

**SOUTHERN REGIONAL
WATER PIPELINE PROJECT**

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

MARCH 2006

Preamble

Project Proponent

SRWP Co is a company incorporated under the *Corporations Act 2001*. It is a subsidiary of SEQ Water Incorporated. The shareholders of SRWP Co are as follows:-

- SEQ Water 51%
- Ipswich City Council 13%
- Logan City Council 13%
- Gold Coast City Council 13%
- Beaudesert Shire Council 5%
- Brisbane City Council 5%

SRWP Co has been specifically created to build, own and operate the Southern Regional Water Pipeline, a high pressure water transmission network in south-east Queensland to provide a bulk water supply network to the southern region.

Project Summary

SRWP Co is proposing to build, own and operate approximately 120km of high pressure water transmission pipeline from Camerons Hill Reservoir to Helensvale, via Swanbank, North Beaudesert and Logan. An additional spur line will run from the Kuraby reservoir and connecting with the main line at a pump station located at Chambers Flat.

The pipeline will be compatible to connection with proposed future water resource developments such as Cedar Grove and Wyaralong reservoir.

The proposed pipeline route will traverse land under the jurisdiction of several Local Government Bodies and possibly Commonwealth Government Bodies.

SRWP Co has prepared an initial Advice Statement (IAS) which provides further detail relating to the Project, which can be viewed at www.coordinatorgeneral.qld.gov.au

Administrative Details for these Terms of Reference

The Southern Regional Water Pipeline Project was on 29 September declared a significant project by the Coordinator-General (CG) pursuant to Section 26 of the *State Development and Public Works Organisation Act 1971* (the 'SDPWOA') for which an Environmental Impact Statement ('EIS') is required. SRWP Co is now required to prepare an EIS about the project to address the TOR when they are finalised.

SRWP Co will refer the project to the Commonwealth Minister for the Environment and Heritage for a decision as to whether the project constitutes a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) ('the EPBC Act').

If the Project is declared a controlled action, the Project will require approval under Part 9 of the EPBC Act before it can proceed.

If assessment is required under the EPBC Act, the EIS will be required to address both State and Commonwealth requirements. The EIS will be undertaken in accordance with requirements of the bilateral agreement between the Australian Government and the Queensland Government which accredits Queensland's assessment process for significant projects under the SDPWO Act.

State and Local Government representatives will be invited to participate in the EIS process as Advisory Bodies for the EIS and will be requested, in the first instance to examine the IAS and comment on the draft TOR. The IAS and draft TOR will also be provided for public comment. The CG will have regard to the comments received from the Advisory Bodies and the public when finalising the TOR for the EIS. The TOR will then be provided to SRWP Co. to prepare the EIS.

When SRWP Co has prepared the EIS to the satisfaction of the CG, it will be made available for public (including the Advisory Bodies) and submissions will be invited. SRWP will have 2 years (unless otherwise determined by the CG) in which to prepare the EIS and provide it to the CG. The submissions will be provided to SRWP Co to consider and respond to the issues raised in the submissions. The CG may request that the proponent prepare a Supplement to the EIS to address the issues raised in the submissions.

When the CG has sufficient information to evaluate the EIS, the CG will prepare a report evaluating the EIS and make recommendations or conditions about the project. The CG's report will be made publicly available on the CG's website and will be provided to relevant government decision makers.

[To build and operate the water pipeline, SRWP Co may require development approvals under planning schemes or a designation as community infrastructure under the *Integrated Planning Act 1997* and permits and authorities under legislation such as the *Water Act 2000* or the *Environmental Protection Act 1994* (the 'EP Act').]

The TOR provides information in two broad categories:

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

The Department's Project Manager for the EIS is:

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

1. INTRODUCTION

The Terms of Reference ('the TOR') for an Environmental Impact Statement ('the EIS') for the Southern Regional Water Pipeline has been prepared in accordance with sections 29 and 30 of the *State Development & Public Works Organisation Act 1971* (the 'SDPWO Act').

The objective of the TOR is to identify those matters that should be addressed in the EIS. The TOR is based on the outline of the proposed Project given in the Initial Advice Statement (IAS).

In order to clarify the nature and level of investigations that are envisaged in the TOR, the Proponent may consult further with relevant Government Bodies (known as Advisory Bodies), peak community interest organisations and groups as necessary during the preparation of the EIS to ensure that the TOR are addressed.

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

An executive summary should be provided in the EIS and be able to be provided separately for public information.

2. EIS OBJECTIVES

The objective of the EIS is to identify potential environmental, social and economic impacts and to ensure that impacts are avoided where possible. Unavoidable impacts (direct, indirect and cumulative) must be examined full and addressed, so that the development of the Project, including the selection of the preferred pipeline alignment, is based on sound environmental protection and management criteria. Consistent with this objective, the EIS should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts. This document should provide:

- For interested bodies and persons: a basis for understanding the Project, alternatives and preferred solutions, the existing environment that would be affected, both on and off the site, the impacts that may occur, and the measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in land: an outline of the effects of the proposed Project on that land including access arrangements.

- For the CG and other Government decision makers: a framework against which decision-makers are able to consider the environmental aspects of the proposed Project in view of legislative and policy provisions and decide whether the Project can proceed; as appropriate, set conditions for approval to ensure environmentally sound development and, where required by legislation, recommend an environmental management and monitoring program.
- Commonwealth matters of National Environmental Significance: to be specifically addressed under the requirements of the *EPBC Act* are, but should not be limited to, the following:
 - sections 18 and 18A – listed threatened species and communities
 - *Endangered*
 - Swift Parrot (*Lathamus discolor*)
 - Coxen’s Fig-Parrot (*Cyclopsitta diophthalma coxeni*)
 - Regent Honeyeater (*Xanthomyza phrygia*)
 - Southern Barred Frog (*Mixophyes iterates*)
 - Native Jute (*Corchorus cunninghamii*)
 - *Plectranthus habrophyllus*
 - Shiny-leaved Condoe (*Pouteria eerwah*)
 - *Vulnerable*
 - Lungfish (*Neoceratodus forsteri*)
 - Collared Delma (*Delma torquata*)
 - Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*)
 - Floyd’s Walnut (*Endiandra floydii*)
 - Spiny Gardenia (*Randia moorei*)
 - *Fontainea venosa*
 - Macadamia Nut (*Macadamia intergrifolia*)
 - Lloyd’s Olive (*Notelaea lloydii*)
 - Hairy-joint Grass (*Arthraxon hispidus*)
 - Miniature Moss-orchid (*Bulbophyllum globuliforme*)
 - Frogbit (*Hydrocharis dubia*)
 - sections 20 and 20A – listed migratory species
 - Swift Parrot (*Lathamus discolor*)
 - Coxen’s Fig-Parrot (*Cyclopsitta diophthalma coxeni*)
- For the Proponent: a definitive statement of measures or actions to be undertaken to minimise any adverse impacts during and following the implementation of the proposed Project. A draft Environmental Management Plan (EMP) that describes acceptable impacts and environmental management strategies to agreed performances criteria is the recommended means of achieving this objective.

The Proponent is required to address the TOR to the satisfaction of the CG before the EIS is made publicly available. It should be noted that the CG does not evaluate the EIS until public notification is completed and the CG has obtained any other material that the CG considers relevant to the Project including additional information or comment about the EIS and the Project from the Proponent. .

3. GENERAL EIS GUIDELINES

The key principle is that there should be sufficient detail presented in the EIS to enable readers to judge the impact of the Project on the natural and built environment. The EIS should be a standalone document. It should contain sufficient information from the route selection criteria and other appended studies to avoid the need to search out previous reports.

It should be acknowledged that readers are likely to include representatives of Commonwealth, State and Local Governments, special interest groups and the general public.

The EIS should relate to the entire life of the project including construction, operation, maintenance, and decommissioning (including rehabilitation) of all Project related sites. The EIS should enable reasonable economic and technically achievable conditions to be developed to ensure that the impact of the Project is reduced to acceptable levels.

The EIS should state the following information, assessments and assumptions in the EIS:

- The source of the material with appropriate references
- How recent the material is;
- How the reliability of the material was tested; and
- Any uncertainties in the material

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

The level of analysis and detail in the EIS should reflect the level of significance of the expected impacts on the environment.

Any prudent and feasible alternatives should be discussed and treated in sufficient detail, and reasons for selection of the preferred option should be clearly identified.

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

The term “detail” and “discuss” should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate. Should SRWP Co require any information in the EIS to remain confidential, this should be clearly indicated, and separate information should be prepared on these matters.

The term “Project” includes all activities undertaken on lands covered by the proposed pipeline corridor, pump station facilities, balance tank sites, any right-of-way (ROW) necessary for construction purposes and supporting infrastructure.

Copies (number to be advised) of the prepared EIS should be lodged with the CG for distribution to Advisory Bodies for comment and review during the public review period. In addition, an electronic version of the EIS will be made publicly available on the CG’s website. A quantity of the EIS documents should also be prepared for distribution to relevant interstate and intrastate libraries and other key Government offices. There is a preference for documents to be made available in CR ROM format, however a quantity of hard copy documents should also be produced.

While every attempt has been made to ensure these TOR address all the major issues associated with this Project, they are not necessarily exhaustive and should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them or matters (currently unforeseen) that emerge as important or significant during the completion of scientific studies, from public consultation, or otherwise, during the course of preparation of the EIS.

4. STAKEHOLDER CONSULTATION

To facilitate the assessment process, the Proponent is strongly encouraged to regularly consult with Advisory Bodies and other appropriate stakeholders throughout the EIS process.

It is the responsibility of the Proponent, in consultation with Advisory Bodies, 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 Bodies and on request to relevant individuals and peak groups with an interest in the Project.

5. GENERAL EIS FORMAT

The EIS should preferably be written in a format matching the TOR or indicate clearly how the EIS responds to the each aspect of the TOR.

The EIS must include appendices containing at least the following:

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

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

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS should also be produced on CD ROM. These versions should be in ADOBE *.pdf format for placement on the internet. All compression must be down-sampled to 72 dpi (or ppi). PDF documents should be no larger than 500kB in file size.

The Executive Summary should be supplied in HTML 3.2 format with a *.jpg graphics files. Text size and graphic files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500kB file size.

TOR GLOSSARY

The following abbreviations have been used in this document:

AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
CHMP	Cultural Heritage Management Plan
CO	Carbon Monoxide
CG	The Coordinator-General
DLGPSR	Department of Local Government and Planning, Sport and Recreation
DMR	Department of Main Roads
DNRM	Department of Natural Resources and Mines
DPI&F	Department of Primary Industries & Fisheries
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	<i>Environment Protection Act 1994</i>

EPA	Environment Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act (Cth) 1999</i>
ERA	Environmentally Relevant Activity
ESD	Environmentally Sustainable Development
IAS	Initial Advice Statement as described in Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>
NES	National Environmental Significance as defined by the <i>Environment Protection & Biodiversity Conservation Act (C'wlth) 1999</i>
NOx	Oxides of Nitrogen
NTRB	Native Title Representative Bodies
ROW	Right-of-Way
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
TOR	Terms of Reference as described in Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>

Part B – Specific Requirements – Contents of the EIS

The EIS Report shall address the following matters and may be structured with similar headings to the Terms of Reference.

TITLE OF PROPOSED DEVELOPMENT

NAME AND ADDRESS OF PROPONENT

EXECUTIVE SUMMARY

The Executive Summary should be written as a stand alone document, able to be reproduced on request for interested parties who may not wish to read or purchase the EIS as a whole. The structure of the Executive Summary should follow that of the EIS, though focussed strongly on the key issues allowing the reader to obtain a clear understanding of the proposed Project, its environmental and socio-economic implications and management objectives. The summary should include:

- The title of the Project
- Name and contact details of the Proponent, and a discussion of previous projects undertaken by the Proponent or associated entities
- A concise statement of the aims and objectives of the Project
- The legal framework, decision making authorities and advisory Bodies
- An outline of the background to and need for the Project, including the consequences of not proceeding with the Project
- An outline of the alternative options considered and reasons for the selection of the proposed development option
- A brief description of the Project (pre-construction, construction and operational activities) and the existing environment, utilizing visual aids where appropriate
- An outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimization and management) and commitments to minimise the significance of these impacts.

GLOSSARY OF TERMS

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

1. INTRODUCTION

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

1.1 Project Description

This section should provide a brief description, including a summary of any major associated infrastructure requirements of the key elements of the Project. Detailed descriptions should follow in the appropriate sections.

A brief description should be provided of studies, Government Policies or surveys undertaken for the purposes of developing the Project and preparing the EIS.

1.2 Project Objectives

This section should:

- State objectives leading to the development of the proposal
- Outline events leading up to the proposed Project's formulation, including alternatives, envisaged time scale for implementation and project life, and action taken already within the Project area

1.3 Project Proponent

This section should describe the experience of the Project Proponent (or associated entities), including the nature and extent of business activities, experience and qualifications, and environmental record including the Proponent's environmental policy.

1.4 The Environmental Impact Assessment Process

1.4.1 Methodology of the EIS

This section should provide an outline of the impact assessment process steps, timing and decisions to be made for relevant stages of the Project, including compliance with regulatory requirements, referral to final TOR, and types of information detailed within the EIS and any complementary or subsequent documentation (i.e. technical background paper).

1.4.2 Objectives of the EIS

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

The audience should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the Project. The information in this section is required to ensure:

- That relevant legislation is addressed;
- There is an awareness of the process to be followed; and
- That stakeholders are aware of any opportunities for input and participation.

1.5 Public Consultation Process

This section should outline the public consultation process that has taken place during EIS preparation and the results of such consultation. It should outline any further opportunities for public input on the draft EIS report

The public consultation program should provide opportunities to encourage and facilitate active community involvement and education through public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms.

The public consultation process should identify broad issues of concern to local community and interest groups at all stages from project planning, through construction, commissioning, operations and final decommissioning.

1.6 Project Approvals

1.6.1 Relevant Legislation and Policy Requirements

This section should identify and explain the legislation and policies controlling the approvals process. Reference should be made to the *Environment Protection Act 1994*, *State Development and Public Works Organisation Act 1971*, the *Coastal Protection and Management Act 1995*, the *Coastal Protection and Management Regulation 2003*, the *Integrated Planning Act 1997*, the *Integrated Planning Regulation 1998*, the *Nature Conservation Act 1992* and the *Queensland Heritage Act 1992* and other relevant Queensland laws. A description of the Environmentally Relevant Activities (ERAs) necessary for each aspect of the Project should be given.

Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, including the results of a Referral should also be included.

1.6.2 Planning Processes and Standards

This section should outline the Project's consistency with existing land uses or long term policy framework for the pipeline route, and in particular in relation to the SEQ Regional Infrastructure Plan developed by the Office of Urban Management; the Regional Water Supply Strategy Stage 2; the State Coastal Management Plan 2001 and the draft SEQ Regional Coastal Management Plan 2004, developed by the Environmental

Protection Agency; and with legislation, standards, codes or guidelines available to monitor and control operations on site. It should refer to all relevant State and regional planning policies. This information is required to demonstrate how the proposal conforms to State, regional and local policies for the area.

2. PROJECT SUBSTANTIATION

2.1 Need for the Project

The EIS should address the specific objectives and justification for the proposal. Issues to be addressed include:

- Strategic, economic and environmental implications of the proposal including future water consumption and production and supply security and flexibility of distribution.
- Impact on other water users of increased demands on existing water supplies (i.e. consumption and stored levels of water)
- Longer term strategic implications of the proposal in terms of a water distribution network in South East Queensland, upgrade of existing infrastructure, integration with other supply systems (e.g. recycled water) and interconnection with future water supply sources
- Identification of customer demands for water and the implications of developing a regional wide basis for the funding of capital and operating costs of this and associated infrastructure
- Appropriate timing and sizing of the pipeline or sections of the pipeline for regional water supply security purposes giving due consideration to current risks to supply and possible new regional sources of supply
- Design implications associated with possible new sources of supply, in particular, desalination
- The Project's compatibility with the National Water Initiative, Government Ecologically Sustainable Development policy, Queensland Natural Resources (Water) Policy, National Strategy on Conservation of Australia's Biological Diversity; with water reform under the National Competition Policy; and any other relevant policy.

Deleted: ie

2.2 Costs and Benefits to Consumers and the Wider Community

This section should summarise:

- Alternative routes considered, including possible alignment with the proposed Southern Infrastructure Corridor, aided by maps and diagrams. The route options highlighting the preferred route, should be shown on topographical maps at a suitable scale.
- The rationale for selection of the preferred corridor and reasons other options were rejected.

3. DESCRIPTION OF THE PROJECT

The EIS should provide detailed description of construction, commissioning, operation and decommissioning stages (including rehabilitation) of the Project and any other supporting pump stations or balance tank requirements. Details should include:

- Design parameters for aspects of the Project that may impact on the endangered and threatened species.
- A program covering activities relating to design, construction, commissioning and first operating activities.

3.1 Water Pipeline

A detailed description of the pipeline project should be provided including:

- A map of the preferred route location using cadastral and topographical maps.
- Results of consultation with the Department of Main Roads during the alignment selection process aimed at minimising impacts on road safety and efficient traffic flow and realignments of any telecommunications or other infrastructure can be minimised.
- 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.
- Detailed criteria for pipeline burial depth and aboveground construction, along with pipeline orientation/location within any State-controlled road reserve.
- 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 the crossings proposed for the Brisbane, Bremer, Logan, Albert, Pimpama and Coomera Rivers, taking into account Q100 flood events. Describe whether the proposed pipeline route intersects any areas below the Highest Astronomical Tide line.
- For the proposed pipeline route describe, 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 Project 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 natures 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.

- An assessment of expected physical and chemical properties and quantities of soil/rock to be excavated
- Disposal/reuse of surplus excavated material and if this material can be coordinated with concurrent construction activities in the vicinity
- 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
- Pipeline construction techniques including:
 - 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
 - Extent that service corridors will be used during construction and maintenance
 - Width of vegetation clearing required. This information should indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas and creek crossings), and should also reference where in the EIS the impacts on such vegetation have been addressed
 - Management of soil during construction, particularly in the South-West Fire Ant Restricted Area
 - 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
 - Procedures for trench construction and pipe-laying if rock is encountered
 - 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 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.
 - Management of air emissions, particularly dust, during construction
 - Disposal of plant-matter left after clearing vegetation
 - Details of the anticipated hydrostatic testing procedures (discussion of water usage for this activity should be addresses 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

- The limit of the Environmental Protection Agency-defined Coastal Management District (CMD) should be clearly indicated on the plans showing the pipeline location.
- Pipeline operation and maintenance – inspection and surveillance activities and frequency, including the impact on waterways as a result of operation and maintenance activities, safety procedures (including provision of shut-down and/or venting in event of an emergency); provision for public safety in such circumstances
- Decommissioning methodologies, clean up and rehabilitation

3.2 Pump Stations

This section should provide a description and layout of the pump stations, including:

- Map showing location of any such facilities
- On-site plans, layouts, boundaries and elevations
- Detailed concept and staging (if any proposed) for additional pump stations facilities and locations
- Any land acquisition required
- Operational and management arrangements, including the administration and control of the facility
- Options considered in determining the design of the facilities and reasons for the preferred option
- Description of site preparation and construction activities, including:
 - Timing, staging and hours of construction work
 - Proposed construction methods, equipment to be used, and method of transport of equipment and materials to the site
 - Earthworks required
- Chemicals and hazardous goods to be utilized
- Public safety and emergency procedures
- Allowance for provision of power back-up in emergency and potential impact on local supplies in the area
- Ensure appropriate sound-proofing allowed
- Security of facility to be addressed
- Chemical and hazardous goods to be utilized and staff safety requirements, including ventilation.

3.3 Balance Tanks

This section should provide a description and layout of the balance tanks, including:

- Map showing location of any such facilities
- On-site plans, layouts, boundaries and elevations

- Detailed concept and staging (if any proposed) for additional pump stations facilities and locations
- Any land acquisition required
- Operational and management arrangements, including the administration and control of the facility
- Options considered in determining the design of the facilities and reasons for the preferred option
- Description of site preparation and construction activities, including:
 - Timing, staging and hours of construction work
 - Proposed construction methods, equipment to be used, and method of transport of equipment and materials to the site
 - Earthworks required

- Chemicals and hazardous goods to be utilized
- Public safety and emergency procedures
- Chemical and hazardous goods to be utilised and staff safety requirements
- Security of facility to be addressed.

3.4 Workforce and Accommodation

This section should provide details on the employment requirements and skills base of the required workforce for both the construction and operations phases of the project for the entire pipeline system. The report should also describe the deployment strategies proposed for the workforce over the construction period and the length of the pipeline. Information should be provided on the accommodation requirements for the workforce, (if any), and if applicable their family members.

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

- Food preparation and storage
- Ablution facilities
- Vector and Vermin control
- Fire safety
- Indoor air quality, and
- Dust and noise control in relation to proximity of camp site to the construction area

Outline local government approvals required for establishment and operation of such camps.

3.5 Gas Supply

This section should provide information on gas usage (if any) by the Project, including the source and quality of all gas to be used.

3.6 Water Supply/Storage

This section should provide information on water usage by the Project.

In relation to the water to be transported, the EIS should address the quality and quantity; the supply source(s); security of supply; and resource availability.

Options for the source of water for hydrostatic testing, and any other construction and/or operational water use, should be discussed. Detailed plans for any storage, reuse and disposal of water used for hydrostatic testing should be outlined.

Determination of potable water demand for the Project during the construction period should be made. Details should be provided of any existing town water supply to be used to meet such requirements. If water storage and/or treatment is proposed on site, for use by the site workforce, then this should be described. This description should include the management practices to maintain the quality of the water, including the source of the water, transportation, water treatment processes, microbiological and chemical testing program.

3.7 Electricity and Telecommunications

This section should identify the extent of electricity supply requirements and energy Conservation measures proposed.

Telecommunications requirements should also be noted.

3.8 Transport

This section should provide a brief over view of transport requirements. Full details of transport volumes, modes and routes should be provided under Section 4.10 Traffic, Transport and Access Arrangement.

3.9 Waste

This section should provide a brief overview of the waste management requirements of the Project. Full details of the waste volumes, characteristics and management strategies should be provided in Section 4.9 Waste.

4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

This section should address all elements of the environment, (such as land, water, nature conservation, cultural heritage, social and economic, air, noise, waste, transport and traffic and hazards and risk) in a way that is comprehensive and clear.

The EIS should assess the impacts of the construction, commissioning, operation and decommissioning stages (including rehabilitation) of the Project and any supporting compression requirements, together with impacts associated with potential ongoing maintenance, access and servicing resulting from the development and any other facilities required for the Project.

The functions of this section are to:

- Identify and describe existing environmental values of the area that may be affected by the proposal;
- Describe potential adverse and beneficial impacts of the proposal on the identified environmental values;
- Identify how the Project will be managed to protect environmental values and strategies to be applied to prevent or minimise harm to these values;
- Present environmental protection objectives and the standards and measurable indicators to be achieved; and

Deleted: Indentify

Environmental protection objectives may be derived from legislative and planning requirements which apply to the proposal including Commonwealth strategies, State planning policies, local authority strategic plans, environmental protection policies under the *Environmental Protection Act 1994*, any catchment management plans prepared by local water authorities or land care groups in support of the South East Queensland Region of Councils (SEQROC) 2021 Strategy and any threatened species recovery plans. Special attention should 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.

When determining environmental protection objectives, particularly in relation to estuarine creek and river crossings, the following documents and legislation should be considered: the State Coastal Management Plan 2001, the *Coastal Protection and Management Act 1995* and the *Coastal Protection and Management Regulation 2003*.

It is recommended that the EIS follow the heading structure shown below. The mitigation measures, monitoring programs etc, identified in this section of the EIS should be used to develop the Environmental Management Plans for the Project (see Section 5).

4.1 Land

This section should detail the existing land environment for all areas associated with the Project, including areas affected by the pipeline route, and any new permanent or temporary facilities constructed for the pipeline.

This section should also describe the potential for the construction and operation of the Project to change existing and potential land uses of the Project sites and adjacent areas.

4.1.1 Land Use and Infrastructure

4.1.1.1 *Description of Environmental Values*

The EIS should identify, with the aid of maps:

- Land tenure (including reserves, tenure of special interest such as protected areas and forest reserves, identification of both existing roads and road reserves and any corridors preserved by the Department of Main Roads for future transport needs or identified in the SEQ Regional Plan and accompanying SEQ Infrastructure Plan and Program, railways and rail reserves).
- Land use (urban, residential, industrial, agricultural, forestry, recreational, mining including mining and petroleum exploration tenures, mining leases, mining claims, mineral development licences and extractive industry permits).
- Areas covered by applications for Native Title determination or Native Title determinations (including traditional and contemporary uses of land and water by Aboriginal people and Torres Strait islanders). Provide description of Representative Bodies (NTRB) boundaries.
- Information on any known occurrences of economic mineralisation and extractive resources within the Project area.
- Distance of facilities and pipelines from residential and recreational areas.
- The locations of gas and water pipelines, power lines, roads, rail and any other easements
- The location of fences and gates to be crossed by the pipeline or constructed for pipeline access.

4.1.1.2 *Potential Impact and Mitigation Measures*

- Identify any land units requiring specific management measures
- Assess the compatibility of the proposal with surrounding land uses (e.g. mining)
- Describe possible impacts on surrounding land uses and human activities, including impacts to Good Quality Agricultural land 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.
- Indicate measures to be taken to minimise impact on Good Quality Agricultural land
- Describe strategy and progress in relation to making of Native Title agreements, including NTRB's, consultant selection, traditional owner involvement and related statutory processes.
- Comment on the suitability of the pipeline route for co-location of other infrastructure services, and/or the separation requirements with specific reference to transport corridors in the SEQ Regional Infrastructure Plan, and within individual impacted council boundaries.
- Identify how easement widths and vegetation clearance in sensitive environmental areas have been minimised.

- Consider 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.
- Comment on the possible alignment of the pipeline route with the proposed Southern Infrastructure Corridor which is intended to include a road and rail link from Ebenezer to the interstate rail line with the road link continuing on to the north of the Gold Coast region to service expanding industrial areas and population growth. The first stage of defining the corridor options from Ebenezer to the interstate rail line was completed by the Office of Urban Management in 2005 and more detailed investigations of this link will occur in the near future. Issues to be examined could include interconnections with future water supply sources to the south of the proposed pipeline corridor, bulk water distribution to the Gold Coast, and servicing the demand from population growth areas within the Mt Lindesay/North Beaudesert Study Area.
- Outline 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.
- Include the specification of all 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 pipeline and associated infrastructure.
- Identify if Millable Timber or Quarry resources exist on the pipeline route and conduct an assessment of the commercial value of these resources satisfying the requirements of the DPI&F
- The location of any proposed construction workers' accommodation or camps along the route of the pipeline should be identified in maps.

4.1.2 Topography/geomorphology

4.1.2.1 *Description of Environmental Values*

Maps should be provided locating the Project and its environs in both regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD). Significant features of the landscape should be included on the maps. Commentary on the maps should be provided highlighting the significant topographical features.

In coastal areas, where acid sulphate sulphate soils may be disturbed, and for major watercourse crossings, surrounding topography should be detailed at 1 m increments with levels shown with respect to AHD.

4.1.2.2 *Potential Impacts and Mitigation Measures*

- Discuss the Project in the context of major topographic features and any measures taken to avoid or minimise impact to such (if required).
- The objectives to be used for the Project in re-contouring and landscaping should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

4.1.3 Soils

4.1.3.1 Description of Environmental Values

Soils along the Project route should be described and mapped at a suitable scale, with particular reference to the physical and chemical properties of the soils which will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land, for example for dryland cropping, irrigated cropping or grazing uses. Information should also be provided on soil stability and suitability for construction of all Project facilities.

Soils should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (Gunn et al 1988 and McDonald et al 1990) using the Australian Soil Classification (Isbell, 1996) . An appraisal of the depth and quality of useable soils should be undertaken. The location of each borehole should be accurately presented on maps, and boreholes should equitably represent different soil types present. Information should be presented according to the standards required in the Planning Guidelines: The Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993) that supports State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

Discuss the potential:

- For the existence of acid sulphate soils within the disturbance zone of the pipeline
- For the existence of Good Quality Agriculture Land along and adjacent to the proposed pipeline route including alternative routes as outlined in Section 2.3
- For land contamination from existing and past uses based on land use history and the nature and quantity of any contaminants. A preliminary site investigation should be prepared including a search of Contaminated Land Register and Environmental Management Register.

4.1.3.2 Potential Impacts and Mitigation Measures

This section should provide details on any potential impacts on soils, including:

- Measures to ensure that soil erosion does not accelerate along the pipeline route due to construction or maintenance activities

- Influence of time of year of construction on the impact on soils
- Management measures for acid sulphate soils that may be encountered in association with the Project should be consistent with that support State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulphate Soils Version 2 (DLGP and DNRM, August 2002) and Soil Management Guidelines Version 3.8, DNRM November 2002 (Dear et al, 2002)
- Management of any contaminated land and potential for contamination from construction, commissioning and operation
- Details of erosion control measures and criteria used to assess methods that will minimise/alleviate sedimentation over various terrain types including waterway beds, banks and adjacent areas. Methods of stockpiling and disposal of trench material from excavated streambed, bank, and adjacent areas should be included
- Pipeline route adjustments and/or rehabilitation measures to minimise impacts on Good Quality Agricultural Land.

A description of topsoil management should consider transport, storage and replacement of topsoils to disturbed areas. The minimization of topsoils storage times (to reduce fertility degradation) should also be addressed. Erosion and sediment control should be described with a Soils Erosion and Sediment Control Plan included in the EMP.

4.1.4 Contaminated Land Matters

A review should be undertaken to identify the property descriptions that are listed on the Environmental Management Register (EMR) or contaminated Land Register (CLR) that will be affected by the proposed pipeline.

A Strategy for managing potential contamination on those properties, which are listed on the EMR/CLR, should be developed and submitted to the Environmental Protection Agency's Contaminated Land Unit, prior to commencement of the project.

4.2 Climate

This section should describe climatic conditions in the Project area in relation to their bearing on the design of Project facilities, construction methods and operational parameters.

Discuss seasonal conditions (e.g. cyclones, thunderstorms, floods and storms) that may influence timing and/or construction methods and how this will be managed.

Discuss how weather will be monitored to minimise the risk of adverse impacts to the Project area during the construction period.

4.3 Water Resources

4.3.1 Description of Environmental Values

This section describes the existing environment for water resources that may be affected by the proposal in the context of the environmental values as defined in such documents referred to in the *Environmental Protection Act 1999* and the *Environmental Protection (Water) Policy 1997*. If 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 should provide sufficient information for a decision to be made on this application.

- Existing surface and ground water in terms of physical, chemical and biological characteristics
- Environmental values of the surface waterways of the affected area in terms of:
 - Values identified in the *Environmental Protection (Water) Policy*
 - Sustainability, including both quality and quantity
 - Physical integrity, fluvial processes and morphology of water courses, including riparian zone vegetation and form
- Existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses
- The watercourses to be crossed by the pipeline showing planned crossing locations on a map. Discuss consideration of alternative crossing locations in environmentally sensitive areas.

4.3.2 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. Matters to be addressed should include:

- Likely impacts associated with the construction and operation of water courses, particularly with respect to erosion and scouring, and selection criteria for determining the final crossing type for various stream orders to protect watercourse integrity
- Potential impacts on flooding levels upstream of any new crossing of water courses
- Amelioration or mitigation measures to address each impact identified that may affect local and regional water quality, particularly measures to ensure beds and banks of water courses remain stable and measures to safeguard downstream water quality.
- Possible sources of water pollution or other changes in water quality including soil erosion, siltation, accidental spills, waste and sewage disposal and likely chemical composition of any leachate from introduced fill on the site
- The quality of water leaving construction sites (including physical, chemical, and biological characteristics), potential impacts for any likely discharged water (e.g. hydrotest water) and how the impacts will be assessed

- The 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 watertable and secondary influence on flooding. If levee banks or downstream diversionary constructions are proposed, the effects on neighbouring landholders should be considered, and any works requiring permits or licensing in accordance with the *Water Act 2000* identified.
- Discussion of the proposed drainage structures for all aspects of the proposal including facilities such as access roads.
- Discussion of the timing of the construction works relative to likely periods of flooding and proposals to minimise the risk of adversely impacting downstream water quality.
- Discussion of measures to ensure viable weed seeds are not released into the water environment including from machinery traversing creek systems or riparian areas.

4.4 Nature Conservation

This section should detail the existing nature conservation values of the Project area.

The flora and fauna communities should be described, in particular those that are rare or threatened, in environmentally sensitive localities, including waterways, riparian zones, and wilderness and habitat corridors. The description should include species lists.

Reference should be made to relevant State and Commonwealth legislation and policies on threatened species and ecological communities including recovery plans.

All surveys undertaken should be in accordance with best practice advice from the EPA and should include consideration of seasonality, potential for occurrence of significant species, rarity of species and the sensitivity of the species to disturbance.

This section should also discuss all likely direct and indirect environmental harm on flora and fauna in both terrestrial and aquatic environments in sensitive areas.

The EIS should demonstrate how the project (including the proposed pipeline route and other areas of disturbance such as access tracks) would comply with the following hierarchy:

1. Avoiding impact on areas of remnant flora and fauna communities and other areas of conservation value
2. Mitigation of impacts through rehabilitation and restoration
3. Measures to be taken to replace or offset the loss of conservation values where avoidance and mitigation of impacts cannot be achieved
4. Explanation of why measures 1 to 3 above would not apply in areas where loss will occur

- Discuss the exact alignment where the proposed pipeline runs through or adjacent to (within 1 km of) an endangered ecological community, including details of footprint width. Discuss why the alignment is preferred and the viability of alternatives where the alignment will impact upon a threatened community. Discuss the amount of time that trenches are open and how the potential for fauna to be trapped in open trenches is reduced.

4.4.1 Sensitive Environmental Areas

4.4.1.1 Description of Environmental Values

The EIS should identify areas that are environmentally sensitive in proximity to the Project. Environmentally sensitive areas should also be classified as having State, Regional or Local Biodiversity Significance or flagged as important for their integrated biodiversity values.

In addition the EPBC Act should be addressed with regard to matters of national environmental significance identified by the Commonwealth when the Project was deemed to be a 'controlled action' e.g. listed threatened species and communities – particularly but not exclusively wet heathland, eucalypt and melaleuca woodland, and riparian vegetation, if necessary.

The proximity of the Project elements to any of these areas should be identified and mapped.

Areas which would be regarded as sensitive with regard to flora and fauna have one or more of the following features:

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

4.4.1.2 Potential Impacts and Mitigation Measures

- Discuss the impact of the proposal on species, communities and habitats of local, regional or national significance as identified above including wet heathland,

eucalypt and melaleuca woodland, and riparian vegetation. Discuss ways in which impacts can be minimised (e.g. timing of works, minimise width of disturbance, proposed rehabilitation of instream and floodplain disturbances).

- Discuss the planned rehabilitation of wet heathland, eucalypt and melaleuca woodland, and riparian vegetation communities and any relevant previous experience/experiments rehabilitating these communities.

4.4.2 Terrestrial Flora

4.4.2.1 Description of Environmental Values

Terrestrial vegetation maps at a suitable scale (e.g. 1:100,000 generally or 1:50,000 for appropriate detail locations) should be provided for the entire Project area. Mapping should be produced from aerial photos and ground truthing and should show and discuss:

- Location and extent of vegetation types using the EPA's regional ecosystem descriptions in accordance with the Conservation Status of Queensland's Bioregional Ecosystems. (Sattler P.S. & Williams R.D. (Eds) 1999) and the EPA's website (www.epa.qld.gov.au/environment/science/wildlife/) listing the biodiversity status of regional ecosystems.
- Location of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments, and listed as threatened under the EPBC Act 1999.
- Any plant communities of cultural, commercial or recreational significance should be identified.
- Vegetation map unit descriptions should also discuss their relationship to regional ecosystems. Sensitive or important vegetation types should be highlighted and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types discussed.

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 assessment should also include the significance of native vegetation (including regrowth and restored areas in addition to remnant vegetation), from a local, regional, State and National perspective.

For each significant natural vegetation community likely to be impacted by the Project, undertake vegetation surveys at a sufficient number of sites, allowing for seasonal factors, as follows:

- All data requirements of the Queensland Herbarium CORVEG database should be collected
- The minimum size site should be 500 square metres
- A complete list of species present at each site should be recorded
- The relative abundance of plant species should be recorded

- Any plant species of conservation, cultural, commercial or recreational significance should be identified. The existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range habitat, breeding, recruitment feeding and movement requirements, and current level of protection (e.g. any requirement of Protected Area Management Plans or recovery plans) should be identified.
- Vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database
- 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.

The existence of rare or threatened species should be specifically addressed under sensitive areas, and the location of any horticultural crops in the vicinity of the Project facilities should be shown.

Details of any riparian vegetation and native grasslands, and their value for fauna habitat and conservation of specific rare floral and faunal assemblages or community types, from both a local and regional perspective, should be provided. Any special landscape values of any natural vegetation communities should be described.

Existing information on plant species may be used instead of new survey work provided that the data are derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the report. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value. The occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Land and Stock Route Management) Act 2002* should be shown on a map at an appropriate scale. A weed management strategy will be required to include the provision of surveys for pest plants to occur after significant rainfall events that will allow germination.

4.4.2.2 Potential Impacts and Mitigation Measures

- Discuss the ability of identified stands of vegetation to withstand any increased pressure resulting from the proposal and identify measures proposed to mitigate impacts
- Describe the methods to ensure rapid rehabilitation of disturbed areas following construction including the species chosen for revegetation which should be consistent with the surrounding associations. Include details of any post construction monitoring programs and what benchmarks will be used for review of monitoring
- Describe methods of minimizing the potential for the introduction and/or spread of weeds or plant disease, including:
 - Identification of the origin of construction materials, machinery and equipment

- The need for vehicle and machinery washdown and any other hygiene protocols
- Staff/operator education programs
- Include a weed management plan in the EMP, to be developed in consultation with local government environmental officers, to cover construction, commissioning, rehabilitation and operation periods

4.4.3 Terrestrial Fauna

4.4.3.1 Description of Environmental Values

The terrestrial and riparian fauna occurring in the areas affected by the Project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. Wildlife corridors and refugia along the proposed route should be identified and mapped.

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

- Species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats
- Any species which are poorly known but suspected of being rare or threatened
- Habitat requirements and sensitivity to changes including movement corridors and barriers to movement
- The existence of feral or exotic animals
- Existence of any rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans or recovery plans).

The EIS should contain results from surveys for species listed as threatened or migratory under the EPBC Act. Surveys are to be conducted at the appropriate time of the year when the species is known to be present on this site, so that identification and location of these species is optimal.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the subregion where Project sites occur. The methodology for subregional analysis of representatives and adequacy of protection for the terrestrial/riparian vegetation communities and the flora and fauna taxa that inhabit them within the affected areas should be clarified.

Site data should be recorded in a format compatible with EPA WildNet databases.

The following issues should be addressed when assessing the potential impacts on matters of National Environmental Significance.

Impact on a listed threatened species or ecological community:

Potential impacts vary depending on whether the species or ecological community is extinct in the wild, endangered or vulnerable but are generally as follows:

- lead to long-term decrease in the size of a population or a long-term adverse affect on an ecological community,
- reduce the area of occupancy of the species or extent of occurrence of the ecological community,
- fragment an existing population or ecological community,
- adversely affect habitat critical to the survival of the species or ecological community,
- disrupt the breeding cycle of a population,
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,
- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the ecological community's survival,
- result in invasive species that are harmful to the species or ecological community becoming established,
- interfere with the recovery of the species or ecological community, or
- consistency with any recovery plan.

Impact on a listed migratory species:

- loss or modification of habitat important for migratory species (including fragmentation, altered land use, fire regimes, altered nutrient cycle etc),
- introduction of invasive species, and
- disruption to lifecycle (breeding, feeding, migration, roosting, etc.).

4.4.3.2 Potential Impacts and Mitigation Measures

- Identify any impact the proposal may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values
- Discuss measures to minimise wildlife capture and mortality
- Provide details of the methodology that will be used to assess and handle injuries that may be inflicted on livestock or native fauna as a result of operational works for the Project
- Discuss the method of minimizing the introduction of feral animals, and other exotic fauna
- Discuss the effects of construction activities and disposal of construction wastes on biting insect species of pest and health significance, including measures to prevent increases and the spread of these species. Management of spoil in the South Western Fire Ant Declared Area must be specifically addressed.

4.4.4 Aquatic Biology

4.4.4.1 *Description of Environmental Values*

The aquatic flora and fauna occurring in the areas affected by the Project should be described noting the patterns and distribution in the waterways.

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 Project areas should be described.

The discussion of the fauna and flora present or likely to be present at any time during the year should include:

- Fish species, mammals, reptiles, amphibians, and aquatic invertebrates occurring in the waterways within the Project area
- Aquatic (waterway) plants
- Aquatic substrate and stream type

4.4.4.2 *Potential Impacts and Measures*

- Discuss the potential for and mitigation measures to prevent the creation of new mosquito and biting midge breeding sites during construction (e.g. in quarries and borrow pits)
- Discuss any proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that will restrict free movement of fish. Also include if seasonal construction of waterway crossings can avoid fish spawning periods
- Identify necessary permits/authorities required by the Project (e.g. permits are required under the *Fisheries Act 1994* to construct waterway barriers, temporary or permanent)

4.5 **Historic and Cultural Heritage**

4.5.1 **Description of Environmental Values**

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

A cultural heritage study will be required which will describe indigenous and non-indigenous cultural heritage sites and places, and their values, and include:

- Consultation with:
 - The Australian Heritage Places Inventory
 - The Environmental Protection Agency regarding the Queensland Heritage Register and other information regarding places of potential non-indigenous cultural heritage significance
 - The Department of Natural Resources and Mines regarding the Indigenous Site Database

- Any local Government heritage register
- Any existing literature relating to the affected areas
- Liaison with representatives of relevant indigenous community/communities concerning:
 - Places of significance (including archaeological sites, natural sites, story sites etc), and appropriate involvement in field surveys
 - Any requirements by communities and/or informants relating to selection of consultants and confidentiality of site data. Non-indigenous communities may also have relevant information
 - Significance assessment of any cultural heritage sites/places located
- Liaison with relevant community groups/organizations (e.g. local historical societies) concerning:
 - Places on Non-Indigenous cultural heritage significance
 - Opinion regarding significance of any cultural heritage places located or identified
- Identifying locations of culturally significant sites likely to be impacted by pipeline construction, including:
 - Stone artefact scatters
 - Culturally significant vegetation
 - Buildings or places of archaeological significance
 - Archaeological sites, natural sites, story sites etc
- When examining tenure, the location of historical mining areas should be shown on maps. This may be used to identify former mining zones or historical workings where slumping or other problems might occur in the future
- A report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due regard for any confidentiality requirements specified by community representatives)

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

4.5.2 Potential Impacts and Mitigation Measures

Every attempt should be made to identify a pipeline route that avoids any significant heritage areas. The Proponent should provide an assessment of any likely effects on sites of European or Indigenous cultural heritage values, including but not limited to the following:

- Describing the significance of artefacts, items or places of conservation or cultural heritage value likely to be affected by the proposal and their values at a local, regional and national level
- Recommended means of mitigating any negative impacts on cultural heritage values and enhancing any positive impacts

The management of cultural heritage impacts should be detailed in a Cultural Heritage Management Plan (CHMP) that is developed specifically for the proposed Project. The CHMP should provide a process for the management of identified cultural heritage places and values within the proposed pipeline route. In particular, Part 7 of the *Queensland Heritage Act 1992* makes provision for historical heritage studies and the management of accidentally found historical material.

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

- A process for including indigenous communities associated with the proposed pipeline route in protection and management of Indigenous cultural heritage
- Processes for mitigation, management and protection of identified cultural heritage places and material along the pipeline route, including associated infrastructure developments, both during the construction and operational phases of the Project
- Provisions for the management of the accidental discovery of cultural material including burials
- A conflict resolution process

The development of the CHMP should be negotiated with all relevant stakeholder representatives, subject to any confidentiality specified by indigenous communities and registered Native Title applicants.

As a minimum, impact assessment, protection and management strategies should satisfy statutory responsibilities and duties of care, including those under the *Queensland Heritage Act 1992*, the *Aboriginal Cultural Heritage Act 2004* and the *Commonwealth Aboriginal and Torres Strait Heritage Protection Act 1984*.

4.6 Social and Economic Environment

This section should detail the existing social environment. Issues to be addressed include:

- Structure of potentially affected communities in the study area
- Community profile, providing information on the following characteristics
 - Rural properties, farms, croplands and grazing areas
 - Demography and family structure
 - Health status and sensitive groups

- Workforce characteristics, including types of skill or occupations and availability during both construction and operational stages
 - Accommodation type, quantity availability (as it relates to the need for accommodation of the Project construction and operational work force – if any)
 - Public health and education facilities
 - Local government and public services
 - Other community services and facilities
- Socio-demographic characteristics, including employment and unemployment rates
 - Aboriginal people's traditional and contemporary uses of the land affected by the Project
 - Economic base and economic activity

4.6.2 Potential Impacts and Measures

The social and community impacts of the proposed development should be addressed as part of the EIS incorporating any assessment of stakeholders' concerns about adverse impacts to the natural, social, economic or built environment so that appropriate mitigation strategies can be developed. Considerations should be given to the following:

- The impact of the Project on existing agricultural and grazing land uses – e.g. disruption to stock, fences, water points, sowing or harvesting of crops, movement of agricultural machinery and any loss of agricultural land
- The impact on affected landowners and communities – e.g. impact on property values and local authority rates
- Restrictions to public access and recreational use during construction, commissioning and operational phases, and after decommissioning
- Strategies to minimise access requirements for operation and maintenance activities
- The potential and mechanisms for local communities and business to meet contracts for services and supplies for the construction, rehabilitation and operation phases of the Project
- Strategies for local residents including members of indigenous communities interested in employment opportunities, which would identify skills required for the Project and initiate appropriate recruitment and training programs
- Describe the impact of the Project on public health and safety of adjacent communities, including such impacts as noise, dust, waste, transport, and other hazards particularly for closely settled communities such as Mt Crosby, Ipswich, Springfield, Munruben and Beenleigh.
- Discuss the impact of accommodation requirements (if any) during construction and operation stages, on communities along the pipeline route
- Any impacts (positive or negative) on the local and regional housing construction sector should be identified, with regard to the supply of dwellings for the construction workforce

- Impact of the Project workforce on local human services (e.g. housing, education and health facilities) and local community social and recreational environments
- Strategies responding to Government Policy relating to:
 - The level of training provided for construction contracts on Queensland Government building and construction contracts. (The State Government Building and Construction Contracts Structured Training Policy (the 10% Policy))
 - Indigenous employment opportunities. (Indigenous Employment Policy for Queensland government building and Civil Construction projects (the 20% Policy))
 - The use of locally sourced goods and services (making use of DSDI Local Industry Policy)
- Strategies to foster cross-cultural awareness for the Project and its Participants
- Direct and indirect impact of the Project on the regional, state and national economies in terms of direct and indirect effects on employment, income and production

4.7 Air Environment

4.7.1 Description of Environmental Values

This section should describe the existing air environment, which may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection (Air) Policy*.

4.7.2 Potential Impacts and Mitigation Measures

The following air quality issues should be considered:

- Impacts of dust generation from construction activities, especially in areas where the pipeline follows existing road networks or passes in close proximity to residences
- Identification of climatic patterns that could affect dust generation and movement
- Predicted changes to air quality from vehicle emissions and dust generation along haulage route
- Impacts on air quality from gaseous emissions including carbon monoxide (CO) oxides of nitrogen (NO_x) from pump stations (if any), greenhouse gas emissions and ozone depleting substances
- Amelioration or mitigation measures for each identified impact relating to vehicle emission, dust generation and gaseous emissions should be proposed

4.8 Noise and Vibration

4.8.1 Description of Environmental Values

Sensitive noise receptors adjacent to the pipeline route, pump stations and balance tanks should be mapped and typical background noise levels discussed. The potential sensitivity of such receptors should be discussed and performance indicators and standards should be nominated for each affected receptor. Current background levels for noise should be surveyed or reported.

4.8.2 Potential Impacts and Mitigation Measures

The following analysis of noise impacts should be assembled:

- The levels of noise generated during construction of the pipeline, pump stations and balance tanks and ancillary activities (e.g. access roads, camp sites) and operations against current typical background levels
- The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any places of work, residence, recreation, or worship, should be quantified and compared with objectives, standards to be achieved and measurable indicators
- This should also include environmental harm on terrestrial animals
- Proposals to minimise or eliminate these effects should be provided, including details of any screening, lining, enclosing or bundling of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise
- Assessment should be made of the potential emission of low-frequency noise (i.e. noise with components below 200 Hz) from major items or plant or equipment and, if necessary, measures should be described for reducing the intensity of these components.

4.9 Waste

4.9.1 Waste Generation

Identify and describe all sources of waste associated with construction, commissioning, operation and decommissioning of the pipeline. Describe all activities including:

- Chemical and mechanical processes conducted on the construction sites/camps (e.g. chemical storage, sewage treatment, power generation, fuel burning, mechanical workshop, diesel storage)
- The amount and characteristics of solid and liquid waste produced on-site (compression facilities, pipeline, construction camps) by the Project
- Any waste treatment process involved, including site drainage and erosion controls
- Selection criteria, and show on the map likely run-off/stormwater discharge points
- Selection criteria, and show on the map the disposal point for hydro-test water
- Hazardous materials to be stored and/or used on-site, provide their Material Safety Data Sheets and environmental toxicity data and biodegradability.

Descriptions should also include (using maps and plans as appropriate):

- Generation points
- Storage methods and facilities
- Quantities
- Disposal arrangements
- Recycling/reuse arrangements

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

- Volume estimates of industrial and domestic effluent that will be produced at each Project site
- Quality of effluent produced
- Any mobile sewerage facilities to be used
- The proposed method of disposal and extent of use of local government facilities (i.e. Council Sewerage works)
- Potential impacts to any aquifers, underground water flows and surface waters to be traversed by construction of the pipeline should be discussed in Section 4.3.2

4.9.2 Waste Management

Waste management strategies should incorporate measures to avoid waste generation where possible. Discuss waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste, including measures to minimise attraction of vermin, insect and pests.

4.10 Traffic, Transport and Access Arrangements

4.10.1 Transport Methods and Routes

With the use of maps and data tables discuss transport methods and routes for delivering pump station and balance tank equipment, pipeline construction and maintenance materials, other necessary goods and consumables and workforce transportation. Information should include:

- Volumes, tonnage, and composition of construction inputs
- Hazardous or dangerous material that may be transported
- Method of transport (e.g. sea, rail, road) and the type of vehicles most likely to be used for transport
- Number and type of workforce traffic and service vehicles
- Number of trips generated (both light and heavy vehicles)
- Origin and destination of inputs and transport route proposed (with the use of maps). Existing traffic volumes will need to be shown
- Details of over-dimension, excess mass loads or any hazardous goods

- Timing and duration of transport

Overall, it is important that the EIS clearly and fully describes transport information for all stage of the Project including:

- Any new access requirements to State-controlled or local government roads or corridors preserved by the Department of Main Roads or corridors set out in the SEQ Regional Plan and Program
- Full details of where the pipe alignment crosses or runs close to road and rail reserves

The EIS should provide sufficient details to allow Main Roads and Queensland Transport to ascertain compliance with legislative and design requirements to ensure the safe and efficient operation of State-controlled roads is not compromised and the integrity of preserved transport corridors is protected.

4.10.2 Potential Transport Impacts and Mitigation Measures

It is anticipated that the pipeline route will mostly traverse rural areas. However the pipeline will need to pass through rural and urban residential uses at Mt Crosby, Ipswich, Springfield, Munruben and Beenleigh south. The Project will need to examine potential impacts to traffic flow for the entire alignment on all residences and businesses included along the pipeline route.

Assessment of impacts for the entire alignment should discuss the following:

- The likely impacts and mitigation strategies of increased traffic on local and regional road networks (with appropriate directional distributions) with reference to:
 - Traffic volume
 - Vehicle size and types, including heavy vehicle access
 - Usage rates
 - Road safety issues, including safe access to construction sites (e.g. consideration of the need for turning lanes, improved sight lines, waiting areas, off-road parking locations)
 - Reduced efficiency of traffic flows or intersections along key routes, especially during construction
 - Additional wear/reduced life of pavements requiring additional or accelerated rehabilitation and maintenance if any
 - Social, amenity, environmental or cultural heritage impacts of transport not covered in other sections
- The proposed traffic management arrangements and plans, especially within both rural and urban residential areas and steps to be taken to prevent public access to construction access ways not provided on public roads

- Specific issues related to construction phase activities:
 - Site depot location and access
 - Construction traffic on local road networks, daily movement patterns and emergency access, especially in rural and urban residential areas
 - Methods to be adopted to avoid obstruction to other road uses during construction
- The likely impact of increased traffic on rail haulage systems
- Environmental issues relating to transport (e.g. weed management, vegetation clearing in road reserves, dust control and erosion protection) are adequately assessed and ways to ameliorate any adverse impacts are outlined.
- The impacts of construction with regard to seasonal considerations such as potential for road impacts during wet weather

Findings of studies and assessments should be incorporated into a road management strategy including Transport and Traffic Management Plans

Reference should be made to any relationship between Project road works and works proposed in the current Road Implementation Program(s) of the Department of Main Roads (DMR). Road infrastructure impacts should be described and assessed according to DMR's *Guidelines for Assessment of Road Impacts of Development Projects (Nov 2000)*. Reference should also be made to other Main Roads planning documents where applicable.

It is anticipated that there will be an increase in haulage vehicles transporting sections of pipe via the main service routes. Furthermore, local traffic along shire roads adjacent to the proposed route will increase substantially as a result of construction activity. The Project will need to advise Councils if and when significant increases in vehicle use on minor roads is expected, and discuss rehabilitation strategies.

4.11 Hazard and Risk

4.11.1 Risk Assessment

- The Proponent shall carry out suitable Risk Assessments
- While the EIS must deal with on-site risks, it is suggested that external risks to the Project also be considered. It is suggested that external risks from natural hazards be determined on the basis of AS/NZS Risk Management Standard 4360:1999.
- The study shall assess risks during the construction, commissioning, operational and decommissioning phases of the pipeline. Where possible these risks are to be assessed in quantitative terms
- Indicate possible hazards, accidents, and abnormal events that may arise for the Project, during construction, commissioning and operation. This would be expected to include accidental release of water or other materials, and explosions and fires associated with incidents arising from the pump stations, or catastrophic

failure of the balance tanks. It may include seismic stability of the pipeline route and the vulnerability of the route to flooding, bushfire and landslip.

- Analysis shall be conducted of the consequences of each of these events on safety and environmental damage in the Project area, particularly in the vicinity of the pipeline and associated facilities. Safety may include both injuries and death to workers and to the public. Environmental damage includes only direct harm to the environment as a result of pipeline hazards
- The analysis shall examine the likelihood of these consequences being experienced, both individually and collectively
- As far as possible quantitative levels of risk and risk contours shall be presented from the above analysis
- Details are to be provided of the safeguards which will be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites along the pipeline route. Where possible indicate the reduced level of risk which would be experienced with these safeguards in place
- Compare assessed and mitigated risks with acceptable risk criteria for land uses adjacent to the pipeline route locations
- A detailed description of risk management procedures in relation to road users in case of catastrophic failure of any element of project infrastructure such as pipeline or pump station should be provided.
- Should the pipeline or any associated infrastructure be situated above ground in road reserves, provision for the protection and reasonable restoration of the visual amenity of the locale prior to the pipeline implementation should be provided.

4.11.2 Emergency Management Plan

An outline of the proposed emergency management procedures is to be provided for the range of situations identified in the above risk assessment as providing measurable risks.

The following should also be presented:

- Contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) oil spills during construction, operation and maintenance of the pipeline
- Contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and maintenance phases
- Emergency planning and response procedures that have been determined in consultation with State and regional emergency service providers
- Plans for involvement of the relevant State agencies (such as the Queensland Ambulance Service) in relation to emergency medical response and transport and first aid matters

5. ENVIRONMENTAL MANAGEMENT PLANS

Draft Environmental Management Plans (EMPs) should be presented in the EIS for construction, commissioning, and for operation, and should detail measures to address

impacts identified in this EIS for the respective phase of the Project. EMPs should contain the following:

- Environmental element – the environmental aspect requiring management consideration
- Potential impacts – as identified in the EIS
- Performance objective – the target or strategy to be achieved through management
- Management actions – the strategies and actions to be undertaken to achieve the performance objective, including any necessary approvals, applications, and consultation
- Performance indicators – criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured
- Monitoring – process of measuring actual performance
- Responsibility – assign responsibility for carrying out strategies and monitoring actions to relevant persons/organizations
- Reporting – the process and responsibility for reporting monitoring results
- Corrective action – the action to be implemented in the case of non-compliance and the person/organization responsible for action

6. CONCLUSION AND RECOMMENDATIONS

The EIS should make conclusions and recommendations with respect to the Project, based on the studies presented, the Environmental Plans and the conformity of the proposal with ESD policy.

7. REFERENCES AND APPENDICES

References should be consistent and in a recognized format. Items in the Appendices may include:

- Site plans
- Terms of Reference
- Study Team
- Statutory Permits and Development Approvals
- Research Reports and Specialist Studies.