

PAPUA NEW GUINEA TO QUEENSLAND GAS PIPELINE PROJECT – GOVE LATERAL

DRAFT GUIDELINES/TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT

**Under Part (4) of the Queensland *State Development and Public Works Organisation Act 1971*; and
the Northern Territory *Environmental Assessment Act 1982*; and
Chapter 4 of the Australian Government *Environment Protection and Biodiversity Conservation Act 1999***

April 2006

PREAMBLE

Project Background

The Papua New Guinea (PNG) to Queensland Gas Pipeline Project – Gove Lateral is being developed as part of the PNG Gas Project. The PNG Gas Project involves the production of gas from a number of fields in the Southern Highlands of PNG and transporting this by pipeline to gas markets in Australia.

The PNG Gas Project consists of upstream gas production and transportation facilities within PNG, as well as downstream gas transportation infrastructure within Australia. The PNG to Queensland Gas Pipeline Project comprises a pipeline from the PNG-Australia border in the Torres Strait to Gladstone in central Queensland, which was proposed in the late 1990's and is known as the "mainline", and two recently proposed lateral pipelines: to Ballera in southwest Queensland; and Gove in the Northern Territory.

In 1998, the Queensland and Australian Governments conducted a joint Impact Assessment Study under the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) and an Environmental Impact Statement (EIS) under the Australian Government *Environmental Protection (Impact of Proposals) Act 1974* for the gas pipeline from the PNG-Australia border in the Torres Strait to Gladstone, the mainline. However, development of the pipeline did not proceed at this time due conditions in the prevailing gas market. The project was revitalised in 2004, following a significant increase in demand in the Australian gas markets. The environmental approvals relating to the mainline are being managed by an Australian/Queensland Environmental Review Committee to ensure compliance with the commitments given in the studies and the recommendations from the 1998 Environmental Assessment Report.

On 24 February 2005, the AGL-Petronas Consortium (APC) announced the commencement of the front end engineering and design (FEED) program for the PNG to Queensland Gas Pipeline Project. It will include:

- Regulatory agreements / negotiation;
- Onshore land access / environmental approvals;
- Onshore pipeline engineering;
- Offshore pipeline engineering; and
- Project finance.

Subsequently, on 20 February 2006, APC lodged an Initial Advice Statement with the Queensland Coordinator-General for the Gove Lateral.

Project Proponents

The PNG Gas Project partners are ExxonMobil (Esso Highlands Limited), Oil Search Limited, Mineral Resource Development Corporation (a PNG company representing landowner interests), Nippon Oil Exploration and The Australian Gas Light Company (AGL).

The proponent for the PNG to Queensland Gas Pipeline project is APC, a consortium of subsidiary companies of The Australian Gas Light Company (AGL), and Petroleum Nasional Berhad (Petronas). AGL is an Australian energy company with interests in gas and electricity production, distribution and sales across the country. Petronas is a Malaysian state-owned energy company with international interests in oil and gas production and processing facilities, whose portfolio includes part ownership of gas pipelines through AGL's subsidiary Australian Pipeline Trust.

APC is the proponent for the PNG to Queensland Gas Pipeline Project – Gove Lateral (the “Project”), which is the subject of these Terms of Reference/Guidelines.

Project Summary

The proposed Project is for a 670km long gas pipeline from the proposed PNG-Queensland Gas Pipeline mainline near Weipa directly across the Gulf of Carpentaria to Gove in the Northern Territory. According to the proponent the pipeline is integral to the overall development of the PNG Gas project, as it will enable the first major flow of natural gas to Australia and is critical to the overall commercial viability of the project.

The project includes a proposed 30km gas supply pipeline from the Gove Lateral to Weipa, which will greatly enhance energy supply options in the region.

Subject to project approval, APC expects to commence construction of the Gove Lateral in early 2007 to enable first gas to be delivered in 2009.

Administrative Procedures for these Terms of Reference

The impact assessment process for the Gove Lateral involves three jurisdictions, the Australian (Commonwealth), Queensland and Northern Territory Governments. An agreement has been reached between the three jurisdictions regarding coordination of the EIS process. While the proponent must satisfy the individual approval requirements for the three separate jurisdictions, one set of documentation will be produced to meet the environmental assessment requirements of all three jurisdictions. The Australian Government Department of Environment and Heritage (DEH) will coordinate the assessment process.

On 6 March 2006 DEH determined that the Project is a ‘controlled action’ under the *Environment Protection and Biodiversity Act 1999* (EPBC Act) due to potential impacts to protected matters of national environmental significance (see Attachment 1). The controlling provisions under the EPBC Act are Sections 18 and 18A (listed threatened species and communities), Sections 23 and 24A (marine environment) and Sections 26 and 27A (Commonwealth Land). The Project will require approval from the Australian Government under Part 9 of the EPBC Act before it can proceed. The Australian Government on 3 April 2006 also directed, under Section 87 of the EPBC Act, that an EIS for the Project proposal be produced by APC.

On 7 March 2006 the PNG to Queensland Gas Pipeline Project – Gove Lateral was declared to be a ‘significant project’ by the Queensland Coordinator-General (CG) pursuant to Section 26(1)(a) of the SDPWO Act which requires APC to prepare an EIS under the provisions of this Act.

On 11 April 2006 the Northern Territory (NT) Minister for Natural Resources, the Environment and Heritage determined that the PNG to Queensland Gas Pipeline Project – Gove Lateral, be assessed under the *Environmental Assessment Act 1982* at the level of an EIS. The NT component of the project would require approval from the NT Government before construction of that section could proceed.

The term EIS refers to the primary document describing the proposed pipeline and its environmental impacts, as required under the relevant environmental impact assessment legislation assessment processes of the Australian, Queensland and Northern Territory Governments. These Guidelines/ToR should be interpreted as satisfying the requirements of all relevant Australian, State and Territory statutes for this Project (see Attachment 2).

Representatives of Australian, State, Territory and Local governments and other relevant authorities have been invited to act as advisory agencies for the EIS process and they have been requested to examine the Initial Advice Statement (IAS)/ Notice of Intent (NOI) and comment on the draft Guidelines/ToR. The IAS/NOI and draft Guidelines/ToR have also been placed on public exhibition. The DEH, the CG and the Northern Territory Environmental Protection Agency Program (NT EPA Program) will take account of all comments received on the Draft Guidelines/ToR in finalising the Guidelines/ToR, which will be issued to APC.

APC will prepare a draft EIS to address the Guidelines/ToR. Once the EIS has been prepared to the satisfaction of DEH, the CG and NT EPA Program, a public notice will be advertised in relevant newspapers circulating in the districts, State/Territory and nationally. 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 DEH, the CG and the NT EPA Program about the EIS; and the submission period. APC will be required to prepare a Supplementary Report to the EIS to address specific matters raised in submissions on the EIS.

Queensland Assessment

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 SDPWO Act. The CG Report will include an evaluation of the environmental effects of the proposed Project and any related matters. The Report will reach a conclusion about the environmental effects and any associated mitigation measures, taking into account all of the relevant material including: the EIS; all properly made submissions and other submissions accepted by the CG; and any other material the CG considers is relevant to the Project, such as the Supplementary Report to the EIS, comments and advice from Advisory Agencies, technical reports on specific components of the Project and legal advice.

The CG Report will be provided to APC, the Queensland Minister for Natural Resources, Mines and Water, the Queensland Minister for the Environment, any Assessment Managers under the *Integrated Planning Act 1997* (IPA) and the Australian Government Minister for the Environment and Heritage (under the EPBC Act).

The Project will require a pipeline licence under the *Petroleum and Gas (Safety and Production) Act 2004* (P&G Act) and an environmental authority (petroleum activities) under the *Environmental Protection Act 1994* (EP Act). Activities authorised under the P&G Act are exempt from the IPA. The Project will also require a pipeline licence under the *Petroleum Submerged Lands (Qld) Act 1982* for that portion of the pipeline in Queensland Waters.

The CG Report for the EIS may state conditions for the proposed pipeline licence under the P&G Act and/or environmental authority under the EP Act. Similarly, if a development approval is required under the IPA, the CG Report may state for the assessment manager one or more of the following:

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

Alternatively the Report must state for the assessment manager –

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

Northern Territory Assessment

The environmental impact assessment process in the Northern Territory is controlled by the *Environmental Assessment Act 1982* and *Environmental Assessment Administrative Procedures 1984*. The Minister for Natural Resources, Environment and Heritage (the Minister)

is responsible for administering this process, with assistance from the NT EPA Program. Under these provisions, the Minister provides recommendations to the Minister responsible for consent (in this case, the Minister for Mines and Energy) at the completion of the assessment process. These ToR constitute the Guidelines defined under the Northern Territory provisions.

Once submitted by APC, the Draft EIS will be advertised for public comment and circulated to relevant government advisory bodies for review for a minimum of 28 days. Submitted comments will be forwarded to the proponent as soon as practicable. APC will be required to prepare a Supplement to the Draft EIS addressing these comments, and submit this document to the Minister. As with the Draft EIS, the Supplement will be circulated to government advisory bodies for review and comment. During the first 21 days from the receipt of the Supplement, the Minister may call for further information from APC if required. The Draft EIS and the Supplement are collectively referred to as the EIS for the proposal.

Assuming no further information is requested, the NT EPA Program will prepare an assessment report and recommendations based on the draft EIS, the Supplement and agency comments within 35 days of receiving the Supplement. This report may include:

- Conclusions about environmental aspects of the proposal;
- Recommendations for approval conditions to be included in permits, leases and/or licences; and
- Recommendations for relevant management procedures.

The assessment report and recommendations will be forwarded by the Minister to the Minister for Mines and Energy, and provided to the Australian Government Minister for the Environment and Heritage (under the EPBC Act). The concluding step in the assessment process is the placement of the assessment reports and environmental recommendations on the Public Register.

Any approvals and licences for construction and operation of the pipeline within the Territory will be administered by the NT Government under the *NT Petroleum (Submerged Lands) Act 2005* within NT coastal waters, and under the *NT Energy Pipelines Act 2005* for the shore-based pipeline. All aspects of construction, commissioning, operation and decommissioning of the sub-marine marine pipeline will be required to conform with the Australian Government's *Petroleum (Submerged Lands) (Management of Environment) Regulations 1999*.

Australian Government Assessment

The key stages of the EPBC Act assessment process are as follows:

- Referral under the EPBC Act is submitted to DEH.
- A decision on whether or not the proposal is a controlled action under the EPBC Act is made.
- Preliminary information is provided to DEH by APC.
- A decision on the assessment approach (level of assessment) is made (EIS directed).
- Draft Guidelines placed on public exhibition (minimum of four weeks), written submissions are invited.
- The Guidelines are finalised, taking into account public submissions, and provided to the proponent.
- The proponent prepares the Draft EIS document and provides it to DEH for approval to publish.
- Public exhibition of the Draft EIS, written submissions are invited.
- The proponent prepares and lodges a final EIS (this may be either a complete new document or a supplement to the draft EIS) that responds to public submissions.

- DEH assesses the Supplementary EIS / Response Document and prepares an assessment report for the Australian Government Minister for the Environment and Heritage.
- The Australian Government Minister makes the decision on approval or otherwise for the proposal. In making this decision the Minister must consider the following:
 - Assessment documents produced by the proponent;
 - The assessment report;
 - Advice from relevant States and Territories stating that the certain and likely impacts of the action on things other than matters protected by the controlling provisions for the action have been assessed to the greatest extent practicable;
 - Advice from relevant Australian Government ministers with an administrative responsibility for the proposal;
 - Economic and social matters; and
 - The principles of ecologically sustainable development.

The three assessing bodies will, as far as possible, coordinate their respective assessment reports and possible approval conditions to avoid any unnecessary duplication.

These Guidelines/ToR are presented in two broad categories:

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

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ABBREVIATIONS

The following abbreviations have been used in this document:

AHD	Australian Height Datum
CHMP	Cultural Heritage Management Plan
CG	The Coordinator General of the State of Queensland
DEH	Australian Government Department of the Environment and Heritage
DMR	Queensland Department of Main Roads
DNRMW	Queensland Department of Natural Resources, Mines and Water
DPIF	Queensland Department of Primary Industries and Fisheries
DSDTI	Queensland Department of State Development, Trade and Innovation
EA Act	<i>Environmental Assessment Act 1982 (NT)</i>
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EP Act (NT)	<i>Energy Pipelines Act 2005 (NT)</i>
Qld EPA	Queensland Environmental Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
IAS	Initial Advice Statement as defined by Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>
IPA	<i>Integrated Planning Act 1997 (Qld)</i>
NOI	Notice of Intent as defined under <i>Environmental Assessment Act 1982</i>
NT DPI	Northern Territory Department of Planning and Infrastructure
NT EPA Program	Northern Territory Environmental Protection Agency Program
NRETA	Northern Territory Department for Natural Resources, Environment and the Arts
P&G Act	<i>Petroleum and Gas (Safety and Production) Act 2004 (Qld)</i>
P(SL) Act	<i>Petroleum (Submerged Lands) Act 2005 (NT)</i>
RoW	Right of way
SDPWO Act	<i>State Development and Public Works Organisation Act 1971(Qld)</i>
ToR	Terms of Reference as defined by Part 4 of the <i>State Development and Public Works Organisation Act 1971</i>

Part A: INFORMATION AND ADVICE ON PREPARATION OF THE EIS

1. Introduction

These Guidelines or Terms of Reference (ToR) are for an Environmental Impact Statement (EIS) for the PNG to Queensland Gas Pipeline Project – Gove Lateral. The Guidelines/ToR have been prepared in accordance with the requirements of Section 102 of the Australian Government *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); Sections 29 and 30 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) and in accordance with the NT *Environmental Assessment Act 1982*.

The objective of the Guidelines/ToR is to identify those matters that should be addressed in the EIS for the Project that has been described in the Initial Advice Statement (IAS)/Notice of Intent (NOI) and the Referral and Preliminary Information submitted by APC to the Australian Government Department of the Environment and Heritage (DEH).

The Australian, Queensland and Northern Territory Governments, from which the proponent requires approvals, may expand or revise the Guidelines/ToR as required to address issues that emerge in the conduct of the EIS process. DEH has ultimate responsibility for decisions on matters of interpretation of the requirements of the Guidelines/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 arrangements 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 separable document that can be made available to the public.

2. EIS Objectives

The objective of the EIS is to ensure that all potential environmental, social and economic impacts of the Project are identified and assessed and, where possible, how adverse impacts would be avoided. Direct, indirect and cumulative impacts must be fully examined and addressed. The Project, including selection of the route, should be based on sound environmental protection and management criteria.

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the Project and the management measures employed to mitigate residual impacts. The EIS documentation should provide:

- For interested persons and bodies: a basis for understanding the Project, prudent and feasible alternatives, affected environmental values, impacts that may occur and measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in the land: an outline of the effects of the Project on that land including access arrangements.
- For government agencies and referral bodies: a framework for decision-makers to assess the environmental aspects of the Project with respect to legislative and policy provisions and based on that information to make an informed decision on whether the Project should proceed or not and if so, on what conditions, if any.
- For the Australian Government: information to determine the extent of potential impacts of the Project on matters of national environmental significance, in particular: listed threatened species and communities under Sections 18, 18A; marine environment under

Sections 23, 24A; and Commonwealth Land under Sections 26 and 27A of the EPBC Act.

- For the proponent: a mechanism by which the potential environmental impacts of the Project are identified and understood. Information to support the development of management measures including an Environmental Management Plan (EMP), to mitigate the adverse effects of residual environmental impacts of the development.

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

3. General EIS Guidelines

The EIS is to provide stakeholders with sufficient information to understand the type and nature of the Project, the potential environmental, social and economic impacts and the measures proposed by the proponent to mitigate all adverse impacts on the natural, built and social environment. It should be recognised that Australian, State/Territory and Local Governments, special interest groups and the general public will have an interest in the EIS.

All phases of the Project should be described in the EIS including pre-construction, construction, operation and decommissioning including final rehabilitation. Direct, indirect and cumulative impacts should be identified and assessed with respect to the environmental values of the Project area. Cumulative impacts should also account for the extent to which the environment has already been affected by existing developments. The reliability and validity of forecasts and predictions should be indicated as appropriate.

Specifically, the EIS should provide:

- An executive summary of the potential environmental impacts of the Project.
- An overview of the proponent and its existing operations.
- A description of the proposal's objectives and rationale, as well as its relationship to strategic policies and plans.
- A description of the entire Project, including associated infrastructure requirements.
- A description of feasible alternatives capable of substantially meeting the proposal's objectives.
- An outline of the various approvals required for the Project to proceed.
- Descriptions of the existing environment, particularly where this is relevant to the assessment of impacts.
- Measures for avoiding, minimising, monitoring and managing residual impacts, including a statement of commitment to implement the measures.
- An assessment of the nature and extent of the likely short term and long term impacts, including whether impacts are likely to be unknown, unpredictable or irreversible.
- Rigorous assessment of the residual risks of environmental impacts arising from the Project and relevant alternatives on environmental, social and economic values, relative to the 'no project' scenario. The extent of baseline and predictive studies should be commensurate to risks. Baseline studies should be sufficient to serve as a benchmark against which the impacts of the Project may be assessed over an extended period. Assessments should address direct and indirect, combined, short- and long-term, beneficial and adverse impacts, as well as cumulative impacts in combination with other known activities. An estimation of the reliability of predictions should also be provided.
- A description of stakeholder consultation undertaken.
- Responses to issues raised during public and stakeholder consultation.

The main report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. The EIS will therefore consist of the main report together with appendices.

In preparing the EIS, the approach to be adopted requires that:

- Predictions of environmental impacts are based on scientifically supported studies.
- The EIS is to present all technical data, sources of authority and other information used to assess impacts.
- The methods used to undertake the specialist studies are outlined, together with the relevant assumptions and professional or scientific judgments.
- The scientific reliability of investigations and predictions is indicated, including the estimated degree of certainty or if possible, statistical confidence wherever appropriate.
- Proposed measures to mitigate and manage identified issues are described and evaluated.
- Residual impacts that are not quantifiable are described qualitatively, in as much detail as reasonably practicable.

The assessment of all environmental impacts needs to encompass both potential impacts on and uncertain risks to the environment. The level of investigation of potential impacts or particular risks needs to be proportionate to both the severity of the potential consequences of possible events and the likelihood of those events occurring.

Specific types of relevant impacts requiring investigation are set out in Part B. However, the EIS will need to address other issues or aspects that may emerge during the investigations and preparation of the EIS. Ultimately, it is APC's responsibility to ensure that adequate studies are undertaken and reported.

4. Stakeholder Consultation

The proponent should undertake a comprehensive and inclusive program of consultation with government agencies, key stakeholders and interested parties. The consultation program should provide stakeholders with the opportunity to obtain information about the Project, to raise issues and express their concerns and to receive feedback on how the proponent intends to address the issues and mitigate all adverse impacts of the Project. Consultation with the assessment and advisory agencies should be the principal forum for identifying legislation, policies, regulations and guidelines relevant to the Project and EIS process.

Where appropriate, information bulletins and discussion papers should be used to disseminate information about the Project to a wider audience and to inform stakeholders of the proponent's progress in the EIS process, in particular on specific issues.

The proponent is encouraged to provide opportunities for the general public to obtain information about, and comment on, the Project through such forums as road shows or public information sessions.

5. General EIS format

The EIS should be in written format in the form of the Guidelines/ToR or include (preferably as an appendix) guidelines on how the EIS responds to the Guidelines/ToR.

The EIS documentation is to include appendices containing:

- A copy of the final Guidelines/ToR.
- A list of persons, interest groups and agencies consulted during the EIS.
- A list of advisory agencies consulted 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 to assist in the interpretation of the information.

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 CDROM. CDROM copies should be in Adobe® PDF format for placement on the internet. All compression must be down-sampled to 72 dpi. PDF documents should be no larger than 500 kB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500 kB file size.

Part B: SPECIFIC REQUIREMENTS – CONTENTS OF THE EIS

The EIS report should include the following sections but need not be limited to these sections or inferred structure.

Executive Summary

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.

The structure of the Executive Summary should generally follow that of the EIS but focus on key issues to enable the reader to obtain a clear understanding of the Project and its potential adverse and beneficial environmental, social and economic impacts and the management measures to be implemented by the proponent to mitigate all residual impacts.

The Executive 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 and their commitment to effective environmental management.
- A concise statement of the aims and objectives of the Project.
- The legal framework, decision-making authorities and advisory agencies.
- An outline of the background 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, utilising visual aids where appropriate.
- An outline of the principal environmental impacts predicted and the proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts.

Glossary of Terms

A glossary of technical terms and acronyms should be provided.

1. Introduction

The introduction should clearly explain the purpose of the EIS, to whom it is directed and contain an overview of the structure of the document.

1.1 PROJECT PROPONENTS

This section should describe the relevant experience of the Project proponent, including nature and extent of business activities, experience and qualifications, and environmental record including the proponent's environmental policy.

1.2 PROJECT DESCRIPTION

This section should provide a brief description of the key elements of the Project.

1.3 PROJECT RATIONALE

This section should set out what the Project aims to achieve. It should describe the current status of the Project and outline the relationship of the Project to other developments or actions to which it may relate.

1.3.1 *Need for the Project*

The EIS should describe the justification for the Project in a regional, state and national context. This section should describe:

- The existing energy market in Queensland, Northern Territory and Australia.
- Strategic, economic and environmental implications of the proposal including future energy consumption and production and supply security.
- Increased demands on natural resources (reserves of natural gas).
- Identification of customers (industrial, non-industrial and domestic), potential customers for the natural gas and the implications for the consideration of an open access policy.
- The Project's technical feasibility and commercial viability including potential customers and target markets, immediate and long-term implications for the gas transmission network, and consideration of an open access policy.
- The Project's compatibility with the National Greenhouse Strategy, Government Ecologically Sustainable Development policy, Queensland Energy Policy, National Strategy on Conservation of Australia's Biological Diversity and any other relevant policy.

1.3.2 *Costs and Benefits of the Project*

This section should summarise:

- The economic costs and benefits to customers, other industry and the wider community.
- Regional social impacts including employment, skills development and any workforce accommodation issues.

1.4 ALTERNATIVES TO THE PROJECT

This section should describe feasible alternatives within the proposed Project, including the option of taking no action i.e. of not building the pipeline. Alternatives should be discussed in sufficient detail to enable an understanding of reasons for preferring certain options and courses of action and rejecting others. Reasons for selecting preferred options should be delineated in terms of technical, commercial, social and natural environment aspects. In particular, discussion of reasonably practicable alternatives to the Project should include:

- Alternative routes considered, 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.
- Alternative gas supply scenarios.

1.5 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

1.5.1 Methodology of the EIS

This section should provide an outline of the approvals processes of the three jurisdictions and the coordinated process being followed, including the environmental impact assessment process and any associated licence or permit application processes. It should include information on the relevant stages of the approvals process, statutory and public consultation requirements and any interdependencies that exist between the approvals sought.

1.5.2 Objectives of the EIS

This section should provide a statement of the objectives of the environmental impact assessment process, detail how the relevant legislation will be addressed and highlight the EIS as the key environmental document for providing advice to decision makers considering approvals for the Project. It should be highlighted that the purpose of the EIS is to:

- Provide public information on the need for, and likely effects of the Project;
- 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.

The relationship of other Project environmental management planning documentation, conditions, approvals and environmental authorities should be discussed in relation to the EIS.

1.5.3 Submissions

Interested and affected persons should be made aware of how submissions on the EIS will be addressed and taken into account in the decision-making process. The EIS should inform the reader on:

- How to make submissions;
- What form the submissions should take; and
- When submissions must be made to gain standing for any appeal process.

1.6 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 an inclusive program which provides opportunities to encourage and facilitate active community involvement and education.

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

The Indigenous component of the public consultation program should be underpinned by the following guiding principles:

- Engagement that is inclusive rather than exclusive.
- Engagement that is geographically specific.
- Engagement that uses appropriate language and media.
- Engagement that takes into account the education and entry level of Indigenous participants.

In particular, the EIS should describe:

- The proponent's program for communicating and consulting with the public and stakeholder groups during the course of the EIS preparation and include the information provided and the methods for engaging with local stakeholders in the assessment of social and economic impacts.
- The outcomes of consultation undertaken as part of specific impact studies, the issues and suggestions of stakeholders or members of the public (by theme and source, rather than individually) and the response made by the proponent in the context of either the EIS studies or the refined proposal.
- An outline of a program for community consultation and communications during construction and operation of the pipeline, including means for the local community to engage with APC management to address and respond to potential community concerns, participation in ongoing monitoring of environmental impacts, and means for the community to participate in the continuous improvement of the Environmental Management Framework.

1.7 PROJECT APPROVALS

1.7.1 *Relevant Legislation and Policy Requirements*

The EIS should identify all relevant legislation, policies and strategies, as well as assess their specific implications and requirements for the Project and impact assessment. Reference should be made to the Australian Government EPBC Act, Queensland SDPWO Act and EP Act, Northern Territory EA Act and other relevant Australian, Queensland and Northern Territory laws. A description should be given of the Environmentally Relevant Activities and activities capable of having a significant effect on the environment which are necessary for each aspect of the Project.

The proponent will need to identify and address other strategies, subordinate legislation and related management or planning processes that may be relevant to the assessment of the Project. For example, the proponent should clearly identify all activities either directly or indirectly associated with the project that will require development approval under the Queensland *Integrated Planning Act 1997*.

1.7.2 *Planning Processes and Standards*

This section should identify all relevant Australian, State, Territory, regional and local planning policies and plans and discuss how the Project complies with these policies and plans. This section should outline the Project's consistency with existing land uses or long-term policy framework for the pipeline route and with legislation, standards, codes or guidelines available to monitor and control operations on site.

2. Description of the Project

This section should describe the Project and its components including how it would be constructed, operated and decommissioned (including rehabilitation) and any supporting compression requirements. Details should include:

- Design parameters for aspects of the Project that may impact upon endangered and threatened species.
- A program covering activities relating to design, construction, commissioning and first operating activities.
- The physico-chemical characteristics of the transmitted gases.

2.1 ROUTE SELECTION PROCESS AND DESCRIPTION OF PROPOSED ROUTE

This section should describe the route selection process used to identify the proposed route and any feasible alternatives. It should describe the decision-making process that led to the nomination of the proposed route, and describe the proposed route in a travelogue format, listing key features encountered by the proposed route from start to end and key issues to be addressed in the impact assessment.

2.2 GAS PIPELINE

This section should provide a detailed description of the proposed gas pipeline including ancillary infrastructure. The proposed pipeline route should be illustrated on maps at suitable scales. The Project should be described with reference to the following:

- Map of the preferred route, with interpretation, using cadastral and topographical maps.
- For the preferred pipeline route describe, with the aid of maps and diagrams, the location and/or frequency of cathodic protection points, sales taps, compressor stations, control valves (isolation points), and any other Project facilities and linkages to existing gas pipelines.
- Design parameters covering, pipe grade, diameter(s), wall thickness, length, capacity, test and operating pressures, depth of cover over the pipe, minimum depths of cover under transport infrastructure, coating and design life.
- Pipeline case design with regard to relevant Australian Standards and other legislative requirements, and design requirements and limitations imposed by site characteristics.
- Above ground facilities - physical dimensions and construction materials for surface facilities along the pipeline route including information on pipeline markers.
- Presence or absence (with reasons) of a series of remote controlled shut-off and purging valves in the pipeline.
- Location of (marine) areas where the pipeline is to be buried or not buried and armoured or un-armoured, with an explanation for these decisions. In the event that the pipeline or structures may need to be constructed above ground at the shore crossing, the reasons and details of the locality should be given.
- 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. The nature of any permanent access points should be described.
- Easement widths and access requirements along the route, including the use of existing areas of disturbance for pipeline access, separation and distance from major transport infrastructure and future maintenance.
- Engineering design concepts and pipeline management principles.
- Requirements for the construction right of way (RoW).
- Location of temporary above ground infrastructure.

- Location of existing infrastructure including roads, railways, bridges, access tracks, dams and weirs, pipelines (water, gas, oil and slurry) and overhead and underground electricity and telecommunication cables and structures that might be affected by construction and operation of the pipeline.
- Construction program for the Project.

2.3 COMPRESSION FACILITIES

This section should provide a description and layout of the compression facilities, including:

- Map showing location of any such facilities.
- Purpose of the facility.
- Details of how these facilities operate.
- Reasons for the location chosen of each facility.
- Photographs of similar existing facilities.
- On-site plans, layouts, boundaries and elevations.
- Detailed concept and staging (if any proposed) for additional compression 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 utilised.
 - Public safety and emergency procedures.

2.4 PRE-CONSTRUCTION ACTIVITIES

A description of the pre-construction activities should be set out in this section, including:

- Upgrading of roads, railways and other infrastructure.
- Development of lay-down areas.
- Location and site establishment requirements for construction camps.
- Location of dams to be constructed and bores to be drilled to provide for construction water supply.
- Details from a whole of project perspective of the quantity of material required for ancillary construction activities (roads, concrete structures etc) and bedding materials for the pipeline from quarries, pits and extraction areas for sand and gravel. An indication of the split between riverine and other sources should be provided.

2.5 CONSTRUCTION ACTIVITIES

The full extent and nature of the Project's construction phase should be described. The description should include:

- Pipeline spread activities i.e. groups of construction personnel, pipe-string fabrication and pipe-laying equipment.
- Offshore construction method and activities.
- Landfall construction method and activities
- 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.
- Possible interruption of pipeline laying to other water activities, e.g. interruption to shipping, fishing activities etc.
- Extent that service corridors would 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 cross reference where in the EIS the impacts on such vegetation have been addressed.
- A Vegetation Clearing Plan developed as part of the Construction Environmental Management Plan. Management of land clearing should be in accordance with *Code of Environmental Practice – Onshore Pipelines* (The Australian Pipeline Industry Association Inc., 1998).
- An assessment of the statutory obligations under NT legislation for permits to clear native vegetation and appropriate timelines to allow for application assessment and approvals.
- Management of soil during construction with detailed information contained in section 3.2.3.
- 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 (see section 3.7.2).
- 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 would need to be altered within and/or diverted out of any waterway during pipeline construction with detailed information contained in section 3.4.2. Where in-stream infrastructure is in place, identify practicality of attaching the pipeline to these structures.
- Design detail in relation to filling and top-cladding the void between upstream and downstream bunds (or sandbags) at the creek crossings. The description should specify if the area between the bunds is to be generally underwater, or dry, how these structures will resist extreme wet-season flow events and how snagging and blocking of the flume pipe will be prevented.
- For crossings of streams that become seasonally dry, details of how contouring will prevent pooling at either pipe end to prevent creation of mosquito breeding habitat.
- Management of spread of weed seed, 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.
- Testing the pipeline's integrity, including cathodic protection requirements, launcher and receiver scraper stations and hydrostatic testing are to be outlined.
- Cleanup and restoration (rehabilitation) of areas used during construction including camp sites and storage areas (see section 3.3.2).
- Type and methods of construction including methods for crossing watercourses and other infrastructure. The process and criteria used to determine the crossing method for watercourses should be described. Details of criteria to assess the minimum depth the pipeline is to be buried under creeks, rivers and ephemeral waterways taking into account one in one hundred year (Q100) flood events.
- Construction traffic, access and haul routes.

- Estimated number of people to be employed during construction and arrangements for their transport to and from the RoW and to and from the Project area, including proposed use of regional or charter air services.
- An outline of any protocols or rescue plans that will be implemented should domestic or wild animals be injured or unable to escape from the trenches. These plans and protocols need to be compatible with any relevant animal welfare legislation (see section 3.3.3).
- The sources of quarry material, how it is located and environmental management including resource allocations for material in water courses needs to be explained with reference to section 3.2.3.

2.6 COMMISSIONING ACTIVITIES

This section should describe the activities involved in commissioning the pipeline.

2.7 OPERATION ACTIVITIES

This section should describe the pipeline operation and maintenance, including:

- Inspection and surveillance activities and frequency.
- Impact on waterways as a result of operation and maintenance activities.
- Safety procedures, including provision for shut-down and/or venting in event of an emergency.
- Provision for public safety in such circumstances.

2.8 DECOMMISSIONING ACTIVITIES

This section should describe:

- The strategies and methods for decommissioning of the pipeline, including progressive and final rehabilitation of land disturbed by the Project. It should detail how the pipeline and ancillary equipment including buildings and structures would be removed or made safe, if left in-situ.
- Any possible future uses of the pipeline and the onshore facilities.
- Any future proposed disturbance to waterways and associated fisheries resources as a result of decommissioning activities should be described.
- Decommissioning and rehabilitation timetable for both temporary and permanent facilities.
- Proposed rehabilitation of construction areas, including camp sites and storage areas.

The EIS should outline the development and implementation of rehabilitation success criteria for the decommissioning of the pipeline RoW at the end of operational life.

2.9 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 pipeline and compression facilities. The report should 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, and if applicable, their family members.

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.
- Indoor air quality.
- Dust and noise control in relation to proximity of camp site to the construction area.
- 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. Camps in the NT should conform to the Government publication: *Information Bulletin No. 6 Requirements for Mining, Construction & Bush Camps*.

2.10 GAS SUPPLY

This section should provide an analysis of the gas at extraction and the gas to be transported. Security of supply and resource availability should also be discussed.

2.11 ELECTRICITY AND TELECOMMUNICATIONS

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

Telecommunications requirements should also be noted.

2.12 WATER SUPPLY/STORAGE

The EIS should provide information on water usage by the Project, including the quality and quantity of all water to be used. In particular, the proposed and optional sources of water supply should be described (e.g. bores, mine water, any surface storages such as dams, weirs, watercourses and municipal water supply pipelines, etc).

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

Determination of potable water demand should be made for the Project, including the temporary demands during the construction period. Details should be provided of any existing town water supply to be used to meet such requirements. If water storage and/or treatment are 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, and microbiological and chemical testing program.

2.13 TRANSPORT

This section should provide a brief overview of transport requirements. Full details of transport volumes and routes should be provided under Section 3.9 Traffic, Transport and Access Arrangements.

2.14 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 3.7 Waste.

3. Environmental Values & 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, 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:

- 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.
- Present environmental protection objectives and the standards and measurable indicators to be achieved.
- Examine viable strategies for managing impacts.

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 Queensland *Environmental Protection Act 1994*, Environmental Protection Objectives under the Northern Territory *Waste Management and Pollution Control Act 1998*, and any catchment management plans prepared by local water boards or land care groups. 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. Details of methods to protect aesthetic values to ensure protection of ecotourism values should be provided.

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 4).

3.1 CLIMATE

This section should describe climatic conditions in the Project area and seasonal conditions (e.g., cyclones, thunderstorms, floods and storms) that may influence timing and/or construction methods and how this would be managed.

This section should include a discussion on how weather would be monitored to minimise the risk of adverse impacts to the Project area during the construction period.

3.2 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.

3.2.1 Land Use and Infrastructure

Description of Environmental Values

The EIS should identify the following, with the aid of maps:

- Land tenure (including reserves, tenure of special interest such as protected areas and forest reserves, roads and road reserves, railways and rail reserves, and stock routes).
- Land use (urban, residential, industrial, agricultural, forestry, recreational, mining including mining and petroleum exploration tenures, mining leases, mining claims, mineral development licences, petroleum leases and pipeline 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. A description of Native Title Representative Bodies (NTRB) boundaries should be provided.
- Information on any known occurrences of economic mineralization, gas and oil fields and extractive resources within the Project area.
- Location of gas and water pipelines, power lines, telecommunication cables, roads, railways, bridges, airports, airstrips, helipads and any other infrastructure.
- Location of mines and mineral processing plants, gas and oil wells, processing plants and storage facilities.
- Distance of facilities and pipelines from residential and recreational facilities.
- Location of fences and gates to be crossed by the pipeline or constructed for pipeline access.

Potential Impacts and Mitigation Measures

This section should include the following:

- Identification of any land units requiring specific management measures.
- Assessment of the compatibility of the proposal with surrounding land uses (e.g. mining).
- Description of 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.
- Proposed measures to minimise impact on Good Quality Agricultural Land.
- The strategy and progress in relation to making of Native Title agreements, including NTRBs, 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.
- Discussion of potential issues involved in proximity of the gas pipeline to electric power 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.
- Possible impacts on, or sterilization of, identified mineral or energy resources and extractive industry deposits, the amount of sterilization (if any) of the deposits resulting from the construction and/or operation of the pipeline and associated infrastructure.
- Identification of any millable timber or quarry resources on the pipeline route and an assessment of the commercial value of these resources to satisfy the requirements of the Queensland Department of Primary Industries and Forestry.

3.2.2 Topography and Geomorphology

Description of Environmental Values

Maps should be provided locating the Project and its environs in both regional and local contexts. The topography along the pipeline route 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 soils may be disturbed, and for major watercourse crossings, surrounding topography should be mapped in appropriate detail with levels shown with respect to AHD.

Potential Impacts and Mitigation Measures

- The Project should be discussed 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 re-vegetation.

3.2.3 Geology and Soils

Description of Environmental Values

The EIS should provide a description and maps of the geology of the Project areas, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance, especially at watercourse crossing locations. Geological properties that may influence: ground stability (including seismic activity, geological faults and associated geological hazards); rehabilitation programs; or the quality of wastewater leaving any area disturbed by the proposal should be described.

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 would influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land, for example for dry-land cropping, irrigated cropping or grazing uses. Information should also be provided on soil stability and suitability for construction of all Project facilities. Any previous disturbance, mining or development of the pipeline pathway should be described.

Soil 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 soil 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)*, which supports *State Planning Policy 1/92: Development and the Conservation of Agricultural Land*.

This section should discuss the potential for:

- The existence of acid sulphate soils within the disturbance zone of the pipeline.
- The existence of Good Quality Agriculture Land along and adjacent to the proposed pipeline route including alternative routes, as outlined in Section 1.4.
- 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 the Contaminated Land Register, the Environmental Management Register and consultation with Alcan Gove regarding areas of known contamination on the Alcan mining lease.

Potential Impacts and Mitigation Measures

This section should provide details of any potential impacts to the land resources and proposed mitigation measures, including:

- The availability and suitability of rock, sand and gravel for trench padding and road construction materials.
- The environmental consequences of the excavation and removal of soils from borrow pits and from excavation and backfill of the pipe trench.
- 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 sulfate soils that may be encountered in association with the Project should be consistent with the guidelines that support *State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulfate 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 and/or operation.
- Details of erosion control measures and criteria used to assess methods that would minimise or 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.
- Details of erosion control measures planned for the cleared camp sites.
- 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 topsoil to disturbed areas. The minimisation of topsoil 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.

3.3 COASTAL AND MARINE ENVIRONMENTS

3.3.1 Description of Environmental Values

This section should describe the existing coastal and marine environments, which may be affected by the Project in the context of coastal values identified in *State of the Coastal Zone Reports* and environmental values as defined by the Queensland *Environmental Protection Act 1994*, the NT *Integrated Natural Resource Management Plan* (March 2005), the National Oceans' Office *Snapshot of the Northern Planning Area* and environmental protection policies. The Queensland Environmental Protection (Water) Policy has a set of default environmental values for waterways that include aquatic ecosystem protection.

In particular, the EIS should:

- Describe the broad physical and ecological characteristics of the proposed offshore pipeline route.
- Describe inter-tidal and marine habitat zones, including nesting sites of turtles or birds and coastal landform features.
- Describe and interpret the habitat requirements of marine non-benthic species, including vertebrates (fish, reptiles, marine mammals) and macro-invertebrates on the pipeline's marine route.

- Describe the traditional, recreational and commercial fisheries of the Gulf of Carpentaria, in particular those whose activities occur along or in the vicinity of the proposed offshore pipeline route.
- Describe and characterise the benthic habitats of the proposed offshore pipeline route including the near-shore environments of the proposed landfalls.
- Describe and interpret the main marine benthic species assemblages in each of the main benthic habitat types present on the pipeline route. Provide biodiversity measures for the habitats to give quantitative interpretation of the data.
- Detail the extent and implications of possible impacts to landform and seabed features/sites from construction of the pipeline shore crossing, including a discussion of impacts to visual amenity.
- Provide details of the landfall sites, particularly any impact-sensitive features.

This section should also identify actions associated with the Project that are assessable development within the coastal zone and will require assessment under the provisions of the Queensland *Coastal Protection and Management Act 1995*.

Marine Water and Sediments

The EIS should provide baseline information on water quality in the sea and in estuaries below the limit of tidal influence, including heavy metals, acidity, turbidity and oil in water. The interaction of freshwater flows with marine waters its significance in relation to marine flora and fauna adjacent to the proposal area should be discussed.

This section should describe the environmental values of the coastal seas of the affected area in terms of:

- pH, suspended solids, nitrogen and phosphorous (using Standards AS/NZS 5567:6 and 12 and ISO 5567:19 for water / sediment sampling).
- Values identified in the Queensland *Environmental Protection (Water) Policy 1997*.
- The Queensland *State Coastal Management Plan* and the relevant Queensland *Regional Coastal Management Plan*.
- Values identified in the *Integrated Natural Resource Management Plan of the Northern Territory (2005)*, the National Oceans' Office *Snapshot of the Northern Planning Area* and the 'beneficial uses' as defined in the NT *Water Act 2004*

An assessment of physical and chemical characteristics of sediments should be provided in:

- The areas to be dredged within the full extent of development.
- The disposal location for dredged material, if offshore disposal is proposed.

Information provided should be consistent with Queensland EPA requirements (as outlined on the Qld EPA website) for the disposal of dredge spoil.

Any contaminants and implications for management of the trenched material should be described. The description of sediment characteristics should be based on the results of sediment sampling and analysis conducted as per a Sampling and Analysis Plan approved under the Australian Government *Environment Protection (Sea Dumping) Act 1981*. The chemical and physical characteristics of the material to be dredged, the spoil ground and control sites should be summarised. If surplus material from trenching is to be disposed in an offshore area, a statement as to the suitability of the sediment for unconfined ocean disposal should be made using the framework within the National Ocean Disposal Guidelines for Dredged Material (DEH 2002).

Coastal & Marine Processes

This section should describe the physical processes of the adjacent marine environment, including but not limited to currents, tides, wave action and storm surges. The environmental values of the coastal resources of the affected area should be described in terms of the physical integrity and morphology of landforms created or modified by coastal processes. Assessment should be based on hydrodynamic investigations and include a description of:

- Prevailing currents, range of wave heights and tidal range.
- The physical properties of the sediments likely to be trenched.
- Sediment dynamics and pathways around the mouth of the rivers near the pipeline landfall sites on the Queensland and Northern Territory coast lines. Analysis should be made of the stability or potential instability/erodibility of marine and inter-tidal substrates in extreme weather or current events or in the context of any altered hydrodynamics caused by the pipeline. Any previous disturbance, mining or development of the pipeline pathway should be described.
- Sediment dynamics at the offshore disposal ground (if proposed) based on the influence of tides, waves, currents and turbidity.
- Potential cyclonic storm-surge heights, cumulative with Spring tide, and maximum wave heights.

The relationship of these processes to marine flora and fauna, biological processes, recreational and commercial fisheries productivity within the study area should also be discussed. The relationship between currents, wave actions and extreme events (such as cyclones) and how they influence coastal and marine processes should also be discussed.

The implications for pipeline location and construction should be assessed in the context of the dynamics of coastal processes and sea bed sediment movement.

3.3.2 Potential Impacts and Mitigation Measures

Marine Water and Sediments

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

The water quality objectives used (including how they were developed) should be described, and how predicted activities would meet these objectives (refer to the Queensland EPA's Queensland Water Quality guidelines and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000).

The potential environmental harm caused by the Project on coastal and marine resources and processes should be described in the context of controlling such effects. The Queensland *State Planning Policy – Planning and Managing Development involving Acid Sulfate Soils 2002* should be addressed as should the Queensland *State Coastal Management Plan 2001*, the Queensland *DPI Guidelines for Marine Areas*, and the *Integrated Natural Resource Management Plan* for the Northern Territory.

The role of buffer zones in sustaining fisheries resources through maintaining connectivity between coastal and riparian vegetation and estuarine and freshwater reaches of catchments should be discussed. Pipeline impacts on existing fishing grounds should be discussed, along

with any factors affecting local fisheries, including impacts on seagrass beds, mangroves and sites of spawning aggregations or fish nursery areas.

Impacts on water quality due to increased water turbidity and nutrients being brought into the water column from the sediment due to trenching and sea disposal of material, if required, should be addressed and strategies developed to address potential impacts. Leachate into the water column from the pipeline and coating should be predicted, as well as its potential impacts on marine biota.

In addition to the above considerations, the following guidelines and standards should be considered:

- The *Environmental Protection (Water) Policy 1997*, and any recent or proposed amendments that incorporate recommendations of the *National Environment Protection Measures*.
- *ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters (2000)*;
- Amelioration or mitigation measures to address each activity identified to impact on local and regional water quality.
- Any monitoring of water quality recommended during past dredging activities at the port to ensure environmental values are protected.

The potential impacts of sediment quality on the marine environment should be discussed. This assessment should be guided by the suitability of the trenched sediment for ocean disposal (if proposed) as determined by the framework outlined in the National Ocean Disposal Guidelines for Dredged Material (DEH 2002).

Coastal & Marine Processes

The impacts of development of Project on hydrodynamic processes within the study area should be described and quantified. In particular, impacts on siltation and sediment transport and any implications for marine flora and fauna and/or biological processes should be discussed.

Information on currents in the region should be used to predict impacts from trenching and disposal of surplus spoil and the subsequent impacts on marine environmental values and coastal processes should be assessed.

Impacts of coastal processes on the integrity of the pipeline, particularly the need for armouring and other measures should be discussed. In particular, the impacts of sea bed scour should be investigated and if considered to be significant, appropriate mitigation measures should be outlined. Physical modelling of the sea bed or landfall site may be required to adequately understand the processes that are occurring.

3.4 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 both State and Australian Government legislation and policies on threatened species and ecological communities.

All surveys undertaken should be in accordance with best practice advice from the Queensland EPA and Northern Territory EPA Program 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 vegetation 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 would occur.

The pipeline alignment where the proposed pipeline runs through or adjacent to (within 1 km of) an endangered ecological community, including firm details of footprint width should be discussed. Where the alignment would impact upon a threatened community, the discussion should include reasons for the preferred alignment and the viability of alternatives.

3.4.1 Sensitive Environmental Areas

Description of Environmental Values

The EIS should identify areas that are environmentally sensitive in proximity to the Project. Environmentally sensitive areas should also include areas classified as having national, state, regional or local biodiversity significance, or flagged as important for their integrated biodiversity values. Details of the proximity of the project and related ancillary infrastructure and the potential impact on environmentally sensitive areas (Category A and B – see schedule 1A *Environmental Protection Regulation 1998*) should be described. Endangered and of concern remnants should be considered in terms of their connection to larger remnants and corridors (including not of concern regional ecosystems) to minimise disturbance and isolation of these communities.

The EPBC Act should be addressed with regard to matters of national environmental significance identified by the Commonwealth when the Project was determined to be a controlled action. In addition to the EPBC Act identified species, any other threatened species found during survey work is also afforded the same protection status as those listed below and must be addressed.

Threatened Species		EPBC Act Status
Animals		
<i>Euploea alcaethoe enastri</i>	Gove Crow Butterfly	Endangered
Plants (Cape York Peninsula)		
<i>Dendrobium bigibbum</i> or <i>Vappodes bigibba</i>	Cooktown Orchid	Vulnerable
<i>Dendrobium johannis</i> or <i>Cepobaculum johannis</i>		Vulnerable
<i>Ectrosia blakei</i> (Poaceae)		Vulnerable
<i>Calophyllum bicolour</i>		Vulnerable
<i>Solanum dunalianum</i>		Vulnerable
<i>Brachychiton vitifolius</i>		Vulnerable

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*, the *Territory Parks and Wildlife Act 2000* and/or EPBC Act as presumed extinct, endangered, vulnerable or rare.
- Regional ecosystems recognised by the Queensland 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 Queensland *Nature Conservation Act 1992* or are under consideration for proclamation.

Potential Impacts and Mitigation Measures

This section should discuss the following:

- The impact of the proposal on species, communities and habitats of local, regional or national significance as identified above including EPBC Act listed threatened species and communities.
- Proposals to minimise such impacts (e.g. timing of works, minimise width of disturbance, proposed rehabilitation of in-stream and floodplain disturbances).
- Planned rehabilitation to be applied for all vegetation types of significance and any relevant previous experience or experiments rehabilitating these communities.

3.4.2 Terrestrial Flora

Description of Environmental Values

Terrestrial vegetation maps at a suitable scale (e.g. 1:100,000 generally or 1:50,000 for appropriate detailed 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 Qld EPA's regional ecosystem type descriptions and web site (www.epa.qld.gov.au/environment/science/wildlife/) listing the biodiversity status of regional ecosystems.
- Location of species listed as Protected Plants under the Queensland *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments, or the *Territory Parks and Wildlife Conservation Act 2000*.
- Any plant communities of cultural, commercial or recreational significance should be identified.
- Areas of re-growth or restoration and remnant vegetation.
- 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.
- Any threatened species or communities listed under the EPBC Act.

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 re-growth 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, vegetation surveys should be undertaken at a sufficient number of sites, allowing for seasonal factors. Surveys are to be conducted at the appropriate time of year when the species are known to be present on the site, so that identification and location of these species is optimal. Where this is not possible, the proponent is required to assess the potential impact on the species as if it were to exist. Surveys should be conducted as follows:

- All data requirements of the Queensland Herbarium CORVEG database, the NT *Holtz* (GIS-based) *Database*, and the NT *Herbarium Database* should be collected.
- The minimum site size should be 500 square meters.
- A complete list of species present at each site should be recorded.
- The relative abundance of plant species present should be recorded.
- Any plant species of conservation, cultural, commercial or recreational significance should be identified.
- Vegetation mapping and data should be submitted to the Queensland Herbarium to assist the updating of the CORVEG database, and to the NT *Holtz* (GIS-based) and the NT *Herbarium Databases*, within NRETA.
- 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. All flora specimens from the NT are to be submitted to the NT Herbarium.

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 Queensland *Land Protection (Land and Stock Route Management) Act 2002*, or the NT *Weeds Management Act 2001*, 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 would allow germination.

Potential Impacts and Mitigation Measures

This section should include:

- A discussion of the ability of identified stands of vegetation to withstand any increased pressure resulting from the proposal and identify measures proposed to mitigate impacts.
- A description of the methods to ensure rapid rehabilitation of disturbed areas following construction including the species chosen for re-vegetation which should be consistent with the surrounding associations. Details of any planned seed collection and the timing of re-vegetation works, in relation to the initial land clearing and to seasonal rainfall

should be provided. Details of any post construction monitoring programs and what benchmarks would be used for review of monitoring should be included.

- An outline of the development and implementation of rehabilitation success criteria for the reinstatement of the pipeline ROW after construction has been completed.
- A description of methods of minimising 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 wash-down and any other hygiene protocols.
 - Staff/operator education programs.
 - A weed management plan is required under the NT *Weeds Management Act 2001* to be included in the EMP. The weed management plan should be developed in consultation with local government environmental officers, and cover construction, rehabilitation and operation periods. Best practice weed management should be adopted with particular reference to The Australian Pipeline Industry Association (APIA) *Code of Environmental Practice*.

3.4.3 Terrestrial Fauna

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 that are poorly known but suspected of being rare or threatened.
- Habitat requirements and sensitivity to changes including movement corridors and barriers to movement.
- The existence of feral or exotic animals.
- 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).
- Use of the area by migratory birds, and nomadic birds, fish and terrestrial fauna.

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 year when the species are known to be present on the site, so that identification and location of these species is optimal. Where this is not possible, the proponent is required to assess the potential impact on the species as if it were to exist.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the sub-region where Project sites occur. Site data should be recorded in a format compatible with Qld EPA WildNet database and the *NT Fauna Atlas*.

Potential Impacts and Mitigation Measures

This section should include:

- Impacts the proposal may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values.
- Measures to minimise wildlife capture and mortality in the open trench.
- Details of the methodology that would 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.
- Methods for minimising the introduction of feral animals, and other exotic fauna.
- Description of any fencing of the overland pipeline route that may restrict wildlife passage.
- Effects of construction activities and disposal of construction wastes on biting insect species of pest and health significance, including measures to prevent increases in these species. Preventative measures should be designed in accordance with the guidelines: *Construction Practice Near Tidal Areas in the Northern Territory - Guidelines to Prevent Mosquito Breeding* (NT Coastal Management Committee, June 1988).

3.4.4 Aquatic Biology

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 in the area 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.

Potential Impacts and Mitigation Measures

This section should include:

- A description of the methods used to mitigate and rehabilitate impacts on rivers, waterholes, wetlands, and major river crossings.
- 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).
- Proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that would restrict free movement of fish.
- Measures to avoid fish spawning periods, such as seasonal construction of waterway crossings.
- All permits/authorities required by the Project associated with activities in waterways (e.g. permits under the Queensland *Fisheries Act 1994* to construct temporary or permanent waterway barriers, or under the NT *Water Act 2004* to interfere with a waterway).

3.4.5 Marine Biology

Description of Environmental Values

The EIS should describe the ecological characteristics of the proposed offshore pipeline route.

A description of significant marine fauna including distribution, habitat, feeding (patterns and food sources), reproductive cycles, threatening processes and current level of disturbance should also be provided.

Potential Impacts and Mitigation Measures

The potential impacts of the Project on benthic habitat and marine fauna including rare or threatened species should be assessed.

3.5 WATER RESOURCES

3.5.1 Description of Environmental Values

This section should describe the existing environment for water resources that may be affected by the Project in the context of environmental values as defined in such documents as the Queensland EP Act, Queensland *Environmental Protection (Water) Policy 1997* and ANZECC 2000. Proposed actions potentially affecting water quality should be considered in the context of requirements of the NT *Waste Management and Pollution Control Act 2003*. If a licence or permit would be required under the Queensland *Water Act 2000*, or the NT *Water Act 2004* 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 the application. An indication of the quantities of water required and the potential sources of water should be provided.

This section should describe:

- 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 Queensland *Environmental Protection (Water) Policy* and in terms of 'beneficial uses' as defined in the NT *Water Act 2004*.
 - 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.
 - Any Water Resource Plans relevant to the affected catchment.
 - Existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses.
- Potential sources of water for construction and estimated volumes required, including hydrostatic testing of the pipeline.
- Existing and other potential surface and groundwater users and holders of Quarry Material Allocation Notices.
- Potential sources and quantities of riverine quarry material and the impacts of the extraction of this material.

3.5.2 Potential Impacts and Mitigation Measures

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

- The watercourses to be crossed by the pipeline showing planned crossing locations on a map. Consideration of alternative crossing locations in environmentally sensitive areas should be discussed.

- An evaluation of watercourse crossing construction methods i.e. horizontal directional drilling versus conventional or modified open-cut methods.
- Likely impacts associated with the construction and operation of crossings 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.
- Potential impacts on the hydrology and characteristics of waterways and wetland environments in the Project area.
- The quality of water leaving construction sites (including physical, chemical and biological characteristics), potential impacts for any likely discharged water (e.g. hydrostatic test water) and how the impacts would be assessed.
- Possible sources of water pollution or other changes in water quality including soil erosion, sedimentation, drilling fluids, accidental spills, waste and sewage disposal and likely chemical composition of any leachate from introduced fill on the site.
- Description of the quantity and timing of proposed water extraction from particular waterholes and an assessment of the impact in terms of their viability and persistence in both local terms and in relation to their position in the larger river system.
- 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 water table and secondary influence on flooding. If levee banks or stream diversionary constructions are proposed, the effects on neighbouring landholders should be considered, and any works requiring permits or licensing in accordance with the Queensland *Water Act 2000*, or the NT *Water Act 2004* identified. Any works that take or interfere with water should be identified.
- Proposed drainage structures for all aspects of the Project, including supporting facilities such as access roads.
- Timing of the construction works relative to likely periods of flooding and proposals to minimise the risk of adversely impacting downstream water quality.
- 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.
- Measures to ensure viable weed seeds are not released into the water environment including from machinery traversing creek systems or riparian areas and from hydrostatic testing of the pipeline.
- Identification of surface water usage to be utilised including information on quantities, usage rates, locations of the resource and the measures proposed to minimise impacts on surface water quality and other users of the resource.
- Identification of groundwater resources proposed to be used by the Project, 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 Project on groundwater quality including the potential for interconnection between the target and underlying aquifers.
- Decommissioning of temporary groundwater bores.
- Description of compaction techniques to be used adjacent to and within waterways. In particular, how waterway banks are to be compacted (achieving bank stability) without hindering the re-colonisation of riparian vegetation.
- A program for monitoring rehabilitation success at the pipeline sites adjacent to or across waterways. This program must continue for an adequate period to ensure that such works/rehabilitation withstand the natural flow regimes of the region.
- Description of any potential impacts or risk of impacts on groundwater dependent aquatic or terrestrial features. Measures to avoid or mitigate any impacts should be

described. Comment should be made on the likely success of decommissioning groundwater bores that could affect sensitive features.

3.6 AIR ENVIRONMENT

3.6.1 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 Queensland EP Act and Queensland *Environmental Protection (Air) Policy 1997*. Proposed actions potentially affecting air quality should be considered in the context of requirements of the NT *Waste Management and Pollution Control Act 2003*.

3.6.2 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 existing air quality from vehicle emissions and dust generation along haulage routes.
- Impacts on air quality from gaseous emissions including carbon monoxide (CO), oxides of nitrogen (NO_x) from the compression facilities, accidental and planned gas releases, greenhouse gas emissions and ozone depleting substances. For the Northern Territory component of the pipeline, consideration should be given to the NT *Environmental Impact Assessment Guide - Greenhouse Gas Emissions*.
- Amelioration or mitigation measures for each identified impact relating to vehicle emission, dust generation and gaseous emissions should be proposed.
- An assessment of the type and volume of greenhouse gases emitted by the Project during construction and operation and the measures taken to reduce emissions in line with national and state abatement policies and guidelines.

3.7 WASTE

3.7.1 Waste Generation

The EIS should identify and describe all sources of waste associated with construction, operation and decommissioning of the pipeline. This section should 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), including wastes generated from abrasive blasting, and a description of how these wastes will be managed by the Project.
- Any waste treatment process involved.
- Selection criteria for the site selection of waste storage and/or disposal.
- Hazardous materials to be stored and/or used on-site, including environmental toxicity data and biodegradability for raw materials and final products.
- Descriptions should also include (using maps and plans as appropriate):
 - 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 would be produced.
- The storage of any contaminated water, particularly condensate or oily wastewater from compressor stations. If evaporation ponds are to be used, their maintenance and decommissioning should be described. An evaluation should also be made to determine if any ponds or dams trigger regulation by the EPA as dams containing hazardous wastes.
- The proposed method of disposal and extent of use of local government facilities (i.e. Council Sewerage works or mobile sewerage facilities).

3.7.2 Waste Management

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

3.8 NOISE AND VIBRATION

3.8.1 Description of Environmental Values

Sensitive noise receptors adjacent to the pipeline route and compressor station 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.

3.8.2 Potential Impacts and Mitigation Measures

The following analysis of noise impacts should be assembled:

- The levels of noise generated during construction and operation of the compression facilities, pipeline and ancillary activities (e.g. access roads, camp sites) should be assessed against current typical background levels. Anticipated noise levels, their timing and duration, should be considered in conjunction with the sensitivity of receptors.
- 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 and underwater receptors such as cetaceans.
- Proposals to minimise or eliminate these effects should be provided, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise.
- Identification of sections of the route where blasting may be required including discussion of procedures for trench construction and pipe-laying if rock is encountered and the impacts of blasting.
- Assessment should be made of the potential emission of low-frequency noise (noise with components below 200Hz) from major items or plant or equipment and, if necessary, measures should be described for reducing the intensity of these components.

3.9 TRANSPORT AND ACCESS ARRANGEMENTS

3.9.1 *Transport Methods and Routes*

The EIS should discuss transport methods and routes for delivering compression 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.
- Modes of transport (e.g. sea, rail, road) and the type of vehicles most likely to be used for the construction and operational phases and analysis of all aspects of the transport task.
- 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 routes proposed (with the use of maps).
- Existing traffic volumes on the proposed transport routes.
- Details of over-dimension, excess mass loads or any hazardous goods.
- Timing and duration of transport.

The EIS should clearly and fully describe transport information for all stages of the Project including:

- All requirements for the construction, upgrading or re-location of any transport-related infrastructure, including any need for increased road maintenance.
- Any new access requirements to State-controlled or local government roads.
- Full details of where the pipe alignment crosses or runs within or close to road and rail reserves.
- Sufficient details to allow the Queensland Department of Main Roads (DMR) and Queensland Transport to ascertain compliance with legislative and design requirements.
- For the marine component, details of mechanisms to have the pipeline noted by relevant authorities as a marine hazard on nautical maps.

3.9.2 *Potential Transport Impacts and Mitigation Measures*

Assessment of impacts and mitigation measures for transport infrastructure and operations for the entire alignment should be discussed with reference to the Queensland *Transport Infrastructure Act 1994*, the *Transport Planning and Coordination Act 1994*, and the *Transport Operations (Road Use Management) Act 1995*. The following items should be addressed:

- 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, tonnages, and origin and destination details for haulage on each major transport route.
 - 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 rural 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, including:
 - Site depot location and access.
 - Construction traffic on local road networks, daily movement patterns and emergency access, especially in rural 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.
- Assessment of the impact of the construction activities on commercial shipping.

Findings of studies and road infrastructure impact assessments should be incorporated into a draft road use management plan. Transport and road management issues should be addressed in the strategic EMP (see section 4.0).

Reference should be made to any relationship between Project road works and works proposed in the current Road Implementation Program(s) of Queensland DMR, or the NT Department of Planning and Infrastructure (NT DPI). Road infrastructure impacts should be described and assessed according to Queensland DMR's *Guidelines for Assessment of Road Impacts of Development Projects (Nov 2000)*. Reference should be made to other Queensland DMR or NT DPI planning documents.

3.10 CULTURAL HERITAGE

3.10.1 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 should be undertaken to describe Indigenous and non-Indigenous cultural heritage sites and places, and their values, and include:

- Consultation with:
 - The Heritage Division of DEH concerning sites on the Register of the National Estate and any other relevant matters.
 - The Queensland EPA regarding the Queensland Heritage Register, the NT Heritage Conservation Services regarding the NT Archaeological Resources Database and other information regarding places of potential non-indigenous cultural heritage significance.
 - The Queensland Department of Natural Resources, Mines and Water regarding the Indigenous Site Database, and the NT Aboriginal Areas Protection Authority regarding Aboriginal Sacred Sites and permit requirements.
 - The Museum and Art Gallery of the Northern Territory's Maritime Archaeology section regarding the NT Shipwreck 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/organisations (eg local historical societies) concerning:
 - Places of non-Indigenous cultural heritage significance.
 - Opinion regarding significance of any cultural heritage places located or identified.
- Locations of culturally 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.
 - Ship wrecks.
- 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 *Queensland Aboriginal Cultural Heritage Act 2003*, the *NT Heritage Conservation Act 1991*, *Northern Territory Aboriginal Sacred Sites Act 2006*, the *NT Historic Shipwrecks Act 1976* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, to protect areas and objects of cultural heritage significance.

3.10.2 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 non-Indigenous or Indigenous cultural heritage values, including but not limited to the following:

- Description of 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. The CHMP should be based on information contained in the cultural heritage study report and/or information from Indigenous community/communities. The CHMP should be developed and implemented with the direct involvement of Indigenous people. The CHMP should include the following:

- A process for including Indigenous communities associated with the proposed pipeline route in ongoing protection and management of Indigenous cultural heritage.
- Processes for mitigation, management and protection of identified cultural heritage places and material along the proposed 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 *Queensland Aboriginal Cultural Heritage Act 2004*, the *NT Heritage Conservation Act 1991* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

3.11 SOCIAL AND ECONOMIC ENVIRONMENT

3.11.1 Description of Environmental Values

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

- Structure of potentially affected communities in the study area.
- A description of the socio-economic characteristics of the region, including a prediction of trends in the use and management of the pipeline over the expected operational life of the project.
- 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 skills or occupations and availability during both construction and operational stages.
 - Accommodation type, quantity and availability (as it relates to the need for accommodation of the Project construction and operation workforce).
 - 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. Consultation with local Aboriginal people should take place in order to reach agreement about how related social and environmental matters are assessed and reported on within the EIS.
- Economic base and economic activity.

3.11.2 Potential Impacts and Mitigation Measures

The social and community impacts of the proposed development should be addressed as part of the EIS incorporating any assessment of stakeholder concerns about adverse impacts to the natural, social, economic or built environment so that appropriate mitigation strategies can be developed. Relevant strategies and resources that will be committed to address all expected impacts should be outlined. The EIS should outline how potential impacts on rural land users, affected landowners and communities, public health, safety, transport, accommodation, and local human services will be mitigated. Consideration 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 and operational phases, and after decommissioning.
- Strategies to minimise access requirements for operation and maintenance activities.
- The potential and mechanisms for local communities and businesses 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.
- 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.
- Impact of accommodation requirements during construction and operation stages on communities along the pipeline route.
- The potential of the Project to impact adversely on the existing supply of rental housing at locations along the route should be assessed.
- Any impacts (positive or negative) on the local and regional housing construction sector, 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.
- A breakdown of skills/trades required, including specific opportunities for skills development that may be of benefit to the local community, following installation of the pipeline.
- Opportunities for facilities and infrastructure development that may be of benefit to the local community, following installation of the pipeline.
- The value of the proposed pipeline and associated infrastructure in terms of the potential to provide alternative gas supply to other gas customers and to act as a conduit for other services.
- Negative impacts or potential synergies with existing land uses.
- 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)* and the NT *Workforce Employment and Training Strategy*.
 - Indigenous employment opportunities - *Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects (the 20% Policy)* and the NT *Indigenous Employment & Career Development Strategy 2002-2006*.
 - The use of locally sourced goods and services – *Department of State Development, Trade and Innovation 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/territory and national economies in terms of direct and indirect effects on employment and skills development, income, regional and Indigenous economic development, supply of goods and services and production.
- The cumulative impact on skilled labour of other projects, current and proposed in the communities which lie alongside the pipeline route.
- The value of the pipeline construction, highlighting proportion to be spent in Queensland and the Northern Territory, particularly Weipa and Nhulunbuy.
- The socio-economic indicators that will be monitored on an ongoing basis.

3.12 HAZARD AND RISK

3.11.1 Hazard Analysis

This section of the EIS should describe the potential hazards and risks that may be associated with the Project. A preliminary hazard analysis should be conducted for the Project in accordance with the *Hazardous Industry Planning Advisory Paper No. 8 – “HAZOP Guidelines” NSW Department Urban Affairs and Planning* or a similar standard. The preliminary hazard analysis should incorporate:

- Possible frequency of potential hazards, accidents, spillages and abnormal events occurring during all stages of the Project.
- Indication of cumulative risk levels to surrounding land uses.
- Identification of all hazardous substance to be used, stored, processed or produced and the rate of usage.
- Evaluation of pipeline exposure and vulnerability to damage from ship anchors, fishing trawl nets or other potential hazards.
- Potential wildlife hazards such as snakes and disease vectors.
- An overview of the objectives and management principles to be adopted for the preparation of a detailed emergency plan (including emergency response and recovery/cleanup procedures) in consultation with the relevant emergency services.

3.12.2 Risk Assessment

- The Proponent should carry out a risk assessment in accordance with *AS 2885 Gas and Liquid Petroleum Pipelines* and the guidelines of the responsible authority, where relevant.
- The EIS should deal comprehensively with on-site risks. External risks to the Project should also be considered. External risks from natural hazards could be determined on the basis of *AS/NZS Risk Management Standard 4360:1999*.
- The study should assess risks during the construction, operational and decommissioning phases of the pipeline. These risks should be assessed in quantitative terms where possible.
- The study should assess and describe possible hazards, accidents, and abnormal events that may arise for the Project, both during construction and in operation, including:
 - Accidental release of gas or other materials. This information should include:
 - the quantity of gas or other materials that would be released;
 - the area affected by the gas, under a range of likely gas flow and underwater pipeline depth conditions, including no flow up to the expected maximum flow; and
 - the approximate time scale for removal of gas by natural processes.
 - Explosions and fires associated with incidents arising from the compression facilities and pipeline with an indication of the potential scales of impact.
 - Seismic stability of the pipeline route.
 - Vulnerability of the route to flooding, bushfire, and landslip.
 - Vulnerability of the operational pipeline to attack by terrorist / military forces.
- Analysis of the consequences of each of these events on safety and environmental damage in the Project area should be conducted, particularly in the vicinity of the pipeline, including:
 - Injuries and death to workers and to the public.
 - Direct harm to the environment as a result of pipeline hazards.
- The analysis should examine the likelihood of these consequences being experienced, both individually and collectively.
- Details should be provided on the safeguards that would 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. The information should include the reduced level of risk that would be experienced with these safeguards in place.

- A comparison of assessed and mitigated risks with acceptable risk criteria for land uses adjacent to the pipeline route locations should be presented.

3.12.2 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. Emergency and safety management should be addressed in the strategic EMP (see section 4.0).

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.

4. Environmental Management Plans

This section of the EIS should present environmental management plans (EMPs) developed for the Project. It is expected that all EMPs will be prepared in accordance with the Queensland EPA Guideline: *Preparing Environmental Management Plans* and should also be prepared in accordance with the draft Guideline: *Preparing an Environmental Management Plan for Level 1 Petroleum Activities*. Separate EMPs should individually address the discrete Project elements. The EMPs should be developed from the preceding information in the EIS.

An EMP should provide life-of-proposal control strategies in accordance with agreed performance criteria for specified acceptable levels of environmental harm. In addition, EMPs should identify:

- Potential impacts on environmental values;
- Mitigation strategies;
- Relevant monitoring;
- Appropriate indicators and performance criteria;
- Reporting requirements; and
- Appropriate corrective actions, should an undesirable impact or unforeseen level of impact occur.

The aims of an EMP are to provide:

- Commitments by the Proponents to practical and achievable strategies and design standards (performance specifications) for the management of the Project to ensure that environmental requirements are specified and complied with;
- An integrated plan for comprehensive monitoring and control of impacts;
- Local, State and Commonwealth authorities, stakeholders and the Proponents with a common focus for approvals conditions and compliance with policies and conditions; and
- The community with evidence that the environmental management of the Project is acceptable.

The structure of each element of the EMP should reflect the objectives of the Queensland EPA Guideline: *Preparing Environmental Management Plans* and the draft Guideline: *Preparing an Environmental Management Plan for Level 1 Petroleum Activities*.

An EMP should commit to manage, enhance or protect identified environmental values. The commitments should contain the following components for performance criteria and implementation strategies:

- Environmental protection objectives for enhancing or protecting each relevant value;
- Indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved;
- Environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective; and
- An action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
 - Continuous improvement;
 - Environmental auditing;
 - Monitoring;
 - Reporting;
 - Staff training; and
 - A decommissioning program for land proposed to be disturbed under each relevant aspect of the proposal.

5. Conclusions and Recommendations

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

6. References

All references used in the preparation of the EIS should be presented in a recognised format such as the Harvard standard (refer to the Style Guide, Australian Government Publishing service). This standard lists references by presenting in the following order: author (date of publication) title, publisher, and place of publication.

7. Recommended Appendices

7.1 Final Terms of Reference

The finalised Terms of Reference should be included as an Appendix to the EIS.

7.2 Development Approvals

A list of the development approvals required by the Project should be provided.

7.3 Consultation Report

A list of advisory agencies should be provided in a summary Consultation Report, which should also list the Australian, State and Local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

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

Information about identifying affected parties (as defined by the EPBC Act) and interested and/or affected persons (as defined by the Queensland EP Act) should be included.

7.4 Study Team

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

7.5 Technical Data and Baseline Studies

Relevant supporting data and information generated from specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- Geology;
- Soil survey and land suitability studies;

- Land use and land capability studies;
- Waterway hydrology and groundwater;
- Flora and fauna studies, including the subregional analysis of representativeness and adequacy of protection for the terrestrial/riparian vegetation communities and their component flora and fauna taxa within the affected areas;
- An integrated assessment of relative biodiversity/conservation values, based on the methodology outlined in *Biodiversity Assessment and Mapping Methodology (Queensland EPA 2002)*;
- Air pollution, noise and vibration;
- Transport and traffic studies;
- Economic studies and/or cost-benefit analyses; and
- Hazard and risk studies.

7.6 List of Proponent Commitments

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

Attachment 1: The Objects of the *Environment Protection and Biodiversity Conservation Act 1999*

Objects of the Act

- (a) To provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;
- (b) To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- (c) To promote the conservation of biodiversity;
- (d) To promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;
- (e) To assist in the co-operative implementation of Australia's international environmental responsibilities;
- (f) To recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- (g) To promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in co-operation with, the owners of the knowledge.

3A. Principles of Ecologically Sustainable Development

The following principles are principles of ecologically sustainable development:

- (a) Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
- (b) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- (c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- (d) The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and
- (e) Improved valuation, pricing and incentive mechanisms should be promoted.

Attachment 2: Matters that must be addressed in an EIS (Schedule 4 of the *EPBC Act Regulations 2000*)

1. General Information

The background of the action including:

- (a) The title of the action;
- (b) The full name and postal address of the designated proponent;
- (c) A clear outline of the objective of the action;
- (d) The location of the action;
- (e) The background to the development of the action;
- (f) How the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;
- (g) The current status of the action; and
- (h) The consequences of not proceeding with the action.

2. Description

A description of the action, including:

- (a) All the components of the action;
- (b) The precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;
- (c) How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;
- (d) Relevant impacts of the action;
- (e) Proposed safeguards and mitigation measures to deal with relevant impacts of the action;
- (f) Any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;
- (g) To the extent reasonably practicable, any feasible alternatives to the action, including:
 - (i) If relevant, the alternative of taking no action;
 - (ii) A comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action;
 - (iii) Sufficient detail to make clear why any alternative is preferred to another;
- (h) Any consultation about the action, including:
 - (i) Any consultation that has already taken place;
 - (ii) Proposed consultation about relevant impacts of the action;
 - (iii) If there has been consultation about the proposed action — any documented response to, or result of, the consultation; and
- (i) Identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3. Relevant Impacts

Information given under paragraph 2(d) must include:

- (a) A description of the relevant impacts of the action;

- (b) A detailed assessment of the nature and extent of the likely short term and long term relevant impacts;
- (c) A statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
- (d) Analysis of the significance of the relevant impacts; and
- (e) Any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4. Proposed Safeguards and Mitigation Measures

Information given under paragraph 2(e) must include:

- (a) A description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;
- (b) Any statutory or policy basis for the mitigation measures;
- (c) The cost of the mitigation measures;
- (d) An outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;
- (e) The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and
- (f) A consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5. Other Approvals and Conditions

Information given under paragraph 2(f) must include:

- (a) Details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:
 - (i) What environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy;
 - (ii) How the scheme provides for the prevention, minimisation and management of any relevant impacts;
- (b) A description of any approval that has been obtained from a State, Territory or Australian Government agency or authority (other than an approval under the Act), including any conditions that apply to the action;
- (c) A statement identifying any additional approval that is required; and
- (d) A description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6. Environmental Record of Person Proposing to Take the Action

Details of any proceedings under an Australian, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- (a) The person proposing to take the action; and

- (b) For an action for which a person has applied for a permit, the person making the application.

If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7. Information Sources

For information given, the EIS must state:

- (a) The source of the information;
- (b) How recent the information is;
- (c) How the reliability of the information was tested; and
- (d) What uncertainties (if any) are in the information.

Attachment 3: Guidelines for Greenhouse Gas Emissions

The Australian Government seeks transparent and accurate information to support decision making. This framework is provided to assist proponents in detailing the greenhouse implications of development proposals. To aid assessment of greenhouse gas emissions resulting from the proposed PNG Gas Pipeline Project – Gove Lateral development, the following information is required:

1. Inventory of Annual Emissions

The proponent must provide data on maximum annual emissions of the six greenhouse gases listed in the Kyoto Protocol (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride). This includes both emissions on-site and upstream, such as from the production and supply of natural gas to the proposed development.

The inventory should include:

- (a) An estimate of emissions on a gas by gas basis;
- (b) A summary table of emissions on a gas by gas basis;
- (c) A summary table listing emissions on a carbon dioxide equivalent basis; and
- (d) A table which includes gross emissions, emission reduction due to both offsets and mitigation, and net emissions.

2. Mitigation

The proponent must include a full description of mitigation measures, including analysis of a full range of alternatives to the proposed project. This should include methods by which greenhouse gas emissions could be mitigated, including:

- (a) Analysis of the likely greenhouse gas reductions as a result of mitigation efforts (to the same level of detail as described in the section 1.1 above);
- (b) Analysis of costs, both financial and output related, of mitigation; and
- (c) Identification of any relevant voluntary partnerships between government and the proponent; such as Greenhouse Challenge and their links to mitigation.

In (a) and (b) above, the proposed geological sequestration of carbon dioxide should be fully described and an analysis of the risks associated with the sequestration proposal, including the likelihood and consequences of failure of the proposal to meet expected objectives, presented.

3. Methodologies

The proponent must identify, in a transparent manner, the methodology used in making the estimate. In preparing estimates:

- (a) The most recent National Greenhouse Gas Inventory (NGGI) methodology should be used (<http://www.greenhouse.gov.au/inventory/index.html>); or
- (b) If the relevant industry is not covered by the NGGI methodology, Intergovernmental Panel on Climate Change (IPCC) methodology should be substituted (<http://www.ipcc.ch/pub/guide.htm>); or

- (c) If no methodology exists in either format, a methodology reflecting the principles of the NGGI and IPCC will be developed and agreed by the proponent and the Australian Greenhouse Office.

4. Supporting Data

The following supporting data must be provided:

- (a) The proponent must provide details on the emission factors used, and an explanation where a proponent chooses to use alternative emission factors to that provided in the methodology.
- (b) The project's emission factors need to be compared with similar projects, including both Australian and international best practice. This analysis should include projects that use alternative fuel sources, processes, and technologies.

5. Offsets

The proponent should provide information on the range of offsets (eg sinks or off-site energy efficiency measures) that may be pursued. The following information should be provided:

- (a) Likely greenhouse gas reductions as a result of the offsets (to the same level of detail as described in the inventory section above);
- (b) Description of proposed offsets and a qualitative assessment of their impact on other matters of environmental, economic, or social significance; and
- (c) Analysis of costs, both financial and other related to offsets.