APPENDIX A
Guidelines for Public Environment Report (PER)

PART A

INFORMATION FOR THE PUBLIC

GUIDELINES FOR PREPARATION OF A PUBLIC ENVIRONMENTAL REPORT

BONAPARTE GAS PIPELINE

Australian Pipeline Trust Group

October 2006

TABLE OF CONTENTS

1 PURPOSE 1

2 THE PROPONENT 1

3 DESCRIPTION OF PROPOSAL 2

3.1 INTRODUCTION 2
3.2 ROUTE 2
3.3 LAND USE 2
3.4 GEOLOGY 3
3.5 RESOURCES 3
3.6 PROPOSED INFRASTRUCTURE 3
3.7 CONSTRUCTION PROCESS 4
3.8 ACCESS TO CONSTRUCTION CORRIDOR 4
3.9 WORKFORCE 4
3.10 ABOVE GROUND FACILITIES 5
3.11 OPERATION AND MAINTENANCE 5

4 PER PROCESS 6

5 ADMINISTRATION 6

File Path:
\\Dwnplzfps01\business\3 E&H\3-1 Environment\3-1--2 Assessments\Bonaparte Gas Pipeline\Assessment Guidelines\Part A - PER Guidelines Bonaparte Gas Pipeline.doc

1 PURPOSE

The Northern Territory Minister for Natural Resources, Environment and Heritage has determined that this proposal requires assessment under the *Environmental Assessment Act* at the level of a Public Environmental Report (PER).

The proponent has also referred the project to the Australian Government under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act). The Australian Government has determined the proposal is a controlled action under the EPBC Act. The controlling provisions for the proposed action are: sections 18 and 18A (Listed threatened species and communities); and sections 20 and 20A (Listed migratory species). The project will be assessed under a bilateral agreement between the Australian Government and the Northern Territory Government.

These guidelines have been developed to assist Australian Pipeline Trust Limited in preparing a PER for the proposed Bonaparte Gas Pipeline in accordance with Clause 8 of the Administrative Procedures of the *Environmental Assessment Act*. The object of these guidelines is to identify those matters that should be addressed in the PER. The guidelines are based on the initial outline of the proposal in the Notice of Intent (NOI).

These guidelines consist of two sections:

- Part A (this section) is the introduction and brief description of the project and the PER process; and
- Part B details the type and extent of information to be included in the PER.

The object of these guidelines is to identify those matters that should be addressed in the PER. The guidelines are based on the initial outline of the proposal in the proponent's NOI. The guidelines, however, are not necessarily exhaustive. They should not be interpreted as excluding from consideration any matters which are currently unforeseen that emerge as important or significant from scientific studies or otherwise during the preparation of the PER and the public consultation process.

This section of the guidelines has been developed to assist members of the public and other interested parties in preparing comments on the PER.

2 THE PROPONENT

The proponent is Sydney-based Australian Pipeline Trust Group.

3 DESCRIPTION OF PROPOSAL

3.1 Introduction

The Australian Pipeline Trust (APA) proposes to construct and operate the Bonaparte Gas Pipeline (BGP) from Wadeye to Ban Ban Springs, a distance of approximately 275 km. The BGP will be a high pressure gas pipeline that will connect to the Amadeus Basin to Darwin Gas Pipeline (ADP).

The Power and Water Corporation (PWC) has negotiated an agreement with Eni Australia Pty Ltd (Eni) to source replacement gas supplies, from the Blacktip field located offshore in the Bonaparte Gulf, for existing power generation assets in the Northern Territory. The BGP will transport treated natural gas from the Eni Blacktip Gas Plant to supply fuel for the Northern Territory's power supply. The current gas supplies from the Amadeus Basin, west of Alice Springs, will begin to decline in 2008 and are unable to provide future supplies to Darwin. The pipeline, which will initially be capable of delivering 30 PJ/year, will consist of a buried high tensile steel pipe located in a 30 metres wide corridor. Above ground facilities at intervals along the pipeline route are likely to include an inlet station at the Blacktip Plant, a scraper station and up to 6 mainline valves along the pipeline and a regulator and meter station at the ADP connection point. Provision will be made in the design and land agreements to facilitate a future compressor station to allow for expansion of pipeline capacity over time. These future compressor stations would be at the same location as the scraper stations.

Eni are the owner/operator of the Blacktip offshore gas field. Eni will develop the offshore gas production facilities and construct a pipeline to transport the gas from the offshore platform to the gas processing plant at Wadeye. The environmental assessment undertaken for the Woodside Blacktip development has been transferred to Eni for the offshore pipeline and Wadeye gas processing facility.

3.2 Route

The proposed route of the Bonaparte Gas Pipeline commences near Wadeye which lies near the coast of the Bonaparte Gulf. The pipeline generally follows the Wadeye to Daly River township road for approximately 130km, then crosses the Daly River upstream of the Causeway. The pipeline then heads east-north-east to a point generally in the vicinity of the Dorat Road and Douglas Hot Springs Road intersection and thereafter generally parallels the existing Cosmo Howley mine pipeline to the Amadeus Basin to Darwin Pipeline connection.

3.3 Land Use

Land use along the proposed route comprises of approximately 130km of Aboriginal freehold land, approximately 2km of government reserve and approximately 143km of pastoral leasehold and various road tenures.

3.4 Geology

The geology of the route comprises features of great age as well as recent dynamic landforms. The antiquity reflects the stability of the Top End and explains the deeply weathered, strongly leached and infertile soils of many regions. The dominant rock type along the alignment is sandstone. The two main river basins traversed in the proposed route are:

Moyle River Basin (KP000-120)
The rock types consist of sandstone, siltstone and claystone sediments of the Upper Permian Hyland Bay Formation. An impervious claystone at a depth of 50 to 100 metres marks the base of the sandstone. A high yielding, widespread shallow aquifer system underlies the BGP corridor in the vicinity of the Wadeye community. Bore yields are inconsistent and vary between 0.5 and 22 L/s but commonly are between 5 and 10 L/s. Higher yielding bores are associated with fracturing or a local source of recharge. The water quality is usually good.

Daly River Basin (KP120-270)
The Daly basin was formed in the Cambrian period and consists of limestone and sandstone formations, overlain by Cretaceous sediments. The area is characterised by three types of fractured, karstic rocks known as Tindal limestone (limestone and siltstone), Oolloo limestone (dolomitic sandy limestone) and the Jinduckin Formation (a mixture of limestone, siltstone and shale). All three rock types contain extensive unconfined aquifers that serve as the primary groundwater resources in the area and, as a result, provide the base flow of the majority of the rivers and creeks in the Daly basin and have a very important role in wetland hydrology and river flow in the Daly basin.

3.5 Resources

The BGP will initially have the capacity to transport 30PJ of gas per annum with a design life of 42 years. The pipeline will be designed to provide for increased flow rates through future compression and with on-going integrity management the operational life of the pipeline would be expected to be well in excess of 50 years.

3.6 Proposed Infrastructure

Subject to Basic Engineering, the BGP is expected to be constructed using 323.9 mm diameter, 5 L X70 high tensile steel pipe with a Maximum Allowable Operating Pressure (MAOP) of 15300 KPa. The inlet station adjacent to the ENI gas processing plant will consist of a pipeline inspection tool launcher and isolation valves. The interconnection with the 323.9 mm (12 inch), 9650 KPa MAOP ADP will consist of a meter and regulator station. The branch tee intersection will be completed using the hot tap technique.

It is proposed that the high-tensile pipeline will be buried within a 30 metres wide corridor. Whilst Northern Territory legislation provides for a 25m corridor the APA will be seeking a 30m construction corridor on the basis of safety and environmental benefits. The proposed pipeline will be designed and constructed in accordance with the current versions of AS2885 Pipelines- Gas and Liquid Petroleum. This standard

covers the design, construction, operation and eventual abandonment of the pipeline. AS2885 calls up in excess of 80 Australian, American and European standards in accordance with which the pipeline and facilities must be designed.

3.7 Construction Process

Pipe will be supplied to the construction site in pre-coated lengths which will be welded together onsite, the joints field coated and the pipeline buried. Depth of cover will vary depending on the conditions of the terrain, the surrounding land use and the threats to the pipeline at that location (e.g. 750mm in rock, 1200mm in cultivated land). The pipeline corridor will be marked out by surveyors, cleared and graded (including extra workspace and truck turning bays) and the trench centreline pegged, ahead of the trenching. Pipe stringing and bending will follow. Once sufficient pipe has been strung and bent, the welding, non-destructive testing (NDT) and joint coating processes will commence. After welding has progressed for a distance, the pipe will be lowered into the trench followed by trench back-fill. The corridor will then be reinstated and cathodic protection test points and pipeline warning marker signs installed.

Construction is a sequential activity with each crew progressing at approximately 3-5km per day (depending upon the terrain) with approximately 4-7 working days between crews. Reinstatement of the first stages of the pipeline corridor will therefore be likely to commence approximately 2-3 months after the start of construction. Installation of the main line valve facilities, as well as any special road, rail and watercourse crossings are likely to be carried out concurrently with the main pipeline construction.

Depending on the overall logistics and ground conditions special crossing crews, including horizontal directional drilling (HDD), boring and watercourse crossings, may be dispatched prior to main line construction. In this way the crossings will be completed and ready for tie-in when the main line welding crew reaches them.

In general, as specialist crews complete their activities, they will be demobilised from the field.

3.8 Access to construction corridor

During construction, access will be required along the construction corridor and to the campsites, water bores and, if required, any borrow pits. The Stuart Highway will be the principal access route to the Project area; thereafter the majority of the heavy equipment will be transported along existing, mainly gravel, roads.

3.9 Workforce

The workforce will comprise approximately 200-250 personnel during peak construction who will be accommodated in construction camps along the route. The construction camps will include sleeping, catering, maintenance, first aid and administration facilities. Typically there would be a main camp comprising all facilities and a smaller camp. Sleeping facilities would be moved from the main camp

to the smaller camp as the crews progress along the construction corridor until the smaller camp becomes the main camp. It is anticipated that this movement of camps will take place only once (i.e. two campsites in total).

3.10 Above ground facilities

Above ground facilities will comprise:

- Meter Station
- Up to 6 Main Line Valves
- Scraper stations/ future compressor station
- Markers signs (such as pipeline and anode bed signs.)
- Cathodic Protection Posts
- Power supplies including cathodic protection, transformers and rectifiers
- Communication facilities

3.11 Operation and maintenance

Given that the pipeline will be underground, land users are able to resume previous land use activities on top of the pipeline provided that the use does not include excavation activities. Whilst deep-rooted vegetation cannot be re-established directly across the pipeline (due to the potential damage to the pipeline) shallow root cropping and grassland re-establishment is encouraged and no long-term impacts would be expected to such areas. Typical operational activities are:

General Operations - The routine operation and maintenance program includes ground and aerial patrols, repair of equipment, pigging and internal cleaning of the pipeline, corrosion monitoring and remediation, sapling removal from the immediate vicinity of the pipeline and easement and lease area maintenance including access roads. Aerial and/or ground inspections will include detection of third party activities on or near the pipeline easement, detection of erosion, monitoring of rehabilitation success and detection and control of weed species.

Supervisory Control and Data Acquisition System (SCADA) - The pipeline will have a SCADA system which will continually monitor pipeline conditions such as pressure, temperature, gas flow in and out, linepack, valve status, cathodic protection and gas quality. All information will be relayed back to the central control room located in Darwin. The SCADA system will enable the pipeline controller to instantly open or close valves, alter operating pressures and start or stop equipment as required at sites on the pipeline.

Prevention of Pipeline Damage - Prevention of damage due to third party activity will be achieved through appropriate depth of cover, signposting of the pipeline, one call "Dial Before You Dig" programs, regular inspection of the pipeline route to spot any construction or earthmoving activities in the area, and third party education on the potential dangers of carrying out activities in proximity to the pipeline. A land owner and stakeholder liaison program will be established to disseminate this information. In some areas such as crossings, marker tape or concrete slabs may be buried above the pipeline to reduce risk of third party interference. A risk assessment process, in accordance with AS2885, will be established. Security fencing, gates and locks will

be provided around all major above ground facilities (e.g. scraper stations and mainline valves) to inhibit accidental or unauthorised tampering.

Cathodic Protection - Pipeline corrosion will be prevented by the protective external coating and cathodic protection systems. The cathodic protection system will be checked regularly to ensure that the protection voltages are within required limits and to monitor any likely areas of corrosion activity.

4 PER PROCESS

The proponent has been directed to prepare a PER. Once prepared, the PER will be exhibited for public review and comment for a period of 28 days, during which time advisory bodies will also comment on the document.

Approximately 20 bound copies of the PER will be required for distribution to NT advisory bodies and public viewing locations (eg. Environment Centre NT, Katherine Council Offices and Katherine Library).

Copies of the PER are to be provided to:

- Department of Defence
- Environment Centre NT
- Northern Land Council
- Parks and Wildlife Katherine Regional Office

In addition, 8 CD ROM copies (in ADOBE*.pdf format) plus two unsecured Microsoft Word copies should be submitted (to allow placement on the EPA's Internet site and to facilitate production of the Assessment Report and Recommendations). The proponent should also consider producing at least several copies for direct sale to the public, on request.

Public and government advisory body comments are forwarded to the proponent. The Proponent prepares a Supplement to the PER and submits it to the Minister.

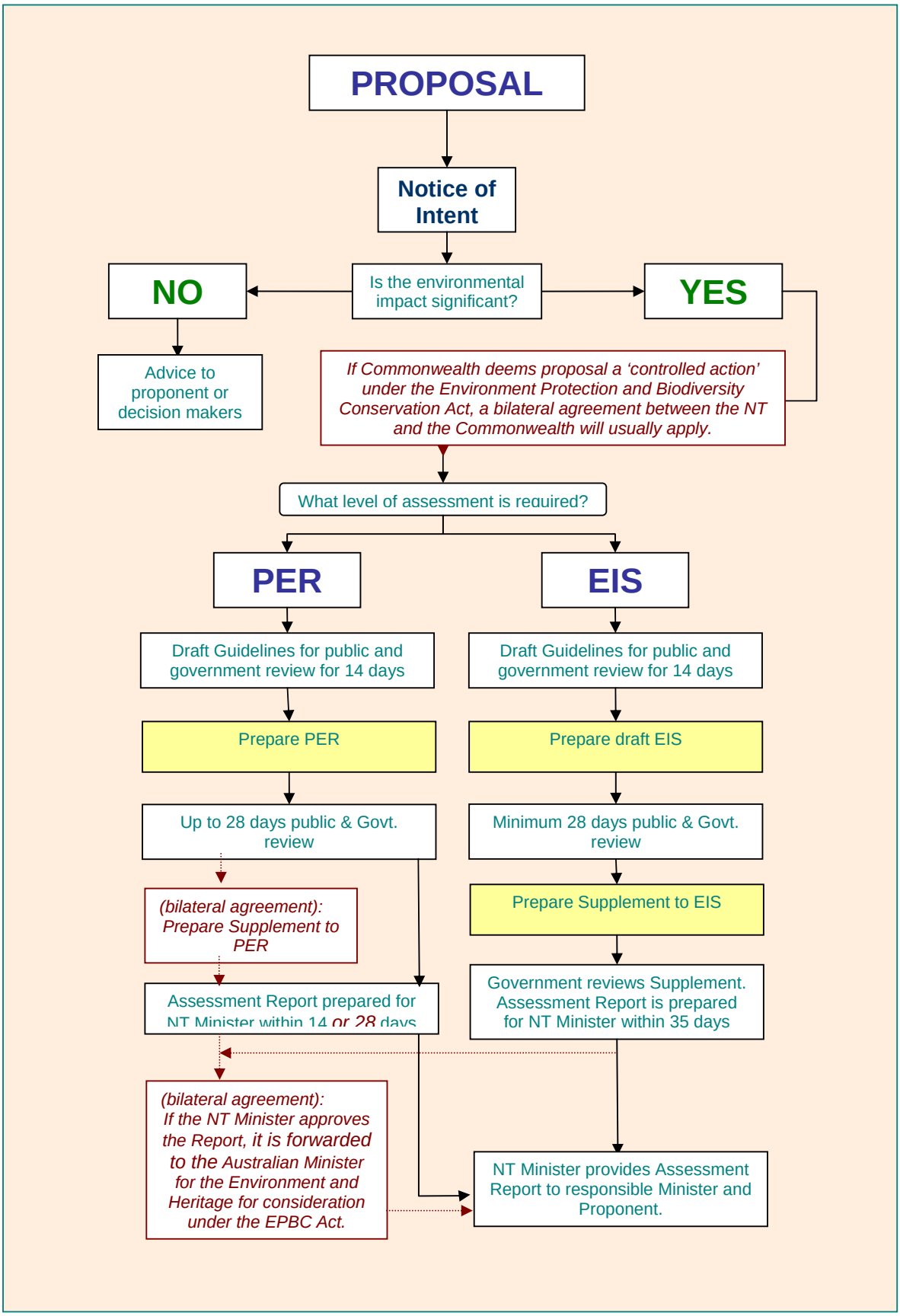
The Environment Protection Agency Program will prepare an Environmental Assessment Report and Recommendations based on the PER, the Supplement and any comments received. If the Minister approves the Report and Recommendations, these are forwarded to the Australian Government Minister for the Environment and Heritage for approval consideration under the EPBC Act. Subject to approval under the EPBC Act, the Report and Recommendations are then forwarded to the responsible (consent) Minister(s) for inclusion in permit, lease or license conditions and in relevant management procedures (e.g. Mining Management Plans).
The Assessment Report and Recommendations are included on the Environment Protection Agency Program's webpage and hard copies are provided to respondents and selected public libraries and viewing sites.

5 ADMINISTRATION

The nominated Action Officer for this project is Mr Michael Brown from the Environment Protection Agency Program, Department of Natural Resources, Environment and the Arts. The contact telephone number is (08) 8924 4020 and facsimile number (08) 8924 4053, e-mail: michael.brown@nt.gov.au .

Copies of the final guidelines will be posted on the DNRETA website at
http://www.nt.gov.au/nreta/environment/assessment/register
Copies of the PER will be available to the public for purchase from the proponent.

Next Page:
Figure 1 The Northern Territory Environmental Assessment Process


PROPOSAL
Notice of Intent
Is the environmental impact significant?
NO
YES
Advice to proponent or decision makers
If Commonwealth deems proposal a 'controlled action' under the Environment Protection and Biodiversity Conservation Act, a bilateral agreement between the NT and the Commonwealth will usually apply.
What level of assessment is required?
PER
EIS
Draft Guidelines for public and government review for 14 days
Draft Guidelines for public and government review for 14 days
Prepare PER
Prepare draft EIS
Up to 28 days public & Govt. review
Minimum 28 days public & Govt. review
(bilateral agreement): Prepare Supplement to PER
Prepare Supplement to EIS
Assessment Report prepared for NT Minister within 14 or 28 days
Government reviews Supplement. Assessment Report is prepared for NT Minister within 35 days
(bilateral agreement): If the NT Minister approves the Report, it is forwarded to the Australian Minister for the Environment and Heritage for consideration under the EPBC Act.
NT Minister provides Assessment Report to responsible Minister and Proponent.

PART B – Contents of the PER

GUIDELINES FOR PREPARATION OF A

PUBLIC ENVIRONMENTAL REPORT

ON THE PROPOSED BONAPARTE GAS PIPELINE

AUSTRALIAN PIPELINE TRUST GROUP

OCTOBER 2006

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1

2 THE PROPOSAL 1

2.1 General Information 1
2.2 Description of the Proposal 2

3 ALTERNATIVES 3

4 EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND ENVIRONMENTAL SAFEGUARDS 4

4.1 Preliminary 4
4.2 Landform features 4
4.2.1 Baseline 4
4.2.2 Impacts 4
4.2.3 Management 5
4.3 Water 5
4.3.1 Baseline 5
4.3.2 Impacts 5
4.3.3 Management 5
4.4 Ecology 6
4.4.1 Baseline 6
4.4.2 Impacts 6
4.4.3 Management 7
4.5 Biting Insects 7
4.6 Air quality & Noise 8
4.6.1 Baseline 8
4.6.2 Impacts 8
4.6.3 Management 8
4.7 Waste Management 8
4.7.1 Baseline 8
4.7.2 Impacts and management 8
4.8 Fire 9
4.9 Greenhouse gas emissions inventory and benchmarking 9
4.10 Socio-Economic 9
4.10.1 Use (land and aquatic) 9
4.10.2 Historic and Cultural Heritage Values 10
4.10.3 Social Environment 11
4.10.4 Economics 12
4.10.5 Infrastructure and Transport 13

5 PROJECT ENVIRONMENTAL MANAGEMENT 14

5.1 Environmental Management System 14
5.2 Resourcing and Policies 14
5.3 Environmental Management Plan 14
5.4 Monitoring and Reporting Strategies 15

6 HEALTH AND SAFETY PROGRAM 16

7 RISK ASSESSMENT AND EMERGENCY MANAGEMENT PLANS 16

7.1 Risk Assessment 16
7.2 Emergency Management Plan 17

8 PUBLIC INVOLVEMENT AND CONSULTATION 17

9 BIBLIOGRAPHY 17

10 GLOSSARY 17

11 APPENDICES 17

The draft Public Environmental Report (PER) should include the following sections but need not be limited to these sections or inferred structure.

1 EXECUTIVE SUMMARY

The Executive Summary should include a brief outline of the project and each chapter of the draft PER, allowing the reader to obtain a clear understanding of the proposed project, its environmental implications and management objectives. The Executive Summary should be written as a stand-alone document, able to be reproduced on request by interested parties who may not wish to read or purchase the draft PER as a whole.

2 THE PROPOSAL

2.1 General Information

The PER must provide detail of the proposed pipeline route (including associated ancillary activity sites), compressor stations and surrounding environment to place the proposal in its local, regional and national context. As a minimum the PER should include the following:

- an explanation of the objectives, benefits and justification for the project;
- meteorological data;
- topography and bathymetry;
- surrounding and proposed land uses (including the location of residential properties, communities and outstations, military reserves or exercise areas, extractive industries, road reserves etc);
- detailed description of the Wadeye community and its outstations;
- description of relevant NT and Local Government planning schemes; local laws; Territory, Australian Government and International policies, legislation and treaties; and other applicable policies;
- identification of any development approvals or infrastructure proposals likely to be required or affected by the proposal;
- how the action relates to any other actions that have been or are being taken or that have been approved in the region affected by the action;
- areas under native title claim and determinations of native title, areas of Aboriginal land, claims over sea/intertidal areas, and areas available for claim;
- substrate (aquatic) and soil (land) types and properties along the pipeline route (including composition, presence of acid sulphate soils, etc);
- ecological information including flora and fauna in both terrestrial and aquatic environments;
- availability of services/ infrastructure and accessibility taking into account seasons; and
- reference to planning issues such as land tenure, zoning, timeframes, potential for additional development and the lifespan of the project.

2.2 Description of the Proposal

The PER should identify all the processes and activities intended for the proposed pipeline (and associated ancillary activities) during the life of the project. This should include details of:

- the value of the gas to be transported to Darwin and the value of construction;
- proposed layout for all operations, including the pipeline. Include the location and/or frequency of spur lines, cathodic protection points, sales taps, compressor stations, control valves (isolation points), and any other Project facilities and linkages to existing gas pipelines;
- other exploration activities proposed for the area and how further production wells will tie-in to the project;
- the pipeline route, easements (including widths and access requirements) and alternative routes.
- all associated ancillary activities, including materials storage areas, access roads, construction camps etc;
- all equipment, production processes and methods intended for the development;
- measures to minimise the potential for third party interference;
- all chemicals, including fuels and the proposed methods for transportation, storage, use and emergency management of these substances;
- project schedule;
- the proposed tenures under which the various components and stages of the project would be held, in particular the granting of proposed tenure on Aboriginal land. Details of any Territory or Commonwealth legislative processes required to grant the proposed tenure should also be discussed;
- waste generation, storage and disposal;
- pipeline case design with regard to relevant Australian Standards and other legislative requirements, and design limitations imposed by site characteristics;
- employment opportunities (directly and indirectly, including Aboriginal people) at the different stages of the Project (construction and operation), likely sources of the workforce and level of skill required;
- the accommodation requirements and arrangements for both construction and maintenance activities and any associated infrastructure and services;
- transport systems, methods and routes for delivering construction and maintenance materials and other necessary goods and consumables including a general description of requirements for upgrading existing transport routes. Information on the use of and impact on port, road, air and rail networks is required for the construction and operational phases; and
- the use and extent of other infrastructure required for the Project, including but not limited to gas, telecommunications and power. This includes details of water supply, source, treatment and usage for both the construction and operational workforce, and pipeline testing.

In addition to the above, further information is required for the construction, operation and decommissioning phases of the project.

- Construction of the pipeline. The PER should provide details of:
    - pipeline case construction, and pipeline laying and stabilisation methods including the plant and machinery likely to be involved. Include details of materials used for construction (including sources, quantities and potential for contaminants);
    - the anticipated timing, duration and progress of construction activities;
    - possible interruption to other activities, eg. interruption to road and/or shipping traffic; and
    - provision and location of service corridors.
- Operation of the pipeline. The PER should provide details of operating, maintenance and safety procedures, including monitoring, provisions for the shutdown of facilities and the pipeline and/or the venting of gas, in the event of leakage of gas, as well as provisions for public safety in such circumstances.
- Decommissioning. The PER should provide details of:
    - decommissioning methodologies and possible future uses of the pipeline and the associated facilities. This should include decommissioning and rehabilitation timetable for both temporary and permanent facilities; and
    - proposed rehabilitation of construction areas, including camp sites and storage areas.

3 ALTERNATIVES

Alternative proposals, which may still allow the objectives of the project to be met, should be discussed, detailing reasons for the selection and rejection of particular options. The selection criteria should be discussed and the advantages and disadvantages of preferred options and alternatives detailed. The potential beneficial and adverse impacts of the alternatives should also be described. A comparative description of the impacts of each alternative on the matters protected by the Controlling provisions (under the *EPBC Act*) for the action. The short-, medium- and long-term advantages and disadvantages of the options should also be considered.

Alternatives to be discussed should include:

- not proceeding with the proposal;
- alternative routes for the pipeline;
- alternative environmental management techniques.

4 EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND ENVIRONMENTAL SAFEGUARDS

4.1 Preliminary

Studies to describe the existing environment should be of a scope and standard sufficient to serve as a benchmark against which the impacts of the project may be assessed over an extended period. Control areas not impacted by the project should be included in proposed studies, and long-term monitoring locations should be established.

This section of the draft PER should include an in-depth description of the areas with the potential to or expected to be impacted by the project or any feasible alternatives and clearly identify, qualify and quantify, where appropriate, those potential environmental impacts. The section should also include an assessment of the level of significance of the impact, be it global, national, regional or local (eg. global and national implications of greenhouse gases and the localised impact of service roads or artificial water bodies). The possibility of remediation should also be discussed. Performance indicators for all potential impacts and remediation efforts should be identified. Environmental Management Plans will need to be developed and implemented in order to minimise and manage impacts associated with the project.

Cumulative impacts should also be discussed including the extent to which the environment is already affected by existing developments and any ongoing associated impacts (e.g. increased traffic, pipeline, maintenance actions). The reliability and validity of forecasts and predictions, confidence limits and margins of error should be indicated as appropriate.

4.2 Landform features

4.2.1 Baseline

- Provide maps of and interpret the regional topography.
- Provide maps of and interpret the regional geology, including seismic stability. Describe geological structures along the pipeline route that are of conservation significance.
- Provide maps of and interpret the regional geomorphology.
- Discuss the soil types and land unit(s) and potential and actual acid sulfate soils in areas likely to be affected by the proposal. Consider dispersion rates and sediment mobilisation.
- Detail the existing level of soil erosion and other disturbances.
- Overlay land resource information (available from NRETA) to assist the management of: acid sulphate soils, and: erosion risk assessment, including slope stability.

4.2.2 Impacts

- Detail the extent and implications of possible impacts to landform features/sites from construction of all project components. Include a discussion of impacts to visual amenity.
- Provide details of limiting properties of soil and substrate types and land units features along the proposed pipeline route relating to erosion, rehabilitation, acid generation or specific management requirements.
- Detail circumstances where blasting will be used in preference over mechanical means. Discuss in relation to sensitive areas and relevant national and NT dangerous goods legislation.

4.2.3 Management

- Discuss measures taken to avoid or minimise the impacts identified in 4.2.2.
- Provide management plans detailing measures to manage potential environmental impacts arising from landform limitations previously discussed.

4.3 Water

4.3.1 Baseline

- Provide a general description of the surface water systems and their hydrology that may be impacted by the pipeline including stormwater systems; natural and artificial catchment systems, drainage lines, wetlands and waterways; and the directions of overland flows.
- Describe the ground water systems that may be intercepted or potentially impacted by construction of the pipeline. Consider potential for groundwater draw don during construction.
- Provide details of the potential locations of pipeline waterway crossings including bed and bank profiles and describe selection criteria for determining the final crossing locations.
- Describe the beneficial uses and environmental values of water resources in the vicinity of the pipeline (eg. Aboriginal landholders, outstations and the Wadeye community). Include a discussion of the resource type (freshwater) and the likely effects that an impact on the resource or impediments to access could have on the respective users, both during construction and operation of the pipeline.

4.3.2 Impacts

- Describe how construction and operation of the pipeline and other project components might impact on the surface and ground water features and parameters described in 4.3.1.
- Provide information on construction techniques and design for pipeline waterway crossings and the potential impacts from their construction and installation.
- Detail the options for the source and management of water for hydrostatic testing and any other construction/ operational water use, together with plans for its reuse, recycling or disposal after use and its possible impacts.

4.3.3 Management

- Discuss measures to ensure the beds and banks of water courses remain stable and protected from the natural forces of erosion as required, incorporating preferred methodologies of relevant Advisory Agencies where practicable particularly where there is to be any disturbance to the bank or bed.
- Discuss measures to safeguard downstream surface and ground water quality including appropriate management of any excavated acid sulphate soils and management of wetland crossings.
- Describe measures to address potential impacts arising from extraction and dewatering of groundwater from the trench.
- Discuss maintenance procedures for the repair of pipeline at river crossings.
- Detail measures for the management of water used for pressure testing and the likely impacts of oxygen scavengers on the receiving environment when disposing of this water. Include measures to prevent the potential to create anoxic conditions in the receiving water body and testing for contaminants in water.

- Detail construction of turkey nest dam if required.
- Outline measures employed to mitigate any impacts to water users that might result from disturbances or access restrictions to water resources in the project area as discussed in 4.3.1.

4.4 Ecology

4.4.1 Baseline

- Describe floral and faunal species (including pest or exotic species) and biological communities (including terrestrial and aquatic) including those of local, regional or national significance, which could be affected by the Project. Flora and fauna should be surveyed and described, taking into account seasonality, with rare, threatened, endangered and listed migratory species identified against relevant Territory and Commonwealth legislation. Species with Indigenous conservation values should also be described. Include survey methodologies in the Appendices.
- Significant vegetation includes:
    - rare, threatened, endangered and regionally restricted species, vegetation types or habitats;
    - communities that are particularly good examples of their type;
    - vegetation types which are outside their normal distribution or have other biogeographical significance;
    - ecologically outstanding areas which have importance beyond the immediate site, eg. wetlands, riparian forests, etc; and
    - vegetation which is the habitat of rare and threatened fauna or has outstanding diversity.
- Specify the extent of clearing required along the pipeline corridor.
- Undertake a targeted survey for species of national, regional and local significance.
- Provide an assessment of statutory obligations under NT legislation (IDCO No. 12 – *Planning Act 1999* and s.38 *Pastoral Land Act 1992*) for permits to clear native vegetation and appropriate timelines to allow for application assessment and approvals.

4.4.2 Impacts

- Discuss the impact of the proposal on species, communities and habitats, including those of local, regional or national significance as described in 4.4.1. Discuss also the implications of these impacts on the Aboriginal use of and access to flora and fauna.
- An assessment should be made 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. The assessment should indicate the significance of these impacts.
- Discuss the effects of pollutants discharged to the environment.
- Discuss the potential for lighting to impact on wildlife.
- Describe the impact associated with any proposed land clearing. Justify why a 30m wide strip will be cleared, when the standard width is 25m. Include estimates of all land clearing including access routes, campsites and truck turning bays. Focus on minimum requirements.
- Discuss the ability of identified stands of vegetation and faunal communities to withstand any increased pressure resulting from the proposal and measures proposed to mitigate impacts.

- Identify pest species/noxious weeds that are likely to occur as a result of activities within the project footprint.
- Discuss the impact of the trenched pit on fauna.

4.4.3 Management

- Discuss ways in which impacts on species, communities and habitats can be minimised (eg minimised disruption to fish passage, timing of works to minimise migratory species disturbance, seasonality of breeding, minimise riparian vegetation disturbance, proposed rehabilitation of in stream and floodplain disturbances, mitigation of lighting impacts).
- Describe the methods for rehabilitating disturbed areas following construction, including revegetation strategies, surface stabilities and aquatic monitoring programs. Include species lists for the ecological communities that will be traversed by the pipeline and where seed/ seedlings will be sourced from for revegetation. Provide an estimation of time to recover, monitoring of rehabilitation and responses to gaps in rehabilitation.
- Discuss measures to minimise wildlife capture and mortality in the open trench, including inspection and collaboration with Commonwealth and Territory wildlife agencies, and Traditional Owners. Identify opportunities to work collaboratively to identify species and return caught animals to the appropriate habitat.
- Discuss the method of managing/minimising the introduction of pests, feral animals, and other exotic flora and fauna species, including machinery hygiene, monitoring and responses/ actions.
- Discuss erosion mitigation in the riparian zone during construction and operation of the pipeline.
- Include a weed management plan in the EMP to cover construction, rehabilitation and operation periods (a weed management plan is required under the NT *Weeds Management Act 2001*). Best practice weed management should be adopted with particular reference to The Australian Pipeline Industry Association APIA code of Environmental Practice.
- A Vegetation Clearing Plan should be developed as part of the Construction EMP. Management of land clearing should be in accordance with The Australian Pipeline Industry Association Inc. (1998) Code of Environmental Practice – Onshore Pipelines.

4.5 Biting Insects

- Discuss the impact of biting midge and mosquito populations as pest and disease vectors on the work force and potential for construction activities to create new sources of biting insects for nearby residents.
- Identify measures to prevent the creation of new mosquito breeding sites in quarries and borrow pits.
- Discuss the study that the Department of Health, Medical Entomology Branch undertook for the Trans Territory Pipeline (Trans Territory Pipeline (TTP) Project Biting Insect Assessment August 2004). In particular consideration should be given to biting insect breeding sites, potential pests and disease problems, mitigation measures and the conclusions.
- Identify measures to prevent construction activities causing impacts on drainage lines which will lead to increases in biting insect species of pest and health significance.
- Discuss the effects of construction activities and disposal of construction wastes on biting insect species of pest and health significance, including measures to prevent increases in these species.

4.6 Air quality & Noise

4.6.1 Baseline

- Sensitive noise receptors adjacent to the pipeline route and relevant ancillary activities, should be mapped and typical background noise levels recorded. The potential sensitivity of such receptors should be discussed. Performance indicators and standards should be nominated for each affected receptor.
- Meteorological information applicable to noise and air quality in the project area should be provided.

4.6.2 Impacts

- Assess impacts of noise generated during construction and operation of the pipeline and ancillary activities against current typical background levels. Anticipated noise levels, their timing and duration, should be considered in conjunction with the sensitivity of the receptor.
- Identify and assess the possible impacts of the following air quality issues resulting from the construction and operation of the pipeline:
  - odour;
  - gaseous emissions;
  - particulate emissions;
  - accidental and planned gas releases; and
  - greenhouse gas emissions and ozone depleting substances.

4.6.3 Management

- Discuss measures that will be used to minimise the impacts of noise assessed in 4.6.2.
- Outline dust suppression initiatives. Discuss and recommend dust suppression strategies and monitoring of dust impacts.
- Outline the measures that will be employed for monitoring and dealing with gas leakages during operations.

4.7 Waste Management

4.7.1 Baseline

- Identify and describe (amount and characteristics) all wastes, their sources and their intended management, associated with construction, operation and decommissioning of all components of the proposal.
- Describe all activities, including chemical and mechanical processes, to be conducted on the construction sites/camps (eg. chemical storage, sewage treatment, power generation, fuel burning, mechanical workshop, diesel storage).

4.7.2 Impacts and management

- Discuss the treatment and disposal of effluent water. Include in the discussion the potential impacts of effluent water released into the environment.

- Discuss waste management strategies, including avoidance of waste generation, reduction, reuse, recycling, storage, transport and disposal of waste, and site drainage and erosion control.
- Discuss the requirements of the Northern Territory Food Act and Public Health Act.
- Discuss how the requirements in the Department of Health and Community Services, Environmental Health Information Bulletin No.6, Requirements for Mining, Construction and Bush Camps (July 2006) will be met.
- Detail hazardous materials to be stored and/or used on site; provide their Material Safety Data Sheets and environmental toxicity data and biodegradability for raw materials and final products.

4.8 Fire

- Identify activities, which pose a risk of wildfire and describe safeguards for minimising the likelihood of wildfire and fire response plans.
- Develop a fire management plan in consultation with traditional Aboriginal owners, pastoralists and their representative organisations, including the NLC, that have specialist knowledge in fire management.

4.9 Greenhouse gas emissions inventory and benchmarking

Refer to Appendix 1 NT Environmental Impact Assessment Guide – Greenhouse Gas Emissions.

4.10 Socio-Economic

4.10.1 Use (land and aquatic)

4.10.1.1 Baseline

- Identify zoning, uses and features within the project footprint including:
  - urban and rural residential;
  - agricultural, pastoral, fisheries and shipping;
  - conservation, wilderness, scenic and heritage areas;
  - Indigenous land use;
  - recreational land use (eg recreational fishing), areas of research, educational and scientific value; and
  - extractive, mining and other commercial industries.
- Identify land titles (eg freehold, leasehold, pastoral, crown land, native title, mining tenure etc) and rights over land such as Native Title (under the *Native Title Act 1993* and Aboriginal land claims under the *Aboriginal Land Rights (Northern Territory) Act 1976* and any other appropriate legislation).
- List the jurisdictions and responsible authorities for the areas described above and show on maps at appropriate scales, together with the regulatory regime applying to each area.
- Discuss the distances from towns, communities, outstations, houses, recreation areas, and other facilities, and the locations of pipelines, power lines, telephone lines and other infrastructure.

4.10.1.2 Impact

- Describe, including timeframes, the anticipated and potential site specific and cumulative impacts on existing and potential uses and developments (as described in 4.10.1.1) during the construction and operation phases. The proponent is required to consult with responsible authorities for policies on such disturbances.
- Discuss the likely impacts on the land use status and ownership of the land crossed by the proposed pipeline and gas processing case in terms of land acquisition and compensation. Indigenous ownership, including native title claimants and holders, and land use should be a component of this discussion.

4.10.1.3 Management

- Outline measures to minimise the impacts to current and future uses of land and water in the project area. Include an assessment of the need for any land easement acquisition and compensation for loss of land.
- Outline measures to establish appropriate notification and precautions in waterways to prevent marine accidents during construction and maintenance.
- Provide details on measures to rehabilitate areas impacted by the project.

4.10.2 Historic and Cultural Heritage Values

4.10.2.1 Baseline

- Identify Indigenous and non-indigenous places of historic or contemporary cultural heritage significance, including:
  - areas nominated for listing or listed on the Register of the National Estate or the Northern Territory Heritage Register, or Interim listing on either of these Registers;
  - areas nominated for listing or listed on Commonwealth and Territory Heritage registers and Commonwealth and Territory registers of indigenous cultural heritage;
  - sacred sites - provide evidence of an Authority Certificate under the *Northern Territory Aboriginal Sacred Sites Act 1989* and compliance with protection of sites under both the *Aboriginal Land Rights (Northern Territory) Act 1976* and the *Northern Territory Aboriginal Sacred Sites Act 1989;*
  - traditional and historic Aboriginal and Torres Strait Islander (ATSI) archaeological and heritage places and objects protected under relevant Territory and/or Commonwealth legislation;
  - European and Macassan historic sites; and
  - areas with special values to indigenous and non-indigenous people (eg. traditional land use, landscape, visual environment, recreational, commercial, tourism, fisheries, scientific, educational, archaeological sites).
- This should be done through community consultation, historic research and field survey. No information of a confidential nature (particularly that related to anthropological matters) relevant to indigenous people or groups is to be disclosed in the PER. However, the PER must describe the arrangements that have been negotiated with relevant indigenous groups in relation to anthropological and archaeological surveys.
- Archaeological surveys should cover all of the project area, including those outside of the construction corridor, such as construction campsites, turnaround areas and borrow pits. Archaeological survey reports should be forwarded to Heritage Conservation Services one completed.

- Advice and permits on the conduct of these studies should be sought from the responsible authorities. Independent qualified professionals in consultation with the Traditional Owners, or their representative bodies in the relevant area must conduct surveys. Research and surveys are to be carried out using an appropriate methodology which provides for involvement of indigenous people and which is acceptable to the traditional owners concerned with the relevant areas. Relevant indigenous groups should be consulted in relation to the nature and scope of surveys and the appointment of the people to undertake them. Consultation with historical organisations should also be undertaken.

4.10.2.2 Impact

- Describe the potential impacts on the features described in 4.10.2.1.
- The identification of indigenous cultural heritage impacts is to take place in consultation with relevant indigenous groups. This should assess the Project's effects on lifestyles, traditional fishing practices, heritage places, the impact of increased visitation and the effects on indigenous culture generally. All groups should be consulted in relation to the traditional subsistence economy, their natural resource use, and Native Title interests.
- Discuss the impacts on the relationships between groups identified with traditional and/or contemporary interest in the project area.

4.10.2.3 Management

- Every attempt should be made to identify a pipeline route and gas processing site, which avoids any significant heritage areas. The separation distances between right of way and associated infrastructure and identified areas of cultural significance should be considered.
- Cultural Heritage Management Plans (CHMPs) should be developed and implemented with the direct involvement of indigenous people. The CHMPs should encourage ongoing protection and management of cultural values; maximise involvement in management strategies and enable proponents to meet duty of care to protect Aboriginal cultural values.
- Describe procedures following the discovery of surface or sub-surface materials during the course of the project.
- If any suspected human remains are unearthed or located during works, the police must be immediately notified and the remains must not be disturbed until all necessary investigations are complete.

4.10.3 Social Environment

4.10.3.1 Baseline

- Identify key stakeholders.
- Detail regional community structures and vitality (including demography, health, education and social well being, access to services, housing, etc).
- Identify the number and capacity of existing human services to support a remote construction work force:
  - skills audit of affected communities;
  - workforce characteristics; and
  - housing accommodation type and quantity.

4.10.3.2 Impacts and Management

The PER should include a Social Impact Management Plan developed in consultation with impacted communities, which discusses:

- general social impacts of the proposal during construction and operation, including the impacts of the construction workforce/ maintenance teams on affected landowners (including native title holders and claimants) and communities, recreational users, health and housing, property values and local authority rates;
- the potential of the local communities to meet the demands for employment and provisions throughout the construction, rehabilitation and operation phases of the project.
- the relevant government policies related to employment in regional areas and discuss compatibility of the project with these policies (liaise with the Office of Indigenous Policy, Department of the Chief Minister).
- relations between groups, in particular those based on age, sex, kinship, and place of origin and how this will be impacted by the Project;
- opportunities for training and employment during construction of the Project (eg. employment, monitoring and maintenance contracts) and how this will be structured, managed and implemented;
- options for possible external commercial arrangements;
- possible future benefits following construction;
- that all employees be employed under a strict code of conduct, and that they are compelled to abide by any alcohol restrictions under the *Liquor Act* in the areas of operation and that they strictly comply with the *Misuse of Drugs Act*;
- opportunities for ongoing involvement in the project operation;
- measures to maintain security at all work sites and camps;
- the provision of cultural awareness programs and behavioural guidelines to project employees; and
- monitoring regimes to monitor and evaluate the management of the above mentioned impacts. Provide for modifications to existing measures where mitigation strategies fail to prevent negative impacts.

4.10.4 Economics

4.10.4.1 Baseline

Detail local, regional, state and national economic viability (including economic base and economic activity, future economic opportunities, etc).

4.10.4.2 Impacts and Management

- The PER should present a balanced broad summary of the project's impact on the regional, territory and national economies in terms of direct and indirect effects on employment, income and production. It should specify any disturbance to existing land use or threat to wilderness areas, which may impact on commercial activities and potentially impact adversely on employment.
- An indication of the broader development benefits of the project should be included.
- Describe opportunities available to regional centres/communities based on the activity generated by the project (construction, rehabilitation and operation) and the availability of gas and other services to existing and potential customers.

4.10.5 Infrastructure and Transport

4.10.5.1 Baseline

- Detail existing transport networks (including road, air and ports), telecommunications (optical fibre routes), gas and electricity infrastructure, and water supply and wastewater utilities. Include detail to differentiate between types of infrastructure eg. road type, dual carriage way/single lane bitumen/gravel.
- Identify constraints with existing infrastructure and transport networks (eg wet season access, periods of road closure and load limits, tides and sea conditions).
- Provide details of new infrastructure that will be required for the project including any requirements to upgrade existing infrastructure. In particular, provide locations of new roads or tracks, lay down storage areas, turning circles, approach diversion lanes etc.

4.10.5.2 Impact

- Describe the potential impacts of the proposal on existing and future local infrastructure and transport networks during construction and operation. This should include reference to increased road usage, vehicles types, vehicle numbers and shipping generated by the project.
- Detail the value of 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.
- Discuss the potential impacts of transport operations on public amenity associated with construction and operation (noise, dust, light).
- Discuss the possible impacts on the planned NT Government upgrade of the Port Keats Road, and how these works may coincide with the construction of the pipeline.
- Consider the Department of Planning and Infrastructure directive that the proposed route should be outside of any formal road reserve corridors managed by the Road Network Division where they exist. Where no formal road reserve exists, the proposed route should be a minimum of 50m from the road centreline.

4.10.5.3 Management

- Describe the management of impacts on the road system and other existing infrastructure, including proposed corrective measures (in consultation with relevant regulatory agencies) and relevant guidelines used for construction, and operational and maintenance phases. Include measures to upgrade, maintain and restore gazetted or nominated roads and access tracks, and to undertake pipeline crossings of tracks.
- Outline requirements and responsibilities for rehabilitation or maintenance of roads and other project infrastructure upon project completion.
- Outline the process agreed with by the Department of Planning and Infrastructure and relevant local authorities for entering road reserves and undertaking works that affect road reserves.
- Discuss the provision for safety of the travelling public if a high pressure gas pipeline were to be located in a road reserve.
- Discuss traffic control measures and measures to minimise disruption to road users during construction of the pipeline and to ensure their safety during both construction and subsequent operation of the pipeline.

5 PROJECT ENVIRONMENTAL MANAGEMENT

Specific safeguards and controls, which would be employed to minimise or remedy environmental impacts, are to be outlined. These are to be covered in detail in the Environmental Management Plans (EMPs).

5.1 Environmental Management System

It is recommended that the proponent develops and implements an Environmental Management System (EMS) for the project. The EMS should incorporate all facilities and operations associated with the project to an accepted standard commensurate with the risk of environmental harm. Accepted EMS standards are specified in:

- AS/NZS ISO 14000 – Environmental Management System, Guidelines on Principles;
- AS/NZS ISO 14001 – Environmental Management System, Specifications with guidance for Use;
- BS 7750 – Specifications for Environmental Management Systems; and
- The APPEA code of Environmental Practice.

The EMS should include an annual program with the objective of verification of compliance with all environmental performance commitments, including permits and licences. The Environmental Management Plan required as part of this PER should describe a commitment to develop an EMS to one of the above specifications.

Discuss the potential use of an Integrated Environmental Management System (EMS) incorporating Environment Management Plans (EMPs), Monitoring and Reporting arrangements, or equivalent site-based management plans that would assist the determination of appropriate approval conditions for the project.

5.2 Resourcing and Policies

Information is to be provided on strategic matters relating to environmental management and should include:

- staffing and resourcing arrangements to ensure that the measures described in the report will be carried out effectively;
- procedures and instructions to employees on minimising unnecessary environmental impacts;
- a staff induction and education program to ensure an informed response to construction and operational environmental concerns; and
- development of staff behavioural guidelines and cross-cultural awareness training.

5.3 Environmental Management Plan

- It is recommended that all environmental commitments made in the PER be included and indexed in the Construction and Operational Environmental Management Plans.
- The EMPs should be prepared in consultation with the relevant Commonwealth and Territory advisory agencies.
- Provide strategic draft EMPs with the PER.
- Discuss the process for updating the EMPs including periods for regular review.

- The EMP commitments should include clear timelines for key commitments, especially in relation to stabilisation and rehabilitation of the corridor and other disturbed areas.
- When information is not available, it should be described with an indication of how and when the information will be incorporated into the final detailed EMP.
- The EMPs must be prepared in accordance with recognised standards and, in particular, to standards applicable to the construction and operation of gas production facilities and pipelines and as required by Commonwealth and Territory legislation, for example The Australian Pipeline Industry Association Inc. (1998) *Code of Environmental Practice – Onshore Pipelines*.
- The EMPs should also cover any ancillary developments with potential environmental impacts, occurring as part of the pipeline. This should ensure that environmental risk, particularly to regional communities, is minimised.
- Reference to the standards used is required; relevant standards are referred to in Section 5.1 in relation to Environmental Management Systems. The plan should address, but not be limited to, the following matters:
    - the management objectives;
    - specific strategies to meet the management objectives, such as the preparation and implementation of various management plans, eg. rehabilitation plans, habitat enhancement projects, erosion and sediment control plans, pollution control plans, greenhouse emissions, waste management plans, etc, in consultation with agencies;
    - the quality assurance, monitoring and auditing requirements and programs including the identification of performance indicators and criteria, monitoring and auditing locations and frequency;
    - identification of responsible personnel in the Proponent's organisation; in the contractors' staff and in the government agencies concerned;
    - reporting processes and structures;
    - whole of project and life of project variations to environmental conditions; and
    - linking of PER findings with environmental authorities and development approvals.

5.4 Monitoring and Reporting Strategies

Specific programs of monitoring or measuring the success of the Project's environmental management are to be outlined. These should be covered in greater detail in the Environmental Management Plan. The PER should include strategies to enable appropriate reporting to Aboriginal landholders. Matters to be considered should include:

- details of inspections to be undertaken to ensure the integrity of the pipeline; and
- objectives to measure rehabilitation success, address weed infestation, restrict access along the pipeline route, extent of erosion along the route, water quality in adjacent streams and control of biting insect species of pest and health significance.

Performance requirements should be specified quantitatively, including performance indicators for each aspect to be measured, and the stipulated target level or standard to achieve for each indicator. The timing and frequency of monitoring should also be provided. Monitoring programs should:

- ensure safeguards are being effectively applied;
- be capable of identifying any differences between predicted and actual impacts; and
- identify the party responsible for undertaking corrective actions, and the actions taken to address problems.

The reporting program should detail:

- steps to be taken to correct detrimental effects identified by monitoring;
- procedures for reporting on monitoring programs; and
- proposed recipients of reports.

The monitoring of rehabilitation success at pipeline sites adjacent to or across waterways must continue for an adequate period to ensure that such works/rehabilitation withstand the natural flow regimes of the region.

6 HEALTH AND SAFETY PROGRAM

- Health and Safety issues pertaining to the design, construction and operational phases of the project, and the transport of construction materials, should be investigated. This should address issues concerning employees visiting the site and members of the public.
- Discuss issues relating to provision of emergency first aid treatment and transport of sick or injured persons to the nearest appropriate medical facility.
- Discuss measures to securely store explosives and volatile substances in accordance with relevant legislation.
- Prepare a management and administration plan outlining strategies and procedures in the event of an emergency.

7 RISK ASSESSMENT AND EMERGENCY MANAGEMENT PLANS

7.1 Risk Assessment

- The Proponent shall carry out a Risk Assessment in accordance with AS 2885 Gas and Liquid Petroleum Pipelines and the guidelines of the responsible authority, where relevant.
- While the PER must deal comprehensively with on-site risks, it is suggested that external risks to the project also be considered. It is suggested that external risks from natural hazards be determined on the basis of AS/NZS Risk Management Standard 4360:1999.
- The study should discuss all potential risks associated with operation of the pipeline. Where possible describe these risks in quantitative terms.
- An indication is required of the likelihood of possible abnormal events that may occur in operation, together with the safeguards that will be employed to reduce the likelihood of their incidence.
- The seismic stability of the pipeline route needs to be assessed and the vulnerability of the platform, pipeline and processing facilities to cyclonic conditions and flooding should be discussed.
- Analysis shall be conducted of the consequences of these events in terms of possible risks to public safety and environmental damage in the Project area, particularly in the vicinity of the pipeline.
- Details are to be provided of the safeguards that will be employed or installed to reduce the risk of injury to persons, fauna and environmentally sensitive sites along the pipeline route.
- A review of potential hazards and accident risk during the construction, operational and decommissioning phases should be provided.

7.2 Emergency Management Plan

An outline of the proposed emergency management procedures, including the likelihood of accidental release of gas or other materials from the pipeline is to be provided. The information should include:

- the quantity of gas or other materials that would be lost;
- the area affected by the gas, under a range of likely flow conditions, including no flow up to a "typical" flood flow; and
- the approximate time scale for removal of gas by natural processes.

The following should also be considered:

- contingency plans to deal with hydrocarbon (eg. 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;
- ensure that development of emergency planning and response procedures are determined in consultation with regional emergency service providers; and
- include the relevant Commonwealth and Territory agencies in relation to emergency medical response and transport and first aid matters.

8 PUBLIC INVOLVEMENT AND CONSULTATION

Public involvement and the role of government organisations should be clearly identified. The outcomes of surveys, public meetings and liaison with interested groups should be discussed and any resulting changes made to the proposal clearly identified. Details of any ongoing liaison should also be discussed.

Negotiations and discussions with local and community government, the Territory Government and the Australian Government should be detailed and any outcomes referenced. Details of any ongoing negotiations and discussion with government agencies should also be presented.

9 BIBLIOGRAPHY

The Draft PER should contain a comprehensive reference list/bibliography. Any source of information such as studies, research, maps and personal communications used in the preparation of the Draft PER should be clearly identified, cited in the text and referenced in the bibliography.

10 GLOSSARY

A glossary should be provided, defining the meaning of technical terms, abbreviations and colloquialisms. (Note: throughout the Draft PER, technical terms and jargon should be minimised).

11 APPENDICES

Information and data related to the Draft PER but unsuitable for inclusion in the main body of the report (eg. because of its level of technical detail) should be included as appendices. This may include detailed analyses, monitoring studies, baseline surveys, raw data and modelling data. Where necessary, specific guidance should be provided on the most appropriate means of accessing information not appended to the Draft PER.

APPENDIX 1

NT Environmental Impact Assessment Guide

Greenhouse Gas Emissions

March 2006

1. PURPOSE

The Northern Territory Government's objective for managing greenhouse gas emissions from new and expanding operations is to minimise emissions to a level that is as low as practicable.

This Guide aims to assist proponents in providing the information needed by the Environment Protection Agency (EPA) to assess the impact of greenhouse gas emissions from proposed projects during assessment under the *Northern Territory Environmental Assessment Act 1994*[1].

2. THE GUIDANCE

2.1 Emissions estimates

Proponents should detail the following in their environmental impact assessment documentation:

a) an estimate of the **greenhouse gas** emissions for the construction and operation phases:

- in **absolute** and **carbon dioxide equivalent** figures (refer to the Glossary in this Guide) for each year of the project; and
- identified on a gas by gas basis and by **source** (including on site and upstream sources such as emissions arising from land clearing and the production and supply of energy to the site).

*Emissions estimates are to be calculated using the methodology developed and periodically updated by the **National Greenhouse Gas Inventory Committee**[2] or another national or internationally agreed methodology.*

b) details of the **project lifecycle greenhouse gas emissions** and the greenhouse gas efficiency of the proposed project (per unit and/or other agreed performance indicators).

Lifecycle emissions and greenhouse gas efficiency should be compared with similar technologies producing similar products.

To provide an understanding of the broader impact of the proposal, proponents are encouraged to place the estimated greenhouse gas emissions from the proposal into a national and global context[3].

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[1] As required under Action 6.4 of the NT Strategy for Greenhouse Action 2006, available at http://www.nt.gov.au/nreta/environment/greenhouse/publications/pdf/greenhouse_action.pdf

[2] Up to date methodology can be obtained from the Australian Greenhouse Office. See www.greeenhouse.gov.au.

2.2 Measures to minimise greenhouse gas emissions

Proponents must demonstrate consideration of a wide range of options and indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions from the proposed project, including:

(a) identifying energy conservation measures, opportunities for improving energy efficiency and ways to reduce fugitive emissions where applicable;

(b) indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources, taking into account fossil fuels used for supplementary power generation; and

(c) their commitment to offsetting greenhouse gas emissions.

*The design measures to maximise efficiency and minimise emissions should represent **best practice** at the time of seeking project approval.*

Proponents are to advise whether they will join the **Commonwealth Government's Greenhouse Challenge** program.

Emission offsets include activities that remove carbon from the atmosphere or reduce the greenhouse gas intensity (output per unit product) from current or future activities. Examples may include but are not limited to:

- establishment and maintenance of perennial vegetation;
- **sequestration** of carbon by geological, chemical, biological or other means;
- reducing the carbon intensity of existing activities;
- replacing fossil fuels with renewable fuels;
- trading emissions permits in a nationally approved system;
- synergistic linking of enterprises to reduce net greenhouse gas outputs; and
- development of new greenhouse gas efficient technologies.

Proposed emissions offsets projects should include an estimate of greenhouse gas emissions savings that are likely to be achieved through implementation.

Measures that offset emissions within the NT are encouraged, and EPA staff can discuss possible options with proponents.

2.3 Emissions monitoring and reporting

Consistent with the principles of continuous improvement, a program is to be outlined in the proponent's Environmental Management Plan which includes ongoing monitoring, investigation, review and reporting of greenhouse gas emissions and **abatement** measures. It should be noted that in 2006, large energy users (those using greater than 0.5 petajoules per year) will be required by the Commonwealth Government to report publicly on their greenhouse gas emissions.

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[3] Information on Australia's national emissions profile can be obtained from the Australian Greenhouse Office at www.greenhouse.gov.au; international emissions from the United Nations Framework Convention on Climate Change (UNFCCC) webite at http://unfccc.int/2860.php/ .

2.4 Preparedness for climate change

Proponents should demonstrate due consideration of the risk of climate change impacts to the proposal. Relevant variables may include, but are not limited to:

- increasing average temperature and evaporation rates;
- variation in rainfall and the incidence of floods;
- sea level rise;
- increased frequency and intensity of cyclones and storm surge levels; and
- altered distribution of pests and disease.

In assessing climate change risk, proponents should be guided by recent projections published by organisations such as the CSIRO and Intergovernmental Panel on Climate Change (For CSIRO projections, see: http://www.ipe.nt.gov.au/whatwedo/greenhouse/documents/pdf/ntclimatechange.pdf).

3. GLOSSARY OF TERMS

Abatement: Limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, fuel displacement or switching, carbon stabilising techniques or **sink** enhancement.

Absolute emissions: Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period.

Best Practice: A best practice is a process, technique, or use of technology, equipment or resource that has a proven record of success in minimising energy use and greenhouse gas emissions. A commitment to use best practice is a commitment to use all available knowledge and technology to ensure that greenhouse gas emissions are minimised.

Carbon Dioxide Equivalent: A unit of greenhouse gas emissions calculated by multiplying the actual mass of emissions by the appropriate **Global Warming Potential**. This enables emissions of different gases to be added together and compared with carbon dioxide (see Table 1 below).

Commonwealth Government's Greenhouse Challenge program: A cooperative effort by industry and the Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. See: www.greenhouse.gov.au/challenge.

Greenhouse Gases: Table 1 lists the greenhouse gases proponents are required to report on.

Global Warming Potential (GWP): The warming potential of a gas, compared to that for carbon dioxide. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. Refer Table 1.

Project Lifecycle Greenhouse Gas Emissions: Those greenhouse gas emissions measured cumulatively over a defined period. Typically this period is from the point of extraction of the raw materials to either the beginning of the consumer phase of a product or the final disposal or recycling stage of a product, depending on its nature. Proponents should justify their choice of the defined period.

National Greenhouse Gas Inventory Committee: A committee comprising representatives of the Commonwealth, State and Territory Governments that oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia.

Sequestration: Removal of greenhouse gases from the atmosphere by vegetation or technological measures. Sequestration is not yet precisely defined for the purposes of recognised trading or offset schemes. Accordingly, OEH will take a common sense approach on a case by case basis in the interim. To assist proponents, OEH regards sequestration as a process that results in the isolation of carbon dioxide from the atmosphere for a period which is significant in terms of influencing the global warming effect.

Source: Any process or activity that releases a greenhouse gas into the atmosphere.

Table 1: Greenhouse gases and respective Global Warming Potentials (GWPs)[4]

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO_2)	**1**
Methane (CH_4)	**21**
Nitrous oxide (N_2O)	**310**
Perfluorocarbons (CF_x)	**6500 - 8700**
Hydrofluorocarbons (HFCs)	**560 – 11 700**
Sulphur hexafluoride (SF_6)	**23 900**

Greenhouse gas emissions expressed in carbon dioxide equivalent (CO_2-e) are calculated by multiplying the actual mass of emissions for each greenhouse gas by its respective GWP factor.

[4] GWP factors listed are those published by the International Panel on Climate Change at the time of publication of this Guide.