that does not compromise environmental and social indicators and standards.

The Proposal was declared to be a "significant project" under section 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) by the CG on 5 February 2007. Where this document refers to the Proposal, this should be read as referring to the urban water option (8,000ML) as well as the irrigation/industrial use option (18,000ML) and any relevant pipeline infrastructure.

Matters considered by the CG in deciding to declare this Proposal included information in an Initial Advice Statement prepared by the proponent; relevant planning schemes and policy frameworks; infrastructure impacts; employment opportunities; environmental effects; complexity of local, state and Australian government requirements; level of investment; and the Proposal's strategic significance. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires the proponent to prepare an Environmental Impact Statement (EIS) for the Proposal.

The Department of Infrastructure (DI) is managing the environmental impact assessment process on behalf of the CG. The DI has invited relevant Australian, State and local government representatives and authorities to participate in the process as Advisory Agencies.

The statutory impact assessment process under the SDPWO Act is also the subject of a bilateral agreement between the Queensland and the Australian Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proponent referred the Proposal to the Australian Minister for the Department of Environment and Water Resources in accordance with the provisions of the EPBC Act. The Australian Minister decided, on 3 January 2007, that the Proposal constitutes a controlled action under section 75 of the EPBC Act. Sections 18 & 18A (Listed Threatened Species and Communities) are the controlling provisions under Part 3, Division 1 of this Act.

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 that are made available for public and Advisory Agency comment.

The proponent will prepare an EIS to address the ToR. Once the EIS has been prepared to the satisfaction of the CG, a public notice is to be placed 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 CG about the EIS; and the submission period. The proponent will be required to prepare a Supplementary EIS to address specific matters raised in submissions on the EIS, under the bilateral agreement.

At the completion of the EIS phase, the CG will prepare a report evaluating the EIS and other related material,

pursuant to section 35 of the SDPWO Act. The CG Report will include an evaluation of the environmental effects of the Proposal and any related matters. The CG 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 CG; and any other material the CG considers is relevant to the Proposal, such as the Supplementary EIS, comments and advice from Advisory Agencies, technical reports on specific components of the Proposal and legal advice.

General EIS Format

The EIS should be written in a format matching these ToR or include guidelines (preferably as an appendix) describing how the EIS responds to the ToR. The EIS documentation is also to include:

- maps, diagrams and other illustrative material to assist in the interpretation of the information;
- a list of persons, interest groups and agencies consulted during the EIS;
- a list of advisory agencies consulted with an appropriate contact; and
- the names of, and work done by, all personnel involved in the preparation of 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 plus one copy in word format (unprotected). All compression must be down-sampled to 72 dpi (or ppi). PDF documents should be no larger than one MB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the one MB file size.

Relevance of EIS Process to the Proposal

The Proposal 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 CG report may, under section 39 of SDPWO Act, state one or more of the following for the assessment manager:

- 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 CG report must state for the assessment manager:

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

Further, the CG report must:

- give reasons if the report states that the application for development approval be refused; and
- be given to the assessment manager by the CG.

The relationship between the 'significant project' process under the SDPWO Act and development approval process under the IPA is noted in sections 36 to 42 of the SDPWO Act. Some key points to note include:

- the information and referral stage, and the notification stage of the Integrated Development Assessment System (IDAS) do not apply to development applications to the extent the application is for a material change of use, or requires impact assessment;
- there are no referral agencies under the IPA for the applications to the extent the application is for a material change of use, or requires impact assessment;
- a properly made submission about the EIS is taken to be a properly made submission about the application under IDAS;
- the CG's report is taken to be a concurrence agency's response for the applications to the extent the application is for a material change of use, or requires impact assessment; and

- providing a development application has been made and to the extent the application is for a material change of use, or requires impact assessment, the decision stage does not start until the CG gives the assessment manager a copy of the CG's report.

Further to the approvals that will be sought through the IDAS process, other approvals under a range of legislation including, but not limited to IPA and the *Environmental Protection Act 1994*, are likely to be required.

These ToR provide information in two broad categories:

Part A – Information and Advice on the preparation of the EIS.

Part B – Content of the EIS.

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

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ABBREVIATIONS

The following abbreviations have been used in this document:

ACH Act	*Aboriginal Cultural Heritage Act 2003*
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
BPA	Biodiversity Planning Assessment
CAMBA	China-Australia Migratory Bird Agreement
CG	The Coordinator General of the State of Queensland
CHMP	Cultural Heritage Management Plan
CLR	Contaminated Land Register
DPIF	Department of Primary Industries and Fisheries
DUAP	Department of Urban Affairs and Planning (NSW)
EIS	Environmental Impact Statement, as defined by Part 4 of the *State Development & Public Works Organisation Act 1971*
EM Plan	Environmental Management Plan
EMR	Environmental Management Register
EP Act	*Environmental Protection Act 1994* (Qld)
EPA	Environmental Protection Agency
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999* (C'th)
EPP (Air)	Environmental Protection (Air) Policy 1997
EPP (Noise)	Environmental Protection (Noise) Policy 1997
EPP (Waste)	Environmental Protection (Waste Management) Policy 2000
EPP (Water)	Environmental Protection (Water) Policy 1997
ERA	Environmentally Relevant Activity
ESD	Ecologically Sustainable Development
FSL	Full Supply Level
GQAL	Good Quality Agricultural Land in State Planning Policy 1/92: Development and the Conservation of Agricultural Land.
IAS	Initial Advice Statement, as defined by Part 4 of the *State Development & Public Works Organisation Act 1971*
IDAS	Integrated Development Assessment System
IP Act	Integrated Planning Act 1997 (Qld)
JAMBA	Japan-Australia Migratory Bird Agreement
NC Act	*Nature Conservation Act 1992*
NES	National Environmental Significance
PHA	Preliminary Hazard Assessment
QH Act	*Queensland Heritage Act 1992*
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SDPWO Act	*State Development & Public Works Organisation Act 1971* (Qld)
ToR	Terms of Reference, as defined by Part 4 of the *State Development and Public Works Organisation Act 1971*
VM Act	*Vegetation Management Act 1999* (Qld)

PART A - INFORMATION AND ADVICE ON PREPARATION OF THE EIS

Purpose of the Terms of Reference

These ToR are for an EIS for the Emu Swamp Dam Proposal. These ToR have been prepared in accordance with the requirements of Sections 29 and 30 of the *State Development & Public Works Organisation Act 1971* (SDPWO Act) and incorporate the requirements under the *Environment Protection & Biodiversity Conservation Act 1999* (the EPBC Act).

The objective of these ToR is to identify those matters that should be addressed in the EIS. These ToR are based on the initial outline of the Proposal given in the Initial Advice Statement (IAS). However, the ToR must not be interpreted as excluding from consideration any matters that are currently unforeseen, which may arise during ongoing scientific studies or which may arise from any changes in the nature of the Proposal during the preparation of the EIS, the community consultation process and associated documentation. In such circumstances, these matters must be included in the EIS.

The ToR also provides the framework for the EIS, including information on the purpose and role of the EIS and the factors considered significant for the Proposal. It indicates the types of studies and the data that must be provided in the EIS. All potentially significant impacts of the proposed development on the environment are to be investigated, and requirements for the mitigation of any adverse impacts are to be detailed in the EIS. Any prudent and feasible alternatives must be discussed and treated in sufficient detail. The reasons for selection of the preferred option must be clearly identified. The nature and level of investigations must be relative to the severity of potential consequences of possible events and the likelihood of those events occurring.

The Australian and Queensland Governments, from which the Proponent requires approvals, may request these ToR to be expanded or revised as required to address issues that emerge in the conduct of the EIS process. The CG has ultimate responsibility for decisions on matters of interpretation of the requirements of the ToR and all subsequent changes.

Culturally sensitive information should not be disclosed in the EIS or any associated documents and the disclosure of any such information should only be in accordance with the arrangement negotiated with the traditional custodians. Confidential information to be taken into consideration in making a decision on the EIS should be marked as such and included as a separate attachment to the main report.

An executive summary should be prepared and included in the EIS. It should be a separate document that can be made available to the public.

The EIS must address at least the requirements as set out in these ToR.

EIS Guidelines

The objective of the EIS is to identify potential environmental impacts and to ensure that adverse impacts are avoided where possible. Where unavoidable, impacts must be examined fully and addressed so that the development is based on sound environmental protection and management criteria.

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; and
d) the social, economic, aesthetic and cultural conditions which influence, or are affected by, the entities and attributes mentioned in paragraphs (a) to (c).

When considering the significance of an impact, the proponent must take account of both the intensity of the impact and the context in which it would occur.

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the Proposal. As such, the main text must be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in

appendices. The main text must not assume that a reader would have a prior knowledge of the Proposal site. It must not be necessary for the reader to have visited the site to understand the issues involved in the Proposal.

In brief, the EIS objectives must be to provide public information on the need for and likely effects of the Proposal, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIS.

The EIS process followed will be as specified in the SDPWO Act.

An EIS must provide:

- a description of the relevant aspects of the existing social, economic, natural and built cultural environment;
- a description of the development Proposal and means of achieving the development objectives;
- definition and analysis of the likely impacts of the development on the environment;
- a framework against which Government decision-makers can consider the environmental aspects of the Proposal and set conditions for approval to ensure environmentally sound development;
- a definition of all significant impacts and a consolidated list of measures proposed to mitigate adverse effects; and
- recommendations on the need for and contents of any environmental management plans and/or operational plans to mitigate adverse effects.

EIS Objectives and Key Issues

Objectives

The objectives of the EIS are as follows:

- to provide information on the Proposal and development process to the community and decision makers;
- to comprehensively identify and evaluate all relevant issues associated with the Proposal;
- to identify all potential environmental, cultural, social, transport and land use planning impacts of the preferred concept, and recommend infrastructure and facilities needs together with other design and operational measures required to minimise or compensate for adverse impacts and enhanced benefits;
- to consult with the community and relevant stakeholders in the process of identifying, assessing and responding to the impacts of the Proposal;
- to identify all necessary licences, planning and environmental approvals including approval requirements pursuant to the EPBC Act, IP Act, EP Act, Water Act 2000, Fisheries Act 1994, Nature Conservation Act 1992 (NC Act), Vegetation Management Act 1999 (VM Act) and other legislation; and
- to provide an input to the decision-making process, assisting with the determination of whether to accept or modify the Proposal, approve it with conditions or carry out further studies.

Key Issues

The issues to be addressed as part of the EIS can be divided into the following categories:

- Proposal description, justification and alternatives;
- impacts on the biological environment;
- impacts on the physio-chemical environment;
- impacts on areas of cultural heritage value or Indigenous or non-indigenous significance;
- impacts on surrounding land uses and land use planning;
- social and economic issues, including impacts on local and regional businesses;
- safety and emergency;
- impact on traffic/transport and access; and
- cumulative effects of all key issues.

The EIS will be required to consider in detail relevant issues under each of these categories and all other impacts on the physical and social environment. The information required is described in the following sections.

Public Consultation on Terms of Reference

The draft ToR were publicly notified in the Weekend Australian and Courier Mail newspapers on 31 March 2007; the Stanthorpe Border Post on 3 April 2007 and on the Department of Infrastructure website inviting comment during the period from 2 April to 8 May 2007. The draft ToR were also publicly available for inspection at the Stanthorpe Shire Council offices, 61 Marsh Street, Stanthorpe.

A total of 15 responses to the invitation to comment on the draft ToR were received, including eleven responses from state government agencies and two from community conservation groups and two from private individuals. Copies of all submissions were forwarded to the proponent. The content of all submissions has been reviewed and considered by the CG in finalising the ToR for the EIS for the Proposal. Amendments to the draft ToR, which have arisen from recommendations made in submissions, are referenced in this document as footnotes.

The following is a list of responses and submissions received on the draft ToR:

No.	Agency/Organisation/Individual	Date	Abbrev
1	Department of Emergency Services*	04/05/07	DES
2	Department of Natural Resources and Water	08/05/07	DNRW
3	Department of Local Government, Planning Sport and Recreation*	08/05/07	DLGPSR
4	Mr Rob Simcocks	08/05/07	Simcocks
5	Environmental Protection Agency	08/05/07	EPA
6	Department of Main Roads	08/05/07	DMR
7	Mr Geoff Copland & Ms Karin Perisic	08/05/07	Copland
8	Queensland Health*	08/05/07	QH
9	Queensland Conservation Council	08/05/07	QCC
10	Department of Housing*	08/05/07	DoH
11	Department of Communities*	09/05/07	DLGPSR
12	Department of Primary Industries and Fisheries	09/05/07	DPIF
13	Queensland Transport*	10/05/07	QT
14	Department of State Development*	11/05/07	DSD
15	Toowoomba & Region Environment Council (no comments other than to endorse QCC submission)	14/05/07	TREC

* Note: these government agencies indicated that they did not have any comments on the draft ToR for the Proposal.

PART B - CONTENT OF THE EIS

Executive Summary

The function of the executive summary is to convey the most important aspects and options relating to the Proposal to the reader in a concise and readable form. It must use plain English and avoid the use of jargon and esoteric terms. The structure of the executive summary should follow that of the EIS, and focus strongly on the key issues and conclusions.

The Executive summary should be written as a separable document, able to be reproduced on request and distributed to interested parties who may not wish to read or purchase the EIS as a whole.

Glossary of Terms

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

1 Introduction

The function of the introduction is to explain why the EIS has been prepared and what it sets out to achieve. In particular, the introduction must address the level of detail of information required to meet the level of approval being sought (for example, whether the proponent is seeking only a preliminary approval through the Integrated Development Assessment System (IDAS) or a full approval with all relevant permits). It must also define the audience to whom it is directed, and contain an overview of the structure of the document. Throughout the EIS, factual information contained in the document must be referenced.

1.1 Proposal Proponent

Provide details of the Proposal proponent, including details of any joint venture partners, relevant experience and extent of business activities.

Provide details of any proceedings or other actions under a law of the Commonwealth or a State for the protection of the environment or the conservation and sustainable use of natural resources (an environmental law) against:

- the proponent; and
- the applicant(s) for any permit under an environmental law for the Proposal.

Provide details of the proponent's environmental policy and planning framework.

1.2 Proposal Description

Provide a brief description and illustrations of the key elements of the Proposal. Any major associated infrastructure requirements must also be summarised. Detailed descriptions of the Proposal must follow in Section 3.

Provide a brief description of studies or surveys that have been undertaken for the purposes of developing the Proposal and preparing the EIS. This must include reference to relevant baseline studies or investigations undertaken previously.

1.3 Proposal Objectives and Scope

A 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 time scale for implementation and Proposal life, anticipated establishment costs and actions already undertaken within the Proposal area.

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

Proposal must also be discussed.

1.4 The Environmental Impact Statement (EIS) Process

The purpose of this section is to make clear the methodology and objectives of the environmental impact statement under the relevant legislation.

1.4.1 Methodology of the EIS

This section must provide a description of the EIS process steps, timing and decisions to be made for relevant stages of the Proposal. This section must also indicate how the consultation process (which will be described in detail in Section 1.5) would integrate with the other components of the impact assessment, including the stages, timing and mechanisms for public input and participation. The information in this section is required to ensure:

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

1.4.2 Objectives of the EIS

Having described the methodology of the EIS, a succinct statement must be made of the EIS objectives. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The reader must be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the Proposal.

While the ToR for an EIS provide guidance on the scope of the EIS studies, they must not be seen as exhaustive or limiting. It is important for the proponent and its consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIS of what the EIS studies may find.

If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the ToR are found to be relevant to the assessment of impacts of the Proposal, those matters must be included in the EIS.

In addition, it is essential that the main text of the EIS must address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter must be raised for the first time in an appendix or the draft Environmental Management Plan (EM Plan).

The role of the EIS in providing the Proposal's draft EM Plan must 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 Proposal.

1.4.3 Submissions

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

The reader must also be informed of the standing of any submission they may make in regard to any application submitted by the proponent for statutory approval.

1.5 Public Consultation Process

An appropriate public consultation program is essential to the impact assessment. This section must outline the methodology that will be adopted to identify and mitigate socio-economic impacts of the Proposal. Information about the consultation that has already taken place and the results of such consultation must be provided.

To facilitate the assessment process, the proponent is strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process. This should include consultation with relevant indigenous traditional owner groups and the indigenous community.

It is the responsibility of the proponent, 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 Proposal.

The public consultation program must provide opportunities for community involvement and education. It may include interviews with individuals, information sessions, key stakeholder briefings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local community and interest groups and should continue from project planning through construction, ongoing operation and maintenance. Refer to the Environmental Protection Agency (EPA) guideline "Issue Identification and Community Consultation".

1.6 Proposal Approvals

1.6.1 Relevant Legislation and Policy Requirements

This section must explain the legislation and policies controlling the approvals process. Reference must be made to the SDPWO Act, EP Act, IP Act, and other relevant Queensland laws. In particular, the EIS must demonstrate that the Proposal is consistent with the Water Resources (Border Rivers) Plan 2003, and any subsequent amendments, including that all environmental flow objectives and water allocation security objectives would be met. Any requirements of the Australian EPBC Act must also be included.

Describe the local government planning controls, local laws and policies applying to the development, and a list provided of the approvals required for the Proposal and the expected program for approval of applications.

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

1.6.2 Planning Processes and Standards

This section must discuss the Proposal's consistency with existing land uses or long-term policy framework for the area (e.g. as reflected in local and regional plans), and with legislation, standards, codes or guidelines available to monitor and control operations on site. This section must refer to all relevant state and regional planning policies. This information is required to demonstrate how the Proposal conforms to state, regional and local plans for the area.

Describe any implications to the Proposal that arise from the Queensland Government ceding their rights over management of the Murray-Darling River system to the Australian government.

1.7 Accredited Process for Controlled Actions under Australian Legislation

The Proposal is a controlled action under the Commonwealth's EPBC Act and the Commonwealth has accredited the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of that Act.

The EIS must provide a stand-alone report as an appendix to the EIS that exclusively and fully addresses the potential impacts on the matters of National Environmental Significance that were identified in the 'controlling provisions' when the Proposal was declared a controlled action. These are also noted in the Preface of these ToR. Further guidance on the content of this stand alone report is provided at Appendix A3 of these ToR.

2 Proposal Need and Alternatives

2.1 Proposal Justification

The justification for the Proposal must be described, with particular reference made to the economic viability and

social benefits, including employment and spin-off business development, which the Proposal may provide. The status of the Proposal must be discussed in a regional, state and national context.

The implications of climate change on the Proposal's environmental economic, social feasibility and viability should be discussed.

2.2 Alternatives to the Proposal

This section must describe all alternatives that have been considered, including conceptual, technological and locality alternatives to the Proposal, and discussion of the consequences of not proceeding with the Proposal. Alternatives must be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others.

The process and criteria used for the selection of the specific water storage and infrastructure sites and design must be described. Reasons for selecting the preferred option(s) must include technical, commercial, social and natural environment aspects. The alternatives considered must include:

- demand reduction techniques;
- options for potable water supply only;
- other dam locations and pipeline routes, and associated infrastructure, in particular, discussion of practicable alternatives to the Proposal must include:
    - alternative locations considered, aided by maps and diagrams. The location options highlighting the preferred location for each component of the Proposal must be shown on topographical maps at a suitable scale;
    - a summary of the approval process for the alternative options if those options are subject to different approval processes than the preferred option;
    - the rationale for selection of the preferred location and reasons other options were rejected.
    - alternative water storages eg residential rainwater tanks;
    - a detailed comparative analysis of environmental impacts during construction and post construction, describing the extent and composition of the regional ecosystems affected, either directly or indirectly.

This section must summarise for each alternative:

- the full extent of land that is required or would be directly impacted (e.g. inundated lands);
- comparative environmental impacts;
- the economic costs and benefits to industry and the wider community, including directly affected enterprises;
- the regional social impacts including community disruption, related land use changes, employment, skills development and any workforce accommodation issues.

3 Description of the Proposal

The objective of this section is to describe the Proposal through its lifetime. This information is required to allow assessment of all aspects of the Proposal, including all phases of the Proposal from planning, construction, operation, rehabilitation and decommissioning. It also allows further assessment of which approvals may be required and how they may be managed through the life of the Proposal.

3.1 Overview of Proposal

Provide an overview of the Proposal to put the Proposal into context. Provide a description of the key components of the Proposal through the use of text and design plans where applicable; the expected cost and overall duration and timing of the Proposal; and the employment benefits from the construction and operational phases of the Proposal. Provide a summary of any environmental design features of the Proposal.

3.1.1 Dam

Provide details on aspects of the dam components of the Proposal including:

- Proposed dam type;
- maximum (final) crest height and spillway height;
- length and width of crest;
- extent of excavations for footings and wall construction;
- estimated headwater/tailwater difference at different flows (e.g. 75%, 50% 25%);
- dam capacity, average depth and maximum depth;
- inundation areas (and depth) for a range of water levels (including plan with tenure details and current land use) and the frequency of those inundation levels;
- estimated water yields (with appropriate allowances for environmental requirements);
- general design of outlet works including capacity and offtake level(s);
- any dissipaters at the downstream foot of the barrier;
- any additional water impoundment or control structures that may be constructed as part of the overall Proposal;
- the design and effectiveness of any proposed fishway or other fish transfer mechanisms, drawing on examples used on other dams or similar proposals; and
- the extent of the buffer zone, including any non-irrigation buffer zone around the inundation area.

3.1.2 Pipeline and Associated Infrastructure

Provide details on the following aspects of the pipeline and associated infrastructure (e.g. pump stations and balancing storage) components of the Proposal, including any pipelines and infrastructure associated with delivery of water for irrigation purposes and secondary distribution pipeline infrastructure:

- a map of the preferred route using cadastral and topographical maps at an appropriate scale;
- design parameters covering pipe grade, diameter(s), wall thickness, length, capacity, test and operating pressures, depth of cover of the pipe, cathodic protection, coating and design life;
- criteria for pipeline burial depth and above ground construction, along with pipeline orientation/location within any State-controlled or local government road reserves;
- above ground facilities – physical dimensions and construction materials for surface facilities along the pipeline route including information on pipeline markers;
- details of criteria to assess the minimum depth the pipeline is to be buried under creeks, rivers and ephemeral water ways, in particular any proposed river crossings taking into account Q100 flood events;
- with the aid of maps and diagrams, the location and/or frequency of cathodic protection points, off-take valves, pump stations, balance tanks, control valves (isolation points), pigging facilities (if applicable) and any other Proposal facilities and linkages to existing water supply infrastructure;
- criteria for design and location of any temporary or permanent access crossing for machinery, transport etc across any waterway (e.g. construction of causeways, bridges, culvert crossings etc) and any permanent access points or roads for maintenance purposes, in particular where they are adjacent to waterways. Describe the nature of any permanent access points;

- easement widths and access requirements along the route, including the use of existing areas of disturbance for pipeline access and future maintenance; and
- the expected use of existing water storage and distribution infrastructure.

3.1.3 Water Demand

Provide details on aspects of the water demand associated with the Proposal including:

- required annual urban and irrigation water volumes to meet supply needs;
- water reliability/security requirements;
- proposed water-use efficiency initiatives (e.g.. urban demand management, irrigation efficiency);
- peak load water demands;
- timing of irrigation water requirements;
- any other factors which may have a bearing on irrigation water demands, such as groundwater recharge considerations and other catchment water demands (where appropriate); and
- the expected location for the demand of both urban and agricultural water and the proportion of demand upstream as well as downstream.

3.1.4 Decommissioning

This section should present the strategies and methods for final closure, decommissioning, and rehabilitation of all Proposal elements.

Decommissioning of 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. Information is to be provided on how buildings and structures would be removed or made safe, if left in situ.

Final rehabilitation of the Proposal sites should be discussed in terms of ongoing land use suitability, and any land management issues.

Provide details on the strategic approach to progressive and final rehabilitation, with a view to minimising the amount of land disturbed at any one time and any proposed disturbance to waterways and associated fisheries resources. This description should also outline rehabilitation success criteria for the decommissioning of the pipeline at the end of operational life. Pipeline decommissioning should be informed by appropriate Australian Standard (AS 2885.3) and the Australian Pipeline Industry Association Code of Environmental Practice.

3.2 Ecologically Sustainable Development

Provide a comparative analysis of how the Proposal conforms to the objectives for “ecological sustainable development” (see the National Strategy for Ecologically Sustainable Development (1992) available from the Australian Government Publishing Service).

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

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

3.3 Location

The regional and local context of the Proposal must be described and illustrated on maps at suitable scales. Real property descriptions of the Proposal site must be provided. Maps should show the precise location of the Proposal area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the Proposal area is or will be subject;
- configurations and boundaries of land resumptions;
- the location and boundaries of the Proposal footprint; and

- the location of any proposed buffers surrounding the working areas (for construction) and around the expected full supply level (FSL) of the storage.

These features should be overlain on a rectified air photo enlargement to illustrate components of the Proposal in relation to the natural and built features of the area.

Describe the method by which ownership, control or owners' consent is to be acquired for each real property description (tenure).

3.4 Construction

The extent and nature of the Proposal's construction phase must be described (as well as any works required off-site enabling construction to commence, e.g. road upgrades), including a map at reasonable scale that shows the footprint of the dam and construction works. The description must include the type and methods of construction, the construction equipment to be used and the items to be transported onto the construction site including the quarry sites from which any gravel/rock is extracted.

Any staging of the Proposal must be described and illustrated showing site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed in the construction phase must also be provided with a brief description of where those people may be accommodated and/or how they will be transported to the site.

Provide a summary of the results of studies and surveys undertaken to identify the natural resources required to implement the Proposal. The location, volume, tonnage and quality of natural resources required must be described (e.g. land, water, forests, energy, etc.).

3.4.1 Dam

Provide a description of construction activities relating to the Proposal including:

- site access;
  - upgrading of roads, railways and other infrastructure;
  - clearing; and
  - establishment requirements for construction facilities;
- construction requirements including source and extraction of construction materials;
  - details of the method of construction of the dam walls and volumes of material required;
  - any staging of construction activities;
  - construction, realignment and/or upgrading of roads;
  - works needed within the impoundment including tree clearing (by manual methods and by inundation), blasting, excavation, dredging and transport infrastructure works; and
  - works downstream including erosion protection;
- type, source, quantity and method of transport of construction materials;
- general construction standards and site management including environmental and safety management;
- timetable for construction (particularly noting seasonal rainfall or flows);
- details of any potential disruption to flows in the waterway during construction and any diversion works required;
- relocation of existing infrastructure;
- construction of additional infrastructure required for operation;
- the hours of operation;
- emergency aid/medical facilities to be provided on site;
- the construction methods and containment/disposal of construction spoil;
- solid and liquid waste handling;
- machinery access/storage areas; and
- the number and type of vehicles, machinery and equipment used for excavation, construction and operation.

3.4.2 Pipeline and Associated Infrastructure

Provide a description of construction activities relating to both the urban supply pipeline and its associated infrastructure (e.g. pump stations) and the pipeline/s and infrastructure associated with delivery of water for

irrigation purposes including:

- a map showing location of any works;
- on-site plans, layouts, boundaries and elevations;
- detailed concept and staging (if any proposed) for additional pump stations facilities and locations;
- plant and machinery likely to be involved;
- supply and storage of materials – volume, composition, handling and storage during construction;
- anticipated timing, duration and progress of pipe laying;
- possible interruption of pipeline laying to other land activities, e.g. interruption to road and or rail traffic, or the relocation of existing infrastructure;
- extent that service corridors will be used during construction and maintenance;
- width of vegetation clearing required. This information must indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas and creek crossings), and must also reference where in the EIS the impacts on such vegetation have been addressed;
- depth of trenching and burial of the pipeline; bedding materials (if any) including compaction techniques on the pipeline trench and in particular adjacent to and within waterways, to achieve bank stability;
- an assessment of expected physical and chemical properties and quantities of soil/rock to be excavated;
- procedures for trench construction and pipe-laying if rock is encountered, in particular whether ripping rock or blasting may be required and the necessary procedures especially in proximity to habitation and existing infrastructure and compliance with all relevant design and construction codes;
- typical crossing techniques including restoration works that would be used at creek crossings, and road, rail, and other service corridor crossings. Detail whether the flow of water will need to be altered within and/or diverted out of any waterway during pipeline construction. Where in-stream infrastructure is in place, identify the practicality of attaching the pipeline to these structures;
- management of weed seed spread including quarantine areas and wash-down facilities and the dispersal/destruction of weed seeds and contaminated vegetative matter;
- disposal of plant-matter left after clearing vegetation;
- details of the anticipated hydrostatic testing procedures (discussion of water usage for this activity must be addressed in section 3.6);
- testing the pipeline's integrity, including cathodic protection requirements, launcher and receiving scraper station and hydrostatic testing are to be outlined;
- cleanup and restoration (rehabilitation) of areas used during construction including camp sites and storage areas; and
- disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity.

3.5 Operations

3.5.1 Dam

Provide a description of the proposed on-going management of the dam, inundation area and buffer zone including:

- arrangements for operation of the works, including:
  - flow releases, such as compensation, fishway, environmental, irrigation etc, including timing, volume, duration and downstream extent of releases;
  - operation of gates (if relevant);
  - the anticipated pattern of inundation;
  - operation of outlet works, including details of operation and administration;
  - proposals for remote operation; and
  - proposed staffing arrangements;
- how existing seasonal flows will be managed, drawing on baseline or predictive studies, at all stages of the Proposal;
- water treatment arrangements for provision for urban supply requirements, including
  - a description of treatment facilities, associated infrastructure, and treatment methods; and
  - a describe the integration of operations within the catchment;
- details of the minimum operating level and likely extraction regime, e.g. when water will be sourced and expected demands versus yield, including likely release timings;
- proposed access points associated with the increased storage;
- infrastructure for recreational purposes; and
- proposed operation of the fishway and/or other fish transfer mechanisms.

This section must describe the proposed system of allocation of water from the Proposal and any proposed high priority allocations to specific urban, rural or industrial users.

3.5.2 Pipeline and Associated Infrastructure

Detail the urban and irrigation pipeline and associated infrastructure operation and maintenance requirements including inspection and surveillance activities and frequency, the impact on waterways as a result of operation and maintenance activities and safety procedures.

Provide details on the operational requirements of the pump stations and balance tanks, including:

- management arrangements, including the administration and control of the facility;
- chemicals and hazardous goods to be utilised;
- security, public safety and emergency procedures, including ventilation;
- power back-up in emergency and potential impact on local supplies in the area; and
- appropriate sound-proofing.

The location and design of any new water distribution infrastructure (e.g. pump stations, canals, pipelines etc.) must be described, as well as the expected use of any such existing infrastructure. The capacity of any existing water infrastructure to accept additional loadings resulting from any new or increased allocations of water must also be described.

3.6 Infrastructure Requirements

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

3.6.1 Transport

Provide a brief overview of transport requirements for the Proposal. Full details of transport volumes, modes and routes must be provided in accordance with Section 4.9 Transport and Access Arrangements.

3.6.2 Water Supply and Storage

The water resource requirements of the Proposal must be critically determined including the quality and quantity of all water supplied to the site. In particular, the proposed and optional sources of water supply must be described (e.g. bores, any surface storages such as dams and weirs, municipal water supply pipelines).

Estimated rates of supply from each source (average and maximum rates) must be given. Any proposed water conservation and management measures must be described. Factors such as potential on-farm efficiencies, water conservation and re-use strategies must be evaluated.

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

3.6.3 Stormwater Drainage

A description must be provided of the proposed stormwater drainage system for all components of the Proposal and the proposed disposal arrangements, including any off-site services.

3.6.4 Sewerage

This section must describe, in general terms, the sewerage infrastructure required by the Proposal. If it is intended that industrial effluent or relatively large amounts of domestic effluent are to be discharged into an existing sewerage system, an assessment of the capacity of the existing system to accept the effluent must be provided in section 4.5.

3.6.5 Water Distribution and Treatment Systems

The section must describe, in general terms, the expected scope of the potential water distribution and treatment systems to be used to distribute water from the proposed Proposal, to provide an understanding of generally how water from the Proposal will be distributed. Identify which of these systems are to be assessed under separate processes, and not form part of this EIS process.

3.6.6 Energy

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

3.6.7 Telecommunications

The EIS must describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

3.6.8 Workforce and Accommodation

Describe the number of personnel to be employed, the skills' base of the required workforce and the likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each aspect of the Proposal. The estimated number of people to be employed during construction and operations and arrangements for their transport to and from the project areas, including the proposed use of regional or charter air services should be provided.

Estimates should be provided according to occupational groupings and variations in the workforce numbers over the duration of the Proposal (e.g. histogram). The information should show anticipated peaks in worker numbers during the construction period.

Provide an outline of recruitment schedules and policies for recruitment of workers (addressing recruitment of local and non-local workers).

Prove a description of an accommodation strategy for the construction workforce that addresses the estimated housing needs of both single and accompanied construction workers. This should include details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site. Maps should be included as necessary to illustrate the site and should include the location of any proposed construction workers' accommodation on-site or in the vicinity of the Proposal. The strategy should also include details of the operational workforce and how such accommodation is proposed to be supplied.

If camp sites are to be used to accommodate the workforce, details on the number, location (shown on a map), proximity to the construction site and typical facilities for these sites should be provided. Information should include data relating to facilities for:

- food preparation and storage;
- ablution facilities;
- vector and vermin control;
- fire safety;
- dust and noise control in relation to proximity of camp site to the construction area; and

- the service personnel required to maintain the camp and the supply of services to each construction camp.

Local government approvals required for establishment and operation of such camps should be outlined.

3.6.9 Other Infrastructure

Provide a description of any other developments directly related to the Proposal not described in other sections, such as fuel storage areas, equipment hardstand and maintenance areas and technical workshops and laboratories.

3.6.10 Rehabilitation

This section must describe the options, strategies and methods for progressive and final rehabilitation of the environment disturbed by the Proposal. The strategic approach to progressive and final rehabilitation of the construction site must be described. A preferred rehabilitation strategy must be developed with a view to minimising the amount of land disturbed at any one time. The final topography of any excavations, waste areas and temporary dam sites must be shown on maps at a suitable scale.

Any proposals to divert waterways during construction, and, if applicable, proposals for the reinstatement of the waterways after construction has ceased, must be provided. A description of topsoil management must consider suitability, erosion and dispersion potential, transport, storage and replacement of topsoil to disturbed areas. Details must be provided of a weed management program for rehabilitated and disturbed areas covering a minimum period of two years following completion of construction.

3.6.11 Decommissioning

The practicality of decommissioning and potential decommissioning options of the dam and associated infrastructure must be addressed at a strategic level to provide an understanding of potential impacts and possible mitigation measures associated with this possible future phase.

4 Environmental Values and Management of Impacts

The functions of this section are:

- To describe the existing environmental values of the area that may be affected by the Proposal. Environmental values are defined in section 9 of the EP Act, environmental protection policies and other documents such as the Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 guidelines and South East Queensland Regional Water Quality Management Strategy. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines. Environmental values must be described by reference to background information and studies, which must be included as appendices to the EIS.
- To describe the potential adverse and beneficial impacts of the Proposal on the identified environmental values.
- To describe any cumulative impacts on environmental values caused by the Proposal, either in isolation or by combination with other known existing or planned sources of contamination.
- To present environmental protection objectives and the standards and measurable indicators to be achieved.
- To examine viable alternative strategies for managing impacts. These alternatives must be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives must be discussed. This section must detail the environmental protection measures incorporated in the planning, construction, operations, rehabilitation and associated works for the Proposal. Measures must prevent, or where prevention is not possible, minimise environmental harm and maximise socio-economic and environmental benefits of the Proposal. Preferred measures must be identified and described in more detail than other alternatives.

Environmental protection objectives may be derived from legislative and planning requirements which apply to the Proposal, including Australian government strategies, State planning policies, local authority strategic plans, environmental protection policies under the EP Act, and any catchment management plans prepared by local water boards or land care groups. Special attention must be given to those mitigation strategies designed to protect the values of any sensitive areas and any identified ecosystems of high conservation value within the area of possible Proposal impact.

This section must address all elements of the environment, (such as land, water, air, waste, noise, nature conservation, cultural heritage, social and community, health and safety, economy, hazards and risk) in a way that is comprehensive and clear. To achieve this, the following issues must be considered for each environmental value relevant to the Proposal:

- Environmental values affected: describe the existing environmental values of the area to be affected, including values and areas that may be affected by any cumulative impacts (refer to any background studies in appendices - note such studies may be required over several seasons). It must be explained how the environmental values were derived (e.g. by citing published documents or by following a recognised procedure to derive the values).
- Impact on environmental values: describe quantitatively the likely impact of the Proposal on the identified environmental values of the area. The cumulative impacts of the Proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts.
- Cumulative impacts on the environmental values of land, air and water and cumulative impacts on public health and the health of terrestrial and aquatic ecosystems must be discussed in the relevant sections. This assessment may include air and water sheds affected by the Proposal and other proposals competing for use of the local air and water sheds.
- Where impacts from the Proposal will not be felt in isolation to other sources of impact, it is recommended that the proponent develop consultative arrangements with other industries in the Proposal's area to undertake cooperative monitoring and/or management of environmental parameters. Such arrangements must be described in the EIS.
- Environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objective as well as the numerical standard that defines the achievement of the objective (this standard must be auditable). The measurable indicators and standards

can be determined from legislation, support policies and government policies as well as the expected performance of control strategies. Objectives for progressive and final rehabilitation and management of contaminated land must be included.
- Control strategies to achieve the objectives: describe the control principals, proposed actions and technologies to be implemented that are likely to achieve the environmental protection objectives. Details are required to show that the expected performance is achievable and realistic.
- Monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals.
- Auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed. Include scope, methods and frequency of auditing proposed.
- Management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented e.g. continuous improvement framework including details of corrective action options, reporting (including any public reporting), monitoring, staff training, management responsibility pathway, and any environmental management systems and how they are relevant to each element of the environment.
- Information quality: information given under each element must also state the sources of the information, how recent the information is, how any background studies were undertaken (e.g. intensity of field work sampling), how the reliability of the information was tested, and what uncertainties (if any) are in the information.

It is recommended that the final ToR and the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS must be used to develop the EM Plan for the Proposal (see section 5).

4.1 Land

This section describes the existing environment values for all land areas that may be affected by the Proposal, including areas affected by the pipeline route and any new permanent or temporary facilities constructed for the pipeline and associated dam and pipeline infrastructure.

4.1.1 Topography and Geomorphology

4.1.1.1 Description of Environmental Values

Maps must be provided locating the Proposal in both regional and local contexts. The topography of the proposed dam site must be detailed with contours at suitable increments (at one metre contours for the dam construction site), shown with respect to Australian Height Datum (AHD) and in relation to the FSL and buffer zone for the storage.

Significant features of the locality must be included on maps and be accompanied by appropriate commentary describing the significant topographical features. Such features would include any locations subsequently referred to in the EIS (e.g. the nearest noise sensitive locations) that are not included on other maps in section 4.1.

The topography surrounding the Proposal must be detailed at 1m increments with levels shown with respect to AHD features for watercourse crossings.

4.1.1.2 Potential Impacts and Mitigation Measures

The Proposal should be discussed in the context of major topographic features and any measures taken to avoid or minimise impact to such (if required).

The potential for the Proposal to adversely impact on the stability of landforms within the impoundment area, infrastructure areas and adjacent lands must be addressed in detail. This must include the stability and potential for erosion of periodically inundated land below FSL and the buffer zone and adjacent catchment areas. The stability and potential for erosion of the watercourse and associated riparian zone downstream of the Proposal must be addressed, including changes to sediment delivery, transport and deposition.

The proposed re-contouring and landscaping objectives of the Proposal should be described.

4.1.2 Geology and Soils

4.1.2.1 Description of Environmental Values

The EIS must provide a description, map at a suitable scale and a series of cross-sections of the geology of the Proposal dam site 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 must 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, the EIS must address the potential for significant finds.

Soil profiles must be mapped at a suitable scale with particular reference to the physical and chemical properties of the soils which would influence erosion potential, dam and storm water run-off quality, rehabilitation and agricultural productivity of the land, including lands within the buffer zone and below the FSL of the dam that may be periodically exposed. Soil information must also be provided on soil stability and suitability for construction of Proposal facilities an appraisal of the depth and quality of useable soil must be undertaken.

Soils must be described according to the Australian soil and land survey field handbook (McDonald et al, 1990) and Australian soil classification (Isbell, 1996). Information must be presented according to the standards required in the Planning Guidelines: Identification of Good Quality Agricultural Land (GQAL) (DPI, DHLGP, 1993), and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land. The area of GQAL that will be inundated must be clearly indicated, and an assessment of the potential for land use conflict with GQAL is required with investigations following the procedures set out in the planning guidelines referred to above.

Soil descriptions must include horizon differentiation and depths, field texture, colour, mottles, drainage, permeability and water holding capacity characteristics, soil structure, erosion hazard rating, pH and electrical conductivity. The location of each borehole must be accurately presented, and boreholes must equitably represent the different soil types present. Any highly erodible soils, sodic soils, saline sites and sites which are particularly susceptible to becoming saline (including downstream of the Proposal, where applicable) must be especially identified. Information must also be provided on soil stability and suitability to construction of all facilities and infrastructure. The investigation area must include all areas potentially affected by the Proposal including the buffer zone and associated infrastructure corridors.

4.1.2.2 Potential Impacts and Mitigation Measures

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

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

The report must include 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 dam site, including buildings;
- along the pipeline route;
- access roads or other transport corridors;
- any waste dumps; and
- dams, banks and creek crossings.

Methods proposed to prevent or control erosion must be specified and must be developed with regard to

preventing soil loss in order to maintain land capability/suitability and preventing significant degradation of local waterways by suspended solids.

The options for mitigation and the effectiveness of mitigation measures should be discussed with particular reference to sediment, acidity, salinity, sodicity and other emissions of a hazardous or toxic nature to the river systems.

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

4.1.3 Land Contamination

4.1.3.1 Description of Environmental Values

Areas of potential contamination within the inundation area and buffer zones, including but not limited to, Notifiable Activities as listed in Schedule 2 of the EP Act, historic mine sites etc, should be evaluated. Should potentially contaminated sites be identified, a preliminary site investigation must be conducted, on the basis that the scope of any preliminary site investigation should be consistent with the assessed level of risk at each site. The results of any preliminary site investigations undertaken should be summarised in the EIS and provided in detail in an appendix.

The following information should be discussed in the EIS:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the EP Act;
- identification of any potentially contaminated sites not on the registers which may need remediation; and
- a description of the nature and extent of contamination at each site and a remediation plan and validation sampling.

4.1.3.2 Potential Impacts and Mitigation Measures

This section should provide details of any potential impacts from land contamination and proposed mitigation measures, including:

- a description of the nature and extent of existing or potential contamination at each site and a strategy for further investigation, remediation and validation sampling, if required.
- details of any potential risks to occupational or human health, as a result of any residual contamination levels, to any of the proposed uses of the dam, including recreational, agricultural or human consumption, including potential impacts on water quality.
- the means of preventing land contamination (within the meaning of the EP Act) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should be stated concerning the classification (in terms of the Environmental Management Register and the Contaminated Land Register) of land contamination on the land after completion of construction of the Project.

The EIS must describe the possible contamination of land from aspects of the Proposal including waste, reject product, acid generation from exposed sulfidic material and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the EP Act) must be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land must be outlined. Intentions must be stated concerning the classification (in terms of the CLR) of land contamination on the land, processing plant site and product storage areas after Proposal completion.

The EIS must address the management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from Proposal activities.

4.1.4 Land Use and Infrastructure

4.1.4.1 Description of Environmental Values

The EIS must provide a description of current land tenures and land uses, including native title issues, in the Proposal area, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims must be shown.

Maps at suitable scales showing existing land uses and tenures, and the Proposal location, must be provided for the entire Proposal area and surrounding land that could be affected by the development. The maps must identify areas of conservation value in any locality that may be impacted by the Proposal. The location of all existing dwellings, significant structures and the zoning of all affected lands according to the existing (and draft where applicable) local government town planning schemes and strategic plans must be identified and mapped.

Describe the land use suitability of the affected area in terms of the physical and economic attributes. The assessment must set out soil and landform subclasses assigned to soil mapping units in order to derive land suitability classes.

Detail the nature of rural enterprises and the agricultural value of lands affected by the Proposal. Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses, e.g. for grazing of native and improved pastures and horticulture.

The location and owner/custodians of all infrastructure tenures including reserves, roads and road reserves, railways and rail reserves and stock routes, covering the affected land must be shown on maps of a suitable scale. Indicate locations of gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this infrastructure.

4.1.4.2 Potential Impacts and Mitigation Measures

The Proposal must be discussed in the context of major topographic features (including influences on stream configuration) and any measures taken to avoid or minimise impact to such.

The potential for the construction and operation of the Proposal to change existing and potential land uses of the Proposal site and adjacent and downstream areas must be detailed. Post operations land use options must be detailed including suitability of the area within the FSL and adjacent area (including buffer zone) to be used for agriculture or nature conservation. The factors favouring or limiting the establishment of those options must be given in the context of land use suitability prior to the Proposal and minimising potential liabilities for long-term management.

Provide a description of the following:

- management of the immediate environs of the Proposal including the buffer zones and/or restrictions on livestock access;
- individual properties and businesses affected by the Proposal – area and type of land inundated, property facilities affected, access changes to and within the property;
- the land acquisition strategy resulting from investigations into the land acquisition for the inundated areas;
- possible effect on town planning objectives and controls, including council zoning and strategic plans;
- opportunities for redevelopment around the inundation zone for a range of residential, recreational and other development types;
- constraints to potential developments and possibilities of rezoning upstream of the inundation zone;
- possible impacts on, or sterilisation of, identified mineral or energy resources and extractive industry deposits, the amount of sterilisation (if any) of the deposits resulting from the construction and/or operation of the Proposal;
- identification of any millable timber or quarry resources within the Proposal area and an assessment of the commercial value of these resources to satisfy the requirements of the Department of Natural Resources and Water;
- discussion of potential issues involved in proximity and/or co-location of other infrastructure services, and/or the separation requirements of the dam, including electric power transmission lines and electrified rail lines, or where construction and maintenance machinery is used in the vicinity of other infrastructure corridors;

- identification of any land units requiring specific management measures;
- description of possible impacts on surrounding land uses and human activities, including impacts to GQAL and forestry land (addressing loss of access to land, fragmentation of sites, increase of fire risk and loss of productive land for those purposes) as well as residential and industrial uses, and strategies for minimisation; and
- proposed measures to minimise impact on GQAL.

Provide an assessment of:

- the suitability of the pipeline route for co-location of other infrastructure services;
- identification of how easement widths and vegetation clearance in sensitive environmental areas have been minimised;
- the suitability of any pipeline alignment and the cost of alternatives in terms of corridors preserved by the Department of Main Roads for future transport needs;
- the potential issues involved in proximity of the water pipeline to electric transmission lines and electrified rail lines, both at crossing points, where lines run parallel, and where construction and maintenance machinery is used in the vicinity of other infrastructure corridors;
- discussion of the Proposal construction impacts on continued access to all parts of the properties fringing the Proposal, the effect on property management for stock, cropping and weed control, and the likely impacts on existing road networks (both farm and gazetted roads), including an assessment of any adverse/beneficial impacts on present or potential land use at FSL;
- discussion of the potential impact on upstream and downstream land uses (including conservation estates) from additional water made available as a consequence of the Proposal; and
- an assessment of the potential impacts of the Proposal on existing and potential irrigated agriculture and/or industrial developments and the possible conflict between these and other existing land uses.

This section must describe the connection between water quality needs in the proposed storage and post development land use options including suitability of agricultural practices in the catchment of the impoundment. Restrictions that may be imposed on current land use practices must be specifically indicated and the method/s for regulating these must be stated.

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

4.1.5 Landscape Character and Visual Amenity

4.1.5.1 Description of Environmental Values

Describe the existing character of the landscape that will be affected by the Proposal in general terms. This should ‘set the scene’ for the description of particular scenic values by providing a general impression of the landscape that would be obtained while travelling through and around it. Provide details on any changes that have already been made to the natural landscape since European settlement.

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

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

- the value of existing vegetation as a visual screen.

4.1.5.2 Potential Impacts and Mitigation Measures

This section must analyse and discuss the visual impact of the Proposal on particular panoramas and outlooks. It must be written in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from road, cycle and walkways, from the air and other known vantage points day and night, during all stages of the Proposal as it relates to the surrounding landscape. The assessment is to address the visual impacts of the Proposal structures and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations. Special consideration is to be given to public roads, public thoroughfares, and places of residence or work, which are within the line-of-sight of the Proposal.

A strategy must be developed with a view to minimising the amount of land disturbed at any one time. The methods to be used for the Proposal, including re-contouring, topsoil handling and revegetation, must be described. Consideration must be given to the use of threatened plant species during any landscaping and revegetation.

Where the dam, roads and other infrastructure are to be constructed, proposals for the management of these structures after the completion of the Proposal must be given. A contour map of the area must be provided (if relevant). Also, the final drainage and seepage control systems and any long-term monitoring plans must be described.

Describe the potential impacts of the Proposal on the landscape character of the site and the surrounding area. Particular mention must be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing. Detail must be provided of all management options to be implemented and how these will mitigate or avoid the identified impacts on the landscape and visual amenity of the affected areas.

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

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

4.2 Climate

This section must 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 region of the Proposal. An assessment of historic rainfall patterns including geographic distribution within the catchment must also be provided.

Extremes of climate (droughts, floods, cyclones, etc) must 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, must also be addressed. The relative frequency, magnitude and risk of these events must be considered.

The potential impacts due to climatic factors must be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion must be addressed in section 4.1. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management and tailings dams) must be addressed in section 4.3 with regard to contamination of waterways and in section 4.4 with regard to the design of waste containment systems. The impacts of wind, rain, humidity and temperature inversions on air quality must be addressed in section 4.5.

4.3 Water Resources

4.3.1 Surface Waterways

4.3.1.1 Description of Environmental Values

This section describes the existing environment for water resources that may be affected by the Proposal in the context of environmental values as defined in such documents as the EP Act, Environmental Protection (Water) Policy 1997 (EPP (Water)), ANZECC 2000 and the South East Queensland Water Quality Management Strategy. The definition of waters in the EPP (Water) includes the bed and banks of waters, so this section must address impacts on benthic sediments as well as the water column.

Where a licence or permit will be required under the *Water Act 2000* to take or interfere with the flow of water, this section of the EIS must provide sufficient information for a decision to be made on the application. Similarly, waterway barrier works may need approval under the *Fisheries Act 1994*, and if so must be addressed in the EIS.

A description must be given of the surface waterways and their quality and quantity in the area affected by the Proposal with an outline of the significance of these waters to the river catchment system in which they occur. The description must include historical and existing quantitative hydrological data and details of existing regulatory structures and other barriers up and downstream of the Proposal site. Details provided must include a description of existing surface drainage patterns, and flows in major streams and wetlands. Also provide details of the likelihood of flooding, history of flooding including extent, levels and frequency, and a description of present and potential water uses downstream of the areas affected by the Proposal. Flood studies must include a range of annual exceedence probabilities for affected waterways, where data permits.

The EIS must provide a description, with photographic evidence, of the geomorphic condition of any watercourses likely to be affected by disturbance or stream diversion. The results of this description must form the basis for the planning and subsequent monitoring of rehabilitation of the watercourses during or after the operation of the Proposal. Include details of the stream bed morphology at the downstream foot of the dam to assess the effect on the passage of fish.

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the Proposal. The basis for this assessment must be a monitoring program, with sampling stations located upstream and downstream of the Proposal. A detailed description of the monitoring program is required, including locations of sampling points, sampling regime, and other elements of the sampling/monitoring design. Complementary stream-flow data may also be obtained from historical records (if available) to aid in interpretation.

The water quality must be described, including seasonal variations or variations with flow where applicable. A relevant range of physical, chemical and biological parameters must be measured to gauge the environmental harm on any affected creek or wetland system.

Describe the watercourses to be crossed by the pipeline showing planned crossing locations on a map and any other waterways or water features, including drainage channels, gullies, flood-prone or low lying land on or adjacent to the Proposal site. Provide a discussion of alternative crossing locations in environmentally sensitive areas.

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

- values identified in the EPP (Water);
- sustainability, including both quality and quantity;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form;
- hydrology of floodplains, waterways and groundwater;
- the current operation of any water storage and distribution system on the Severn River, including yield, operating strategy, supply reliability, allocation and use of water supplies;
- any water resource plans, resource operation plan,land and water management plans relevant to the affected catchment;

- the historical (without current storages in the Severn River catchment) and current flow characteristics including seasonal flow patterns, flow volumes and duration both upstream and downstream of the proposed dam site;
- the changes in the parameters from pre-regulation (if applicable) to current and proposed post-Proposal conditions, and the corresponding changes that may be anticipated in:
    - in-stream and connected wetland morphology and ecology; and
    - sediment/nutrient/energy processes in the catchment;
    - in-stream and connected wetland morphology;
    - in-stream pools/runs;
    - in-stream riffles/rapids;
    - off-stream perennial pools (billabongs, ox-bow lakes etc); and
    - morphology, physical integrity (including stream bank erosion) and fluvial processes of the riparian zone within the potential impact area of the Proposal.
- siltation patterns, including seasonal/flow related variation;
- details of current or proposed flow management schemes for the waterway;
- details of the length of stream already impounded and the additional effect of the Proposal; and
- potential sources of water for construction.

Discuss the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of the water impoundment structures containing walls, the quality of water contained, and flows and quality of water discharged.

Provide details on the following in regard to the construction phase of the Proposal:

- effects of drainage works, placement of fill, clearing or any other alterations to existing topography and landform on the hydrology of the site including any alteration to drainage patterns and the water table and secondary influence on flooding. If levee banks or stream diversionary constructions are proposed, the effects on neighbouring landholders must be considered, and any works requiring permits or licensing in accordance with the Water Act 2000 identified;
- timing of the construction works relative to likely periods of flooding and proposals to minimise the risk of adversely impacting downstream water quality; and
- measures to ensure weeds (including seeds) are not released into the water environment from machinery traversing creek systems or riparian areas.

Provide an assessment of the existing environment for water quality that may be affected by the Proposal in the context of environmental values as defined in such documents as the EP Act, EPP (Water) and ANZECC 2000. This assessment should emphasise the relationship between surface water flows and downstream water quality and ecosystem function and must consider the:

- existing surface and ground water quality in terms of physical, chemical and biological characteristics at the Proposal site and upstream and downstream of the site, including consideration of seasonal or flow variations where applicable;
- the water quality (historical, current) of the Severn River including areas and tributaries upstream and downstream of the proposed dam site, in comparison with water quality in adjacent catchments must be made (including records of blue-green algal blooms, and identification of long term, seasonal or other trends);
- any seasonal variation in water quality parameters (including temperature, dissolved oxygen, chlorophyll, turbidity, total suspended solids, pH, electrical conductivity, metals and nutrient levels, as well as phytoplankton including blue-green algae).
- a relevant range of physical, chemical and biological parameters must be included to gauge the impacts on the downstream environment. The water quality objectives for the river must be summarised, with reference to the Queensland Water Quality Guidelines 2006, the EPP Water and the latest ANZECC Guidelines where appropriate.

The basis for this assessment must contain a literature review supplemented by a monitoring program, with sampling stations located upstream and downstream of the Proposal site. Complementary stream-flow data must also be obtained from historical records (if available) to aid in interpretation.

4.3.1.2 Potential Impacts and Mitigation Measures

This section is to assess potential impacts on water resource environmental values identified in the previous

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

The EIS must describe the possible environmental harm caused by the Proposal to environmental values for water as expressed in the EPP (Water).

Water management controls must be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby surface and groundwater must be discussed, along with the Proposal for the diversion of affected creeks during mining, and the stabilisation of those works. Monitoring programs must be described which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the Proposal.

Key water management strategy objectives include:

- protection of the integrity of the aquatic environment;
- protection of important local aquifers and protection of their waters;
- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota, in-stream structure and processes and the littoral zone); and
- minimisation of impacts on flooding levels and frequencies both upstream and downstream of the Proposal.

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

The potential environmental harm to the flow and the quality of surface waters from all phases of the Proposal must be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, wetland, littoral zone, and any in-stream biological uses and water delivery. The impacts of surface water flow on existing infrastructure must be considered. Refer to the EPP (Water) and *Water Act 2000*, Water Resources (Borders River) Plan 2003. Particular emphasis must be given to likely impacts on the riparian and aquatic values of Sundown National Park in the context of environmental flows, water quality, aquatic ecology (community ecological and habitat) and aquatic species that are endangered, vulnerable or rare, this assessment must address how changes to the flows in the Severn River could impact on triggers for spawning or breeding.

The hydrological impacts of the Proposal must be assessed, particularly with regard to stream diversions, scouring and erosion, and changes to low flow and flooding levels and frequencies both upstream and downstream of the Proposal. When flooding levels will be affected, modelling of afflux must be provided and illustrated with maps. Assessment of impacts on the flow and the quality of surface waters and effects on ecosystems must include an assessment of the:

- likely effects on riparian habitats and off stream wetlands as a result of any temporary diversion of existing water courses;
- impacts of the Proposal on flow regime indicators and stipulate the assumptions made (e.g. release patterns, release capacity, consumptive uses) in reaching this assessment;
- flow regime for downstream environmental flow requirements for ecological health. Reference should be made to the Environmental Flow Objectives (EFO) in the Water Resources (Border Rivers) Plan 2003 and how these objectives are affected by the Proposal. The likelihood of not meeting the EFOs should be discussed and mitigation measures provided to ensure adequate environmental flows are maintained during the life of the dam;
- effect of environmental flow requirements on dam reliability and water availability for consumptive use;
- changes in the reliability of supply to current water entitlement holders downstream and the operation of existing water extraction;
- changes in flow patterns including changes in frequency, volumes and duration and changes in flows reaching estuarine waters, when compared at a meaningful scale with pre-regulation;
- current and predicted flows in the system;
- changes in flood regimes, including frequency of floodplain/wetland inundation and duration of inundation;

- evaluation of the impacts of potential environmental flow requirements and water for fishway operational requirements on the yield of the proposed storage and its viability;
- The hydrological impacts of the Proposal should be assessed, particularly with regard to the downstream effect on the confluence of the Severn River with Tenterfield Creek;
- proposals for the reinstatement of creeks, if the diversion of creeks is likely during construction or operations; and
- implications of any mitigating strategies on the engineering of the Proposal (e.g. the type of off-take required and outlet works as determined by environmental flow needs) must be reported.

Quality characteristics discussed must be those appropriate to the downstream and upstream water uses that may be affected. Chemical and physical properties of any waste water at the point of entering natural surface waters must be discussed along with potential impacts to downstream flora and fauna.

Provide an assessment of the potential to contaminate surface water resources and measures to prevent, mitigate and remediate. This assessment must include:

- surface water quality, quantity, drainage patterns and sediment movements;
- the beneficial use of surface water;
- monitoring programs to assess the effectiveness of management strategies for protecting water quality during the construction, operation and, if applicable, decommissioning of any temporary structures;
- quality of the water leaving the proposed dam construction site and infrastructure construction sites during construction and operation;
- quality of water released from the impoundment under proposed operating conditions and seasonal variation (including pollutant concentrations and relevant parameters such as pH, dissolved oxygen, turbidity, metals and suspended solids);
- quality of water within the impoundment and downstream under proposed operating conditions and seasonal variation (including potential for blue-green algae blooms) and implications for drinking water standards;
- potential impact of water quality changes on flora and fauna in and around the impoundment and downstream;
- the effects of depth and holding time of water within the storage, and the effects on downstream water quality under varying scenarios of flow release;
- potential for stratification and 'turn-over' of the storage and implications for water quality management for both water supply and aquatic fauna;
- the likelihood of infestation by water weeds which may have the potential to affect the water quality; and
- possible sources of water pollution or other changes in water quality including soil erosion, sedimentation, soil leachates, interaction with groundwater, drilling fluids, accidental spills, waste and sewage disposal and likely chemical composition of any leachate from introduced fill on the site.

In relation to water supply and usage, and wastewater disposal, the EIS must discuss anticipated flows of water to and from the Proposal area. The EIS must investigate the effects of predictable climatic extremes (storm events, floods and droughts) on: the capacity of the dams to contain flood waters, the structural integrity of the containing walls; and the quality of water contained, and flows and quality of water discharged. The design of all water storage facilities must follow the technical guidelines on site water management.

The need or otherwise for licensing of any dams or creek diversions, under the *Water Act 2000* must be discussed. Water allocation and water sources must be established in consultation with Department of Natural Resources and Water.

The Queensland Water Quality Guidelines 2006, ANZECC 2000 National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters and the EPP (Water) must be used as a reference for evaluating the effects of various levels of contamination.

Options for mitigation and the effectiveness of mitigation measures must be discussed with particular reference to sediment, acidity, salinity and other releases of a hazardous or toxic nature to human health, flora or fauna.

4.3.2 Groundwater

4.3.2.1 Description of Environmental Values

The EIS must review the quality, quantity and significance of groundwater in the Proposal area, together with groundwater use in neighbouring areas and describe the existing environment for hydrogeology resources that may be affected by the Proposal in the context of environmental values as defined in such documents as the EP Act, EPP (Water) and ANZECC 2000.

The possible significance of the Proposal to groundwater depletion or recharge, or impact on any existing or potential saline water intrusion problem of existing aquifers, must also be addressed. The depth to groundwater, quantity and water quality and users of the groundwater in the vicinity of the Proposal must be detailed. The review must include a survey of existing groundwater supply facilities (bores, wells, or excavations) within the groundwater area impacted by the Proposal. This review is to include details on the:

- location;
- pumping parameters;
- draw down and recharge at normal pumping rates;
- seasonal variations (if records exist) of groundwater levels;
- basic water quality of the aquifer;
- proximity of the groundwater facilities to the Proposal and value of these facilities for rural, industrial and/or domestic use; and
- a description of the current use of groundwater within the impacted areas.

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

This section must include reference to:

- Nature of the aquifer/s
    - geology/stratigraphy - such as alluvium, volcanic, metamorphic;
    - aquifer type - such as confined, unconfined; and
    - depth to and thickness of the aquifers.
- Hydrology of the aquifer/s
    - depth to water level and seasonal changes in levels;
    - groundwater flow directions (defined from water level contours);
    - interaction with surface water;
    - possible sources of recharge; and
    - vulnerability to pollution.

This section must include reference to:

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

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

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

4.3.2.2 Potential Impacts and Mitigation Measures

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

The impact assessment must 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 must be described.

Provide an assessment of the potential groundwater impacts in the environs of the Proposal including any alteration to drainage patterns or water table disruption. This assessment must include:

- activities that could affect the availability and quality of groundwater resources;
- impacts of vegetation clearing, sedimentation and salinity to local groundwater resources;
- impacts of the Proposal on the local ground water regime caused by the altered porosity and permeability of any land disturbance
- identification of groundwater resources proposed to be used by the Proposal, including a description of the quality, quantity, usage rate and required location of those resources;
- information on the characteristics of target aquifers, including seasonal variability, capacity to provide the required volumes of water at the expected usage rate, recharge potential and profile of existing extraction;
- assessment of the impacts of the required extraction of groundwater resources and proposed mitigation measures to reduce the impact of the Proposal on groundwater quality including the potential for interconnection between the target and underlying aquifers;
- the overall impacts of the Proposal (and any additional surface irrigation water) on local groundwater resources;
- where groundwater is determined to be at risk, options for the prevention or mitigation of such risk;
- decommissioning of temporary groundwater bores; and
- the need or otherwise for licensing of any groundwater bores under the *Water Act 2000*.

An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination must be provided. This assessment must include:

- groundwater quality, quantity and drainage patterns ;
- the beneficial use of groundwater;
- monitoring programs to assess the effectiveness of management strategies for protecting water quality during the construction, operation and, if applicable, decommissioning;
- potential impact of water quality changes on flora and fauna (including stygafauna communities) in and around the impoundment and downstream;
- the effects of depth and holding time of water within the storage;
- possible sources of water pollution or other changes in water quality including soil leachates, interaction with surface water, drilling fluids, accidental spills, waste and sewage disposal and likely chemical composition of any leachate from introduced fill on the site.

4.4 Air

4.4.1 Description of Environmental Values

This section describes the existing air environment that may be affected by the Proposal in the context of environmental values as defined by the EP Act and Environmental Protection (Air) Policy 1997 (EPP (Air)).

Ambient air quality conditions in terms of particulate matter must be described for any sensitive sites (see EPP (Air)) in proximity to the dam and associated infrastructure development areas, including any baseline monitoring results.

4.4.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values for air, 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 objectives for air emissions must be stated in respect of relevant standards (ambient and ground level concentrations), relevant emission guidelines, and any relevant legislation, and the emissions modelled using a recognised atmospheric dispersion model.

Describe the quality and quantity of air emissions within the Proposal area expected during construction and operational activities. Impacts arising from dust generation from construction activities (including extractive

industries associated with provision of construction material); especially in areas where construction activities are adjacent to existing road networks or pass in close proximity to residences must be specifically described. This must also include environmental impact on terrestrial and aquatic animals and avifauna.

Where appropriate, the predicted average ground level concentrations in nearby areas must be provided. These predictions must be made for both normal and the worst case meteorological conditions must be identified. Ground level predictions must be made at any residential, industrial and agricultural developments believed to be sensitive to the effects of predicted particulate emissions. The techniques used to obtain the predictions must be referenced, and key assumptions and data sets explained. The assessment of the Proposal's impact on air quality must include at least the following matters:

- predicted changes to existing air quality from vehicle emissions and dust generation along haulage routes; and
- identification of climatic patterns that could affect dust generation and movement.

4.4.2.1 Greenhouse Gas Emissions and Abatement

This section of the EIS must:

- provide an inventory of the Proposal's emissions for each relevant greenhouse gas during construction, including material transportation, with total emissions expressed in 'CO2 equivalent' terms; and
- provide details on the Proposal's loss of annual greenhouse gas absorption capacity that will result from the clearing of vegetation.

The Australian Greenhouse Office Factors and Methods Workbook (available via the internet) can be used as a reference source for emission estimates and supplemented by other sources where practicable and appropriate.

- Air quality predictions must be compared to the relevant goals in the Environmental Protection (Air) Policy 1998 goals;

Provide details of the proposed the features designed to suppress or minimise emissions, including dusts and odours and how these will mitigate measures each identified impact relating to vehicle emission, dust generation and gaseous emissions.

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

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from construction of the Proposal; and
- an assessment of how the preferred measures minimise emissions.

4.5 Waste

This section must complement other sections of part 4 of the EIS by providing technical details of waste treatment and minimisation, with proposed discharge and disposal criteria, while other sections describe how those 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 the EM Plan.

4.5.1 Character and Quantities of Waste Materials

Provide an inventory of all wastes to be generated by the Proposal during the construction and operational phases of the Proposal.

Schematic diagrams, which for the operational phase may be simplified versions of those provided in section 3.3, must be provided for each distinct stage of the Proposal (e.g. construction/site preparation, commissioning and operation) indicating the processes to be used and highlighting their associated waste streams (i.e. all waste outputs: solid, liquid and gaseous), including recycling efforts. The schematic diagrams, or an associated table, must cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described.

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, the proposals for waste avoidance, reuse, recycling, treatment and disposal must be described in the appropriate sub-section below. Information must also be provided on the variability, composition and generation rates of all waste produced at the Proposal sites.

Cleaner production waste management planning must be detailed especially as to how these concepts have been applied to preventing or minimising environmental impacts at each stage of the Proposal.

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

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 must 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;
- 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 must be described;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dumps must be given; and
- market demand for recyclable waste (where appropriate) must be addressed.

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

Cleaner production waste management planning must be detailed especially as to how these concepts have been applied to preventing or minimising environmental impacts at each stage of the Proposal.

The proposed location and suitability of any existing or proposed landfill to receive solid waste from construction and operational phases of the Proposal must be identified. Methods to be employed to prevent leachate from sites where solid waste has been deposited need to be identified and documented. These must include physical, impermeable barriers that are established as part of any waste disposal site.

Provide a description of the origin, quality and quantity of wastewater and any immiscible liquid waste originating from the Proposal. The EIS may need to consider the following:

- groundwater from excavations;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from other waste storages;
- domestic sewage treatment - disposal of liquid effluent and sludge; and
- water supply treatment plant - disposal of wastes.

4.6 Noise and Vibration

4.6.1 Description of Environmental Values

This section describes the existing environment values that may be affected by noise and vibration from the Proposal.

If the proposed activity could adversely impact on the noise environment, baseline monitoring must be undertaken at a selection of sensitive sites affected by the Proposal, including sites adjacent to the pipeline route, pump stations and balance tanks. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997 (EPP (Noise)). Long-term measured background noise levels that take into account seasonal variations are required. The locations of sensitive sites must 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 must be described.

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

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

4.6.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by noise and vibration, describes how nominated quantitative standards and indicators may be achieved for noise and vibration management, and how the achievement of the objectives will be monitored, audited and managed. The assessment of noise impacts must include matters raised in the document "The health effects of environmental noise – other than hearing loss published by the enHealth Council, 2004" (or later editions), ISNB 0 642 82304 9.

Information, including mapped noise contours from a suitable acoustic model, must be submitted based on the proposed generation of noise. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence must be quantified in terms of objectives, standards and indicators to be achieved. Particular consideration must be given to emissions of low-frequency noise; that is, noise with components below 200Hz. The assessment must also include environmental impacts on terrestrial and aquatic animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts must be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion must be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise.

Assessment must be made of the potential impacts (including compliance with relevant legislation) of blasting required for construction of the dam wall or other infrastructure construction, including potential buffers to minimise or eliminate these effects.

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

4.7 Nature Conservation

4.7.1 Sensitive Environmental Areas

4.7.1.1 Description of Environmental Values

This section describes the existing environment values for nature conservation that may be affected by the Proposal. Describe the environmental values of nature conservation for the affected area in terms of:

- integrity of ecological processes, including but not limited to habitats of rare and threatened species;
- conservation of resources;
- biological diversity, including but not limited to habitats of rare and threatened species;
- integrity of landscapes and places including, but not limited to wilderness and similar natural places; and
- aquatic and terrestrial ecosystems.

The flora and fauna communities which are rare or threatened, environmentally sensitive localities including waterways, riparian zone, and littoral zone, rainforest remnants, old growth indigenous forests, wilderness and

habitat corridors must be described. The description must include a plant species list, a vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective. The description must indicate any areas of state or regional significance identified in an approved biodiversity planning assessment (BPA) produced by the EPA (e.g. see the draft Regional Nature Conservation Strategy for SE Qld 2001-2006).

The description of environmental values must include areas within, and those linked by, the State Wildlife Corridor that would be intersected by the inundation area of the dam. The description should be to the extent necessary for the subsequent assessment of impacts on wildlife that uses the corridor.

The EIS must identify issues relevant to sensitive areas, or areas, which may have, low resilience to environmental change. The capacity of the environment to assimilate disturbances must be assessed and the Proposal proximity to any biologically sensitive areas must be described. Areas regarded as sensitive with respect to flora and fauna have one or more of the following features (and which must be identified, mapped, avoided or effects minimised):

- important habitats of species listed under the NC Act and/or EPBC Act as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems listed as 'endangered' or 'of concern' or 'not of concern' under State legislation, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the EPBC Act;
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (Japan-Australia Migratory Bird Agreement, JAMBA) and between Australia and China (China-Australia Migratory Bird Agreement, CAMBA);
- sites containing common species which represent a distributional limit and are of scientific value or which contains feeding, breeding, resting areas for populations of species of special cultural significance (e.g.. echidna, koala and platypus);
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
    - natural vegetation in good condition or other habitat in good condition (e.g. wetlands); and/or
    - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area;
- a site containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- sites of palaeontologic significance such as fossil sites;
- sites of geomorphological significance, such as lava tubes or karst;
- protected areas which have been proclaimed under the NC Act or are under consideration for proclamation; and/ or
- areas of major interest, or critical habitat declared under the NC Act or high nature conservation value areas or areas vulnerable to land degradation under the VM Act.

Reference must be made to both State and Commonwealth endangered species legislation and the proximity of the area to any World Heritage property. The VM Act and the findings of any regional vegetation management plan must also be referenced.

Key flora and fauna indicators must be identified for future ongoing monitoring. Surveys of flora and fauna need to be conducted throughout the year to reflect seasonal variation in communities and to identify migratory species. Also provide a full description of the survey methodology, including locations of sampling points, survey techniques, and sampling regime.

4.7.1.2 Potential Impacts and Mitigation Measures

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

conservation values, describes how nominated quantitative standards and indicators may be achieved for nature conservation management, and how the achievement of the objectives will be monitored, audited and managed.

The EIS must address any actions of the Proposal or likely impacts that require an authority under the NC Act, and/or would be assessable development for the purposes of the VM Act.

The discussion must cover all likely direct and indirect environmental harm due to the Proposal on flora and fauna particularly sensitive areas. Terrestrial and aquatic (freshwater) environments must also be covered. Also include human impacts and the control of any domestic animals introduced to the area. Strategies for protecting World Heritage Property and any rare or threatened species must be described, and any obligations imposed by state or Commonwealth legislation or policy or international treaty obligations must be discussed.

Strategies for collecting and preserving any significant fossils must be described.

Short-term and long-term effects must be considered with comment on whether the impacts are reversible or irreversible. Management strategies for both terrestrial and aquatic flora and fauna must be discussed in the main body of the EIS and provided in a working form in a Management Plan as part of the overall EM Plan for the Proposal. The EIS must discuss the potential for the proposal to cause fragmentation of remnant ecological communities and mitigation measures to maintain connectivity between these communities.

This section must outline the significance of clearing each species listed under the NCA according to the impact on local, regional and State populations. The practicality of relocating each species should be discussed in the context of suitable habitat and soil profile requirements, using examples of relocation success elsewhere, where available. Provide a description of any proposed relocation site/s, including the rationale for choosing the preferred site/s. The proponent's commitment to ongoing management and maintenance of any relocated populations should be outlined. For those species unable to be practically relocated, provide information about alternative mitigation measures. Consideration should be given to collecting seed and regenerating the species elsewhere within suitable ecological communities, establishing voluntary nature conservation agreements with neighbouring landowners to secure regrowth areas and ensure regeneration to remnant status, or other measures to offset the loss of species and communities. The proposed role of the proponent in managing the offset areas should be clearly stated.

Provide a full description of options for compensatory habitat measures and offsets, particularly within the region. This should describe how any compensatory habitat package or offsets developed for loss of terrestrial and aquatic flora and fauna habitats because of the Proposal relates to the species, populations or communities affected; the rationale for the selection of the compensatory habitat and/or offset package over other options; and the overall environmental difference (net loss/gain) that will occur in the extent, quality, ecological integrity and security of environmental values in the area/region due to the environmental gains from these packages compared to the loss (both short and long term and whether the impacts are reversible or irreversible) of environmental values. Reference to the code requirements of the VM Act should be made where relevant. Any departure from no net loss of ecological values must be described.

Where offset measures are proposed to address an identified impact, include:

- a description and an assessment of the expected or predicted effectiveness of the mitigation measures, including the timing of measures;
- any statutory or policy basis for the mitigation measures;
- the cost of the mitigation measures;
- the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and
- a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the impacts of the action.

[An environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action and the establishment of the proposed offsets, including any provisions for independent environmental auditing must be detailed in section 5.]

Details of all relevant impacts of the Proposal on matters of national environmental significance must be discussed in appendix A3.

4.7.2 Terrestrial Flora and Fauna

4.7.2.1 Description of Environmental Values

Vegetation mapping must provide vegetation mapping for all relevant Proposal sites including inundation areas, downstream riparian vegetation, quarry material site/s, construction site/s, pump stations, pipeline corridors, easements and adjacent areas. The terrestrial vegetation communities within these affected areas must be described at an appropriate scale (i.e. 1:10,000) with mapping produced from aerial photographs and ground truthing, showing the following:

- location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with the Regional Ecosystem Description Database [REDD] available at the EPA's website;
- location of vegetation types of conservation significance based on EPA'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 VM Act;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges);
- any plant communities of cultural, commercial or recreational significance must be identified; and
- location and abundance of any exotic or weed species.

Within each defined (standard system) vegetation community, a minimum of three sites (numbers must be discussed with the EPA) must be surveyed for plant species in both summer and winter as follows:

- site data must be recorded in a form compatible with the Queensland Herbarium CORVEG database.
- the minimum site size must be 10 by 50 metres;
- a complete list of species present at each site must be recorded;
- the relative abundance of plant species present must be recorded;
- any plant species of conservation, cultural, commercial or recreational significance must 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.

Sensitive or important vegetation types must be highlighted, including any riparian vegetation and natural grasslands, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare or threatened species must be specifically addressed. The surveys must include species structure, assemblage, diversity and abundance. The description must contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests. Any special landscape values of any natural vegetation communities must also be described.

The location of any horticultural crops in the vicinity of the site must be shown.

The extent of occurrence of important local and regional pest plants (weeds), particularly declared plants under the *Land Protection (Land and Stock Route Management) Act 2002* must be shown on a map at an appropriate scale. A weed management strategy will be required.

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

The terrestrial and riparian fauna occurring in the areas affected by the Proposal must 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 must include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the location and estimated population of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment,

feeding and movement requirements, and current level of protection (e.g. any requirements of protected area management plans);
- use of the area by migratory birds, nomadic birds, and other terrestrial fauna; and
- the location and estimated population of feral or pest animals.

The EIS must indicate how well any affected communities are represented and protected elsewhere in the province where the Proposal occurs.

4.7.2.2 Potential Impacts and Mitigation Measures

Describe the nature and extent of impacts to flora and fauna species that will result from direct disturbances to terrestrial habitats, including the clearing and inundation of vegetation communities associated with the dam and pipeline infrastructure construction and operation. Provide an assessment of the long-term impacts on these communities with particular emphasis on the disruption to wildlife movements between areas of known and or protected biological diversity.

The potential environmental harm to the ecological values of the area arising from the construction, and operation of the Proposal including clearing, salvaging or removal of vegetation must be described, and the indirect effects on remaining vegetation must be discussed. Proposals to minimise the impacts on vegetation must be described and must address the conservation, such as by relocation, of protected plants and retaining vegetation in the dam footprint until water levels warrant its removal. Provide an assessment of the impacts of placing the inundation area within the State Wildlife Corridor that links Girraween National Park with Sundown National Park to the south west and large areas of State Forest to the north west.

The potential environmental harm on flora and fauna due to any alterations to the local surface and ground water environment must be discussed with specific reference to environmental impacts on riparian vegetation or other sensitive vegetation communities. Measures to mitigate the environmental harm to habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains must be described. Discuss the potential for fauna to be trapped in open trenches during construction of the pipeline and how this can be reduced.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory and nomadic animals must be discussed.

Weed management strategies are required for containing existing weed species (e.g.. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area*, i*n accordance with the *Land and Protection (Pest and Stock Route Management) Act 2002* and relevant local plans and strategies*.* Pest animal management strategies and practices must also be addressed. The study must develop strategies to ensure that the Proposal does not contribute to increased encroachment of a feral animal species. Reference must be made to the local government authority's pest management plan when determining control strategies.

Rehabilitation of disturbed areas must incorporate, where appropriate, provision of nest hollows and ground litter.

4.7.3 Aquatic Flora and Fauna

4.7.3.1 Description of Environmental Values

If no recent biota surveys/studies have been conducted in and downstream of the Proposal area, the aquatic flora and fauna occurring in the areas affected by the Proposal must be described from studies undertaken, noting the patterns and distribution in the waterways and/or associated aquatic environments.

This section must provide a description of the habitats and flora compositions (using maps) potentially impacted by the Proposal, including distribution of pool and riffle formations; presence of snags, overhanging vegetation, aquatic macrophytes, sand and gravel bars; sediment type; river profile (bank width and depth). The description should include the habitat requirements and the sensitivity of aquatic flora species to changes in flow regime, water levels and water quality in the Proposal areas. The discussion of the flora present or likely to be present at any time during the year must include, but not be limited to, the following habitats:

- in-stream pools/runs;

- in-stream riffles/rapids;
- off-stream perennial pools (billabongs, ox-bow lakes etc); and
- off-stream ephemeral pools.

The aquatic vegetation in the area affected by the Proposal must be described, noting:

- the extent and location of rooted aquatic vegetation communities;
- the presence and current extent of free-floating aquatic vegetation;
- the presence of any rare, threatened or otherwise noteworthy aquatic species or communities downstream of the site of the Proposal or within watercourses which will be inundated;
- the presence of any introduced significant local and regional weed species ;and
- the significance of aquatic vegetation to native fauna.

A description of the habitat requirements and the sensitivity of aquatic flora species to changes in flow regime, water levels and water quality in the Proposal areas must be described. Special requirements of aquatic plant species or communities, including exotic species, related to management of the impoundment or flow regime downstream of the Proposal site must be discussed. A description of the known extent of introduced invasive species in the Severn River system must be presented. The impact of existing impoundments and downstream flow regime on the natural aquatic flora must be discussed. Reference should be made to relevant studies on the Severn River and other similar catchments to estimate the natural state.

The location of significant local and regional weed species in the vicinity of the Proposal site must be shown.

The extent of occurrence of rare or threatened species must be specifically addressed. The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

The aquatic fauna occurring in the areas affected by the Proposal must be described noting the patterns and distribution in the waterways. A description of the habitat requirements and the sensitivity of aquatic fauna species to changes in flow regime, water levels and water quality in the Proposal areas must be described. There must be a discussion of how well any affected communities are represented and protected elsewhere, the migratory patterns of aquatic fauna species in the study area. The assessment of the fauna present or likely to be present must include:

- diversity and abundance (where feasible and practicable) of animals, including fish, reptiles, aquatic mammals, macro invertebrates, and amphibians occurring in the waterways within the Proposal areas (movement requirements must be considered and their seasonal variations);
- any rare or threatened species and their habitat;
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement;
- a description of the conditions necessary for migration of potentially affected species including minimum flows, seasonal conditions, stream characteristics and migratory behaviour;
- a description of the capacity of artificial devices (e.g., fish ladders) to emulate natural conditions and support and sustain successful migration (this should include a review of the success of existing similar structures used elsewhere);
- commercial and recreational fish species which are present within the waterways; and
- introduced significant local and regional pest species.

4.7.3.2 Potential Impacts and Mitigation Measures

Provide an assessment of potential impacts on aquatic flora impacted by the Proposal including:

- changes to flow regime downstream based on the proposed flow regime and resultant changes to habitat (pools, riffles, bank stability, connections to wetlands, etc) and consequential floristic changes, including the effect of changes in salinity, sediment, nutrients, etc;
- effects of increased level in the impoundment and projected impacts of variations in the level of the impoundment on aquatic and riparian habitat (e.g. pools, riffles) and flora, particularly in creeks flowing into the impoundment;
- effects of changes to flow regimes on spawning and breeding of animals both within the inundation area and downstream, including the Sundown National Park;
- potential for regeneration around the Proposal;

- the importance of the habitat types at the Proposal site in the context of the river system and the proportion of comparable habitat elsewhere in the system;
- effect of floristic changes on the aquatic fauna habitat and food supply both within any impoundment and downstream to marine areas;
- the impact of proposed in-stream structures including water off takes, dam infrastructure, changed transport infrastructure and fish transfer devices;
- the potential for, and mitigation measures to prevent, the creation of new mosquito and biting midge breeding sites (including during construction e.g. in quarries and borrow pits);
- proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that would restrict free movement of fish and measures to avoid impacts upon fish spawning periods;
- impacts of barriers to interbreeding opportunities between populations;
- an assessment of the potential for the incidence of blue-green algae outbreaks as a result of the Proposal must be detailed, along with potential mitigation and management measures;
- identification of the conservation importance of identified populations at the regional, state and national levels; and
- determination of the potential for the introduction of or facilitation of exotic, non-indigenous and noxious plants and animals.

This section must also assess the sensitivity of habitats and their species composition to all foreseen direct and indirect effects, including potential disturbances and changes resulting from the proposed works, e.g. changes in water quality and the potential changes to species populations including faunal species movement requirements (including any seasonal changes to those requirements). Specific attention should be given to rare or threatened species and strategies for protecting these species must be described, and any obligations imposed by State and Australian government threatened species legislation or policy must be discussed.

Impacts during construction and operation of the Proposal must be assessed in the context of both short and long term durations. Measures to mitigate the impact on habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains must be described. Any provision for buffer zones and movement corridors, or special provisions for migratory, nomadic and aquatic animals must be discussed.

Consideration of the cumulative impacts from existing disturbances and the proposed disturbance to the aquatic ecosystem and the ability of the ecosystem to absorb the additional impact of the Proposal must be presented. Consideration of the cumulative impacts from targeted development arising from the provision of water through the Proposal on aquatic fauna, habitat and fisheries must be presented. Sufficient baseline data at the Proposal site and up and downstream of the site must be provided to determine changes.

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 will be required that will describe indigenous and non-indigenous cultural heritage sites and places, and their values. A permit to conduct the research and survey will be required under the provisions of the *Aboriginal Cultural Heritage Act 2003* and/or the *Queensland Heritage Act 1992*.

Any such study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- ***l***iaison 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, including all associated infrastructure and easements 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; and
- 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.

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.

The environmental harm to cultural heritage values in the vicinity of the Proposal must be managed under a cultural heritage management plan (CHMP) developed specifically for the Proposal. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the Proposal 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 must address and include the following:

- a process for including Aboriginal people associated with the development areas in protection and management of indigenous cultural heritage;
- processes for mitigation, management and protection of identified cultural heritage places and material in the Proposal areas, including associated infrastructure developments, both during the construction and operational phases of the Proposal;
- 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 Proposal staff; and
- a conflict resolution process.

The development of the CHMP must be negotiated with the lead agency, the Department of Natural Resources and Water.

Any collection of artefact material as part of a mitigation strategy will need to be done by an appropriately qualified cultural heritage practitioner holding a permit under provisions of the *Aboriginal Cultural Heritage Act 2003*.

4.9 Transport

4.9.1 Transport Methods and Routes

Describe arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction and operational phases of the Proposal. The description must address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure.

Information must be provided on road transportation requirements on public roads for both construction and operations phases, including:

- the volume, composition (types and quantities), origin and destination of goods to be moved including construction materials;
- the volume of traffic generated by workforce personnel, visitors and service vehicles;
- method of movement (including vehicle types and number of vehicles likely to be used);
- anticipated times at which movements may occur;
- details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition); and
- the proposed transport routes.

4.9.2 Potential Impacts and Mitigation Measures

The EIS must provide sufficient information to make an independent assessment of how the state-controlled and local government road networks will be affected by the Proposal. Sufficient information must also be provided to enable an independent assessment of how the rail network (including infrastructure) will be affected. In both cases the impact on stakeholders along all transport routes must be detailed and how any impacts will be managed.

The EIS must include a detailed analysis of the impact of construction and operational traffic generated by the Proposal with particular concern for impacts on road infrastructure, road users and road safety.

The EIS must consider the potential impacts of haulage of construction inputs, such as pipe and other materials, on public roads and consider impact mitigation costs when choosing the mode of haulage (road vs. rail). If haulage is undertaken by road, impacts must be addressed in a Transport/Traffic Management Plan as part of the Environmental Management Plan.

The EIS must also assess potential impacts and propose mitigation measures, if necessary, for the following:

- road safety issues arising from any need for diversion of traffic during construction of the Proposal, especially laying pipeline in or near road reserves;
- need for increased road maintenance and upgrading; and
- environmental values of any new roads or road realignments not covered elsewhere in the EIS.

The EIS needs to identify impacts on the state-controlled and local government road networks and to indicate clearly the corrective measures necessary to address adverse road impacts and the costs involved. This will require the proponent to compare the traffic situation and road conditions with, and without, the Proposal. In assessing road impacts of the Proposal, the proponent should use the Department of Main Roads "Guidelines for Assessing Road Impacts of Development (2006)", which is available at www.mainroads.qld.gov.au > Inside Main Roads > Publications > Road Related.

Information about the impacts and proposed measures for dealing with those impacts must be prepared by the proponent in close consultation with the local district office of the Department of Main Roads.

The EIS must provide details of the impact of the Proposal on any current or proposed rail infrastructure.

Provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport nodes of the Proposal. Indicate whether there is a need to update the plans based on increase in frequency of traffic and volumes to be transported.

Additional water transport issues that must be considered include the potential of the Proposal to impact on recreational craft in the river.

4.10 Social Environment

4.10.1 Description of Environmental Values

This section describes the existing social values that may be affected by the Proposal.

The social amenity and use of the Proposal area and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential purposes must be described. Consideration must be given to:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area;

- health and educational facilities;
- on-farm activities near the proposed activities;
- number of properties directly affected by the Proposal; and
- number of families directly affected by the Proposal, this must include not only property owners but also families of workers either living on the property or workers where the property is their primary employment.

Describe the social values for the affected area in terms of the integrity of social conditions, including amenity and liveability, harmony and well being, sense of community, access to recreation, and access to social and community services and infrastructure.

Social, economic and cultural values are not as easily separated as physical and ecological values. Therefore it may be necessary for some material in this section to be cross-referenced with section 4.9 Cultural Heritage and section 4.11 Economy.

4.10.2 Potential Impacts and Mitigation Measures

This section defines and describes the objectives and practical measures for protecting or enhancing social values, describes 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 social impact assessment of the Proposal must consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the Proposal's impact, both beneficial and adverse, on the local community. The impacts of the Proposal on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The social impact assessment must include sufficient data to enable state authorities, such as Queensland Health and Education Queensland, to plan for the continuing provision of public services in the region of the Proposal. Proponents of proposals that are likely to result in a significant increase in population of an area must consult the relevant management units of the state authorities, and summarise the results of the consultations in the EIS. The summary must discuss how the impacts of population increase on public services, particularly health and education, would be mitigated.

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

Taking into account the relevant demographic, social, cultural and economic profiles, provide an assessment of impacts on:

- local residents, current land uses and existing lifestyles and enterprises, including land acquisition and relocation issues and property valuation and marketability, community services and recreational activities;
- local and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. In relation to the source of the workforce, information is required as to whether the proponent, and/or contractors, is likely to employ locally or through other means and whether there are initiatives for local employment opportunities;
- construction and operational workforces and associated contractors on housing demand, community services and community cohesion. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the Proposal is to be discussed;
- any new skills and training to be introduced in relation to the Proposal. Adequate provision must be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated must be indicated; and
- service revenue and work from the Proposal (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the Proposal, particularly if a fly-in, fly-out workforce is proposed.

Discuss the potential environmental harm on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, or scientific or residential purposes. Describe the implications of the

Proposal for future developments in the local area including constraints on surrounding land uses.

The educational impacts of the proposed development are to be analysed and described, particularly in regard to:

- primary, secondary and tertiary educational sectors;
- improved appreciation of conservation areas; and
- environmental education for the general public.

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

4.11 Economic Environment

4.11.1 Description of Environmental Values

This section describes the existing economic environment that may be affected by the Proposal. The character and basis of the local and regional economies must be described including:

- economic viability (including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc);
- current property values; and
- historical descriptions of large-scale developments and their effects in the region.

The economic impact statement must include estimates of the opportunity cost of the Proposal and the value of ecosystem services provided by natural or modified ecosystems to be disturbed or removed during development.

4.11.2 Potential Impacts and Mitigation Measures

The function of this section is to define and describe the objectives and practical measures for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic management, and how the achievement of the objectives will be monitored, audited and managed.

An economic analysis, including a cost-benefit analysis, must be presented from national, state, regional and local perspectives as appropriate to the scale of the Proposal. The general economic benefits from the Proposal must be described.

At a level of detail appropriate to the scale of the Proposal, the analysis is to consider:

- the significance of this Proposal on the local and regional economic context;
- the long and short-term beneficial (e.g.. job creation) and adverse (e.g.. competition with local small business) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the Proposal by local businesses or communities;
- the cost to all levels of government of any additional infrastructure provision;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the economic impacts of the Proposal on individuals, businesses, industries or communities, including proposed measures to mitigate any negative impact. Particular attention should be given to the extent and economic importance of any primary industries that occur within the area directly affected by the Proposal and identify any sites that may be impacted upon by the Proposal. This description should include the local and regional industrial water users, their current average volume requirements for water the use and purpose of the water used;
- the potential economic impact of any major hazard identified in section 4.13;
- the distributional effects of the Proposal including proposals to mitigate any negative impact on disadvantaged groups;
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future; and
- impacts on local property values.

Consideration of the impacts of the Proposal in relation to energy self-sufficiency, security of supply and balance of payments benefits may be discussed. Attention must be directed to the long and short-term effects of the Proposal on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies must 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 must also be recommended.

4.12 Hazard and Risk

4.12.1 Hazard and Risk Assessment

This section describes the potential hazards and risk that may be associated with the Proposal.

An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the Proposal on sensitive areas and resources such as forests, water reserves, State and local Government controlled roads, places of residence and work, and recreational areas.

A preliminary risk assessment for all components of the Proposal (dam wall, quarries, clearing, downstream flooding) shall be undertaken as part of the EIS process in accordance with appropriate parts of AS/NZS Risk Management Standard 4360:1999.

This section defines and describes the objectives and practical measures for protecting people and places from hazards and risk, describes how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed.

Detail the environmental values likely to be affected by any hazardous materials and actions incorporated in the Proposal. The degree and sensitivity of risk must be detailed.

4.12.2 Risk Management Plans

The proponent must develop an integrated risk management plan for the whole of the life of the Proposal including construction and operation phases. The plan must include a preliminary hazard analysis (PHA), conducted in accordance with appropriate guidelines for hazard analysis (e.g. HAZOP Guidelines, NSW Department of Urban Affairs and Planning (DUAP)). The assessment must outline the implications for and the impact on the surrounding land uses, and must involve consultation with Department of Emergency Services, Queensland Fire and Rescue Authority, and Queensland Ambulance Service. The preliminary hazard analysis must incorporate:

- all relevant majors hazards both technological and natural;
- the possible frequency of potential hazards, accidents, spillages and abnormal events occurring;
- indication of cumulative risk levels to surrounding land uses;
- life of any identified hazards;
- description of processes, type of the machinery and equipment used;
- potential wildlife hazards such as crocodiles, snakes, and disease vectors; and
- public liability of the State for private infrastructure and visitors on public land.

The plan must include the following components:

- operational hazard analysis;
- regular hazard audits;
- fire safety, emergency;
- response plans;
- qualitative risk assessment; and
- construction safety.

Where relevant, each of these components must be prepared in accordance with the relevant NSW DUAP

Hazardous Industry Planning Advisory Paper (HIPAP).

4.13 Cumulative Impacts

The purpose of this section is to provide clear and concise information on the overall impacts of the Proposal, and to discuss the interrelationship of these impacts. This is in addition to the discussion of cumulative impacts which feature in the relevant sections. The cumulative impacts as they relate to particular issues (e.g. air, water, cultural heritage, social, noise) may also be discussed in this section. These impacts must be considered over time or in combination with other impacts because of the scale, intensity, duration or frequency of the impacts. In particular, the requirements of any relevant State Planning Policies, EPPs, National Environmental Protection Measures and any relevant Integrated Catchment Management Plans must be addressed.

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

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 Proposal are described, with the corresponding sections of the ToR.

5 Environmental Management Plan

The environmental management plan (EM Plan) must be developed from the mitigation measures detailed in part 4 of the EIS. Its purpose is to set out the proponents' commitments to environmental management that is, how environmental values will be protected and enhanced.

The EM Plan is an integral part of the EIS, but must be capable of being read as a stand-alone document without reference to other parts of the EIS. The general contents of the EM Plan must comprise:

- the proponents' commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental harm, performance standards and associated measurable indicators, performance monitoring and reporting;
- impact prevention or mitigation actions to implement the commitments;
- corrective actions to rectify any deviation from performance standards; and
- the description of and timeframes for implementation of compensatory habitat measures and offsets developed for loss of flora and fauna habitats.

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

For further information, see the EPA guideline "Preparing Environmental Management Plans".

6 References

All references consulted must 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 must 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 must 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, must also be provided in section 4.14 of the EIS. For this purpose the ToR must be line numbered.

A2. Development Approvals

A list of all the approvals (including local law approvals) required by all phases of the Project must be presented (in the expected sequencing of applications) along with their corresponding regulating legislation and the approving authority.

A3. Potential Impacts on Matters of National Environmental Significance

The EIS must provide a stand-alone report that exclusively and fully addresses the issues relevant to the matters of national environmental significance (NES) that were identified in the 'controlling provisions' when the Proposal was declared a controlled action under Part 3, Division 1 of the EPBC Act.

Listed threatened species and communities that may be impacted by the proposed development include (and any additional threatened species listed under the EPBC Act and not listed below which may be impacted by the Proposal):

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland *(*Critically Endangered);
- *Acacia pubifolia (*vulnerable*);*
- *Babingtonia granitica* (vulnerable)*;*
- *Boronia granitica* (endangered*);*
- *Cadellia pentastylis* (vulnerable*);*
- *Callistemon pungens (*vulnerable*);*
- *Digitaria porrecta* (endangered)*;*
- *Goodenia macbarronii* (vulnerable)*;*
- *Homoranthus montanus* (vulnerable)*;*
- Squatter Pigeon *(Geophaps scripta scripta*) – vulnerable;
- Swift Parrot (*Lathamus discolor*) – endangered;
- Black-throated Finch (*Poephila cincta cincta)* – endangered;
- Regent Honeyeater (*Xanthomyza phrygia*) – endangered;
- Spotted-tail Quoll (*Dasyurus maculatus maculatus*) – endangered; and
- Brush-tailed Rock-wallaby (*Petrogale penicillata*) – vulnerable.

The stand-alone report must follow the following template outline.

i) Introduction

ii) Description of Proposed Action (as it would impact on NES matters)

iii) Description of the Affected Environment Relevant to the Controlling Provisions (i.e. describe the features of the environment that are NES matters protected under the EPBC Act)

iv) Assessment of Impacts on NES Matters and Mitigation Measures

v) Conclusions

vi) References

The description and analysis of the potential impacts of the Proposal must address all aspects of the Proposal. All discussion of the potential impacts of the Proposal must address both potential direct and indirect impacts. The stand-alone report must discuss the presence and environmental requirements of any species of flora or fauna or ecological community, listed as threatened under the EPBC Act, potentially impacted by the proposed development.

A4. Study Team

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

A5. Consultation Report

The summary Consultation Report appendix for an EIS under the SDPWO Act must commence by including the details of affected and interested persons, and the statement of planned consultation with those persons, originally provided with the ToR for an EIS. It must describe how 'interested' and 'affected persons,' and any 'affected parties' as defined in the EPBC Act, were identified.

A further list must be provided that includes the Australian, State and local government agencies consulted, and the individuals and groups of stakeholders consulted.

The Consultation Report appendix must 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 must include the methodology used in the community consultation program including criteria for identifying stakeholders and the communication methods used.

A6. Specialist Studies

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

- geology;
- soil survey and land suitability studies;
- waterway and groundwater hydrology;
- land use and capability studies;
- flora and fauna studies;
- economic and social studies, cost-benefit analyses;
- transport and traffic studies; and
- hazard and risk studies.

A7. Research

Any proposals for researching alternative environmental management strategies or for obtaining any further necessary information must be outlined in an appendix.

A8. List of Proponent Commitments

A list of all commitments made by the proponent in the EIS (in addition to the performance criteria stipulated in the EM Plan) must be provided along with a reference to the relevant section in the EIS.