

**GUIDELINES FOR THE PREPARATION OF AN
ENVIRONMENTAL IMPACT STATEMENT**

**KATHERINE TO GOVE GAS PIPELINE
ALCAN GOVE PTY LTD**

January 2013

1	Introduction.....	1
2	General Advice on EIS.....	2
2.1	General Content.....	2
2.2	Format and Style.....	2
2.3	Administration	3
2.4	Public Exhibition.....	4
3	Description of the Proposed Development.....	5
3.1	General Information.....	5
3.2	Description of the Proposal	5
3.2.1	Methods and Processes.....	6
3.2.2	Workforce and Accommodation.....	7
3.2.3	Ancillary Infrastructure.....	7
3.2.4	Service and Infrastructure Requirements	7
3.2.5	Waste Management	8
3.3	Economic Value	8
3.4	Alternatives	9
4	Existing Environment.....	9
4.1	Climate.....	10
4.2	Topography and Geomorphology	10
4.3	Geology.....	10
4.4	Soils	10
4.5	Biodiversity.....	10
4.6	Biting Insects.....	12
4.7	Surface water	12
4.8	Groundwater	13
4.9	Air Quality, Noise and Vibration.....	13
4.10	Service and Infrastructure Networks.....	13
4.11	Historic and Cultural Heritage Value.....	14
5	Social Aspects	14
6	Risk Assessment	15
6.1	Risk Assessment Approach.....	15
6.2	Risks to Human Health and Safety.....	15
6.2.1	Key Risks	15
6.2.2	Information Requirements	16
6.2.3	Mitigation.....	16
6.3	Risks to Biodiversity	17
6.3.1	Key Risks	17
6.3.2	Information Requirements	17
6.3.3	Mitigation.....	18
6.4	Competing Demand and/or Impacts on Existing Services and Infrastructure.....	18
6.4.1	Key Risks	18
6.4.2	Information Requirements	18
6.4.3	Mitigation.....	18

6.5	Risks to Water Quality	19
6.5.1	Key Risks	19
6.5.2	Information Requirements	19
6.5.3	Mitigation.....	19
6.6	Social Impacts.....	20
6.6.1	Key Risks	20
6.6.2	Information Requirements	20
6.6.3	Mitigation.....	20
6.7	Historic and Cultural Heritage.....	20
6.7.1	Key Risks	20
6.7.2	Information Requirements	20
6.7.3	Mitigation.....	21
6.8	Other Issues.....	21
6.8.1	Bushfires	21
6.8.2	Noise and Vibration	21
6.8.3	Air Quality	21
6.8.4	Visual Amenity	22
6.8.5	Greenhouse Gas Emissions.....	22
7	Environmental Management	22
8	Public Involvement and Consultation	23
9	Guidance Notes	23
9.1	Environmental Offsets	23
9.2	Public Health Premises and Food Premises.....	24
9.3	Water Supply.....	24
9.4	Wastewater	24
9.5	Mosquito Breeding	24

1 Introduction

Pacific Aluminium: Alcan Gove Pty Limited (the Proponent) proposes to construct and operate a 600 km natural gas pipeline from a connection, approximately 20 km south of Katherine, to the bauxite mine and alumina refinery located at Gove, north east Arnhem Land. Power to the mine and refinery is currently generated from imported fuel oil. The Katherine to Gove Gas Pipeline (KGGP) would offer the Proponent access to a competitively priced source of natural gas and help underpin the long term energy supply to the operations at Gove.

The KGGP would consist of a buried, high-tensile steel pipe located in a 30 m wide construction corridor. The construction corridor and trench for the KGGP would be prepared using graders, backhoes, bulldozers, excavators, trenching machines, rock saws and drilling and blasting. The proposed route would cross several watercourses, roads and infrastructure corridors. Proposed specialised techniques for installing the pipeline at these locations include open-cut and horizontal directional drilling.

Supporting infrastructure would include access roads and above ground facilities, such as meter stations, scraper stations, mainline valves and compressor stations, at intervals along the route. The pipeline coating, above ground pipe work, equipment and fittings would be designed for an operational life of 50 years.

It is anticipated that a workforce of approximately 600 personnel would be required during construction. The workforce would be accommodated, with appropriate utilities, in mobile construction camps along the KGGP route, with the exception of Katherine.

This project is related to the previous Trans Territory Pipeline (TTP) project that was being assessed at the level of an Environmental Impact Statement (EIS) under a bilateral agreement between the Northern Territory (NT) and Australian Government between 2003 and 2007. The TTP project was stalled under the NT *Environmental Assessment Act 1982* (EA Act) and formally withdrawn from assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The KGGP project is considered a new stand-alone project although there are parallels between the TTP and KGGP projects.

The KGGP project was submitted to the NT Environment Protection Agency (NT EPA) for assessment under the EA Act on 5 November 2012. On 29 November 2012, the Deputy Chief Executive of the NT EPA determined that the KGGP project requires formal assessment under the EA Act at the level of an EIS.

Issues contributing to this decision include:

- The size and scale of the proposal;
- The potential impacts on protected flora and fauna;
- The potential impacts on biodiversity from land clearing activities;
- The potential disturbance to areas of conservation significance;
- Increased demand and/or impacts on existing services and infrastructure, including roads, railways and water supplies;
- Uncertainties associated with the method for installing the proposed KGGP at potentially significant habitats, watercourses, roads and infrastructure corridors;
- The potential impacts of surface and/or groundwater extractions for water supply to the project;

- The potential impacts associated with sourcing suitable rock, gravel and fill;
- The potential risk to public and environmental health from localised discharges from the proposed development into watercourses and aquifers;
- The potential impacts to stakeholders, including land holders and traditional owners; and
- The potential social, cultural and economic impacts, including the risks of the project not realising its projected economic and social benefits.

The KGGP project was referred under the EPBC Act to the Australian Government on 4 November 2012 and was determined to be a controlled action. The project has the potential to have a significant impact on the following matters of National Environmental Significance (NES) that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (section 18 and 18A); and
- Listed migratory species (sections 20 and 20A).

The KGGP project is being assessed under the bilateral agreement between the NT and Australian Governments.

These Guidelines were developed to assist the Proponent in preparing an EIS for the proposed action, in accordance with Clause 8 of the NT Environmental Assessment Administrative Procedures. Information about the project and its relevant impacts, as outlined in this document, is to be provided in the EIS. This information must be sufficient to allow the NT EPA to make informed recommendations to the Minister and Responsible Minister in accordance with the EA Act.

2 General Advice on EIS

2.1 General Content

The EIS should be a stand-alone document. It should contain sufficient information to avoid the need to search out previous or additional, unattached reports.

The EIS should enable interested stakeholders and the NT EPA to understand the environmental consequences of the proposed development. Information provided in the EIS should be objective, clear, succinct, and easily understood by the general reader. Maps (using an appropriate scale, resolution and clarity), plans, diagrams and other descriptive detail should be included. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

The level of analysis and detail in the EIS should reflect the level of significance of the expected and potential impacts on the environment, as determined through adequate technical studies. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which a limitation, if any, of available information may influence the conclusions of the environmental assessment should be discussed.

Information materials summarising and highlighting risks of the project should be provided in a culturally appropriate format and language, where relevant.

2.2 Format and Style

The EIS should be produced on A4 size paper capable of being photocopied, with any maps, diagrams or plans on A4 or A3 size paper, and in colour, if possible.

The EIS should comprise of three elements:

1. Executive summary

The executive summary must include a brief outline of the project and each chapter of the EIS, allowing the reader to obtain a clear understanding of the proposed project, its environmental implications and management objectives. It must be written as a stand-alone document, able to be reproduced on request by interested parties who may not wish to read the EIS as a whole.

2. Main text of the document

The main text of the EIS should include a list of abbreviations, a glossary to define technical terms, acronyms and abbreviations, and colloquialisms. The document should consist of a series of chapters detailing the level of significance of the expected and potential impacts on the environment from the project.

3. Appendices

The appendices must include detailed technical information, studies or investigations necessary to support the main text that can be made publicly available, including:

- A table listing how these Guidelines have been addressed in the EIS, cross-referenced to chapters, page numbers and/or appendices;
- An outline of the relevant legislation, codes, standards and guidelines applicable to the project;
- A list of persons and agencies consulted during the EIS;
- The names of, and work done by, the persons involved in preparing the EIS; and
- The qualifications and experience of the people involved in work contributing to the EIS.

The EIS must be written so that any conclusions reached can be independently assessed. All sources must be appropriately referenced using the Harvard Standard. The reference list should include the address of any internet pages used as data sources. All referenced supporting documentation must be available upon request.

2.3 Administration

The Proponent should lodge ten bound hardcopies and an electronic (Adobe PDF format) copy of the EIS with the NT EPA and two bound hardcopies with the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). The electronic copies should be provided both as a single file of the entire document and separate files of the document components. Additionally, a Microsoft Word copy of the EIS should be provided to facilitate the production of the Environmental Assessment Report.

The Proponent should consider the file size, format and style of the document appropriate for publication on the NT EPA website. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

The Proponent is to advertise the draft EIS for review and comment in:

- The NT News;
- The Katherine Times; and

- The Arafura Times.

The Proponent is to coordinate with the Dhimurru Aboriginal Corporation, or appropriate persons/organisation, to ensure that a notice regarding the draft EIS for review and comment is available on the Social Media Facebook Nhulunbuy Noticeboard website.

Please note that the NT EPA requires the EIS document and a draft of the advertisement at least one week prior to advertising the draft EIS, to arrange web upload of the document and review and comment on advertising text.

2.4 Public Exhibition

The draft EIS should be made available for public exhibition at:

- NT EPA, 2nd Floor, Darwin Plaza Building, 41 Smith Street Mall, Darwin;
- Minerals and Energy Information Centre, Department of Mines and Energy, 3rd Floor, Paspalis Centrepont Building, 48 Smith Street Mall, Darwin;
- SEWPaC Library, John Gorton Building, Parkes, Canberra;
- Northern Territory Library (NTL), Parliament House, Darwin;
- The Environment Centre NT, Unit 3, 98 Woods St, Darwin;
- Roper Gulf Shire Office, 29 Crawford St, Katherine;
- Northern Land Council Head Office, 45 Mitchell St, Darwin;
- Northern Land Council Katherine, Lot 5, 29 Katherine Terrace, Katherine;
- Northern Land Council Ngukkur, Balamurra St, Ngukkur; and
- Northern Land Council East Arnhem, Endeavour Square, Nhulunbuy.

The draft EIS should be made available for public exhibition, using the most appropriate locations or services, at:

- Barunga
- Beswick
- Bulman
- Weemol
- Tindal
- Barrapunta
- Dhunganda
- Donydji
- Dhamiyaka
- Gurumuru
- Dhalinybuy
- Baghetti

- Mobarn
- Maranboy
- Gapuwiyak

The EIS exhibition period should not occur in late December or January in any year to ensure optimal opportunity for public and Government viewing of the EIS document. Additional time will be added to the EIS exhibition period if the EIS exhibition overlaps any Christmas and January periods.

3 Description of the Proposed Development

3.1 General Information

The EIS should provide a brief background and context to the KGGP project, including:

- The title of the project;
- The full name and postal address of the Proponent;
- Details of the Proponent's environmental record, including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Proponent;
- A clear outline of the objective of the project;
- The background to the development of the project;
- How the project relates to any other proposals or actions (of which the Proponent should reasonably be aware) that have been or are being taken, or that have been approved in the region;
- The current status of the project; and
- The consequences of not proceeding with the project.

3.2 Description of the Proposal

The EIS should identify all the processes and activities intended for the KGGP proposal, and associated ancillary activities, during the life of the project.

Aspects to be covered include:

- An explanation of the objectives, benefits and justification for the project;
- A detailed schedule or timeline for all relevant aspects of the project;
- Tenure/s under which the proposal would be held and any Native Title issues;
- The preferred KGGP route and construction corridor, illustrated with respect to relevant environs identified in Sections 4 and 5 of these Guidelines;
- The preferred KGGP route, construction corridor and buffer zones, illustrated at an appropriate resolution to allow the identification of precise distance(s) to Commonwealth Lands Defence;
- The preferred layout, locations (with GPS coordinates) and physical details of above ground facilities for all stages of the project, including:

- mainline valves;
- meter stations;
- scraper stations;
- compressor stations;
- construction camps;
- linkages to existing pipelines; and
- any other facilities.

3.2.1 Methods and Processes

A detailed description of the methods and processes during:

- Pipeline construction and installation:
 - open-cut trench excavation;
 - horizontal directional drilling;
 - trench dimensions;
 - construction corridor and lay down areas;
 - type and source of rock, gravel, fill and other bedding materials;
 - burial of pipeline;
 - blasting and geotechnical requirements; and
 - detailed method, description and location (with GPS coordinates) of every identified potentially significant habitat, watercourse, road and infrastructure corridor to be intersected by the proposed KGGP.
- Pipeline operation:
 - operational, maintenance and safety procedures;
 - methods of testing the pipeline's integrity;
 - pipeline control and monitoring; and
 - provisions for the shutdown of 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.
- Pipeline decommissioning and rehabilitation:
 - decommissioning and rehabilitation of temporary and permanent facilities, including the pipeline;
 - revegetation methodologies; and
 - rehabilitation objectives for the project area beyond the intended use.
- Pipeline design with regard to AS2885, and other legislative requirements.

3.2.2 Workforce and Accommodation

- Food preparation provision and storage;
- Licensed premises or alcohol storage facilities;
- Dry or restricted areas in terms of alcohol consumption;
- Ablution facilities, sewerage, and sewage treatment;
- Proximity of accommodation to work sites;
- Potable water sources, treatment and supply; and
- Dust and noise control (where accommodation is located close to work sites).

3.2.3 Ancillary Infrastructure

- Water supply facilities, storages, bores, standpipes and pipelines;
- Buildings;
- Permanent and temporary access tracks and roads, and the duration of accessibility;
- Permanent and temporary accommodation facilities, and the duration of accessibility;
- Site access points;
- Restricted sites;
- Fuel and chemical storages; and
- Telecommunications.

3.2.4 Service and Infrastructure Requirements

- Description of transport systems and requirements during the life of the project, including:
 - type, size and number of vehicles required;
 - the estimated volume, tonnage, composition, origin and destination of traffic generated by the project;
 - methods to convey all site traffic (including materials, workers and product) to and from the site;
 - routes for transport, including details of proposed routes for over-dimension or very heavy loads;
 - details of the method of truck loading and load constraint so as to prevent the dropping or tracking of materials onto roads (includes ensuring that all wheels, tracks and body surfaces are free of mud and other contaminants before entering onto a sealed road network);
 - estimated times of travel;
 - provisions for overtaking slow vehicles;

- possible transport impacts as a result of the project, including issues such as dust and road traffic noise;
 - peak user times for vehicular movements by the Proponent/contractors along the Central Arnhem Road (CAR);
 - possible grouping of vehicles (e.g. convoys) to move materials to reduce overall impact on communities along the CAR and to other road users;
 - hazardous or dangerous material which may be transported; and
 - additional road infrastructure works required, including site access and signage.
- Details of water supply, source, treatment and usage, including the number, location and extraction rates of proposed extraction bores;
 - Details of energy sources, requirements and usage;
 - Upgrades to existing infrastructure;
 - Details of the use of airfields associated with communities along the CAR for Fly-in-Fly-out crews and any associated implications including upgrading to desired aircraft size, frequency of aircraft and licensing; and
 - The use and extent of other services required for the project.

3.2.5 Waste Management

- Waste generation and/or by-products and their storage and disposal;
- Methods for storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel); and
- Waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste.

3.3 Economic Value

The EIS should include a balanced summary of the project's economic value (positive and negative) on the regional, state and national economies, in terms of direct and indirect effects on employment, income and production. The following are suggestions that may assist with highlighting the economic value of the project and are not intended to result in the inappropriate disclosure of confidential information. It should be noted in the EIS if data are not available or unsuitable.

Aspects to be covered include:

- The project's contribution to the NT and Australian economy;
- The availability of gas to existing and potential customers;
- A summary of project feasibility, including a discussion of the availability of gas to support the project;
- Estimated total project revenue for the duration of the project (to provide the economic scale of the project);
- Total contribution to Gross State Product (GSP) and Gross Domestic Product (GDP) over the economic life of the project;

- Opportunities available to regional centres based on the activity generated by the project (construction, rehabilitation and operation);
- Estimated overall tax;
- Estimated capital expenditure for the whole project;
- Expected annual operational expenditure;
- Employment and business opportunities (direct and indirect), including sources of workforce, skill levels required and opportunities for local people and businesses, in the different sections of the pipeline and at the different stages of the project;
- Estimated workforce and contractor numbers by occupational classification;
- Overall employment training proposed during commencement, construction and operations;
- Planned Indigenous employment, training and other project participation;
- Expected level of overseas recruitment (if appropriate);
- Availability of goods and services;
- Community and economic value of any residual infrastructure, such as roads, following the life of the project; and
- Other contributions to local communities, including traditional owners.

3.4 Alternatives

The EIS should describe any feasible alternatives to carrying out the project. These alternatives must be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and rejecting others.

Alternatives to be discussed must include:

- Not proceeding with the project;
- Alternative locations for components of the project (e.g. KGGP route; construction corridor);
- Alternative processes, methods and lifecycle (e.g. other options for installing the pipeline if geotechnical problems do not permit horizontal directional drilling or open cut trenching);
- Alternative sources of services; and
- Decommissioning and rehabilitation methods.

4 Existing Environment

Studies used to describe the existing environment of the KGGP project area and its surrounds should be of a scope and standard sufficient to serve as a benchmark (or baseline) against which the impacts over the project over time may be assessed. The level of detail should reflect the scale and nature of the likely studies required to clearly define potential for impact from the project.

Existing environments, and their components, to be discussed must include:

4.1 Climate

- Rainfall patterns (magnitude and seasonality);
- Temperature;
- Humidity;
- Wind;
- Cyclones;
- Climate extremes (e.g. floods); and
- Any seasonal conditions (e.g. cyclones, storm surge, thunderstorms, floods or dust storms) which may influence timing and/or construction methods.

4.2 Topography and Geomorphology

- Maps and descriptions of the regional topography;
- Maps and descriptions of the regional geomorphology; and
- Significant topographical and geomorphological features in the project area.

4.3 Geology

- Maps and interpretation of the regional geology;
- Descriptions of geological structures in the project area;
- Geotechnical surveys;
- Seismic stability data; and
- Significant geological properties, which may influence stability, occupation health and safety, rehabilitation programs, or the quality of water resources in the project area.

4.4 Soils

- Soil types and land unit(s);
- Areas of potential and actual acid sulfate soils, including supporting testworks or studies; and
- Existing level of soil erosion and other disturbances.

4.5 Biodiversity

- Vegetation communities within and adjacent to the project area:
 - a broad overview of the dominant vegetation communities;
 - weed species, including weed species declared under the NT *Weed Management Act*;
 - for each vegetation community, indicate:
 - distribution and abundance;

- conservation status (rare, endangered, vulnerable, threatened species and with reference to which listing); and
- whether native or introduced.
- Potentially significant ecosystems, including, but not limited to:
 - riparian vegetation;
 - protected area buffer zones;
 - important habitat corridors;
 - monsoon forests;
 - wetlands;
 - areas of conservation significance; and
 - geological and other features that may support unique ecosystems (e.g. escarpments, gorges, gullies).

Provide specific reference to the NT *Planning Act* and *Territory Parks and Wildlife Conservation Act* with all threatened species, feral and exotic species, ecological communities, and migratory species listed under the EPBC Act that are likely to be impacted by the proposed action. At a minimum, the following listed migratory and threatened species and communities, protected under Part 3 of the EPBC Act need to be addressed, as appropriate:

- Gouldian Finch (*Erythrura gouldiae*)
- Freshwater Sawfish (*Pristis microdon*)
- Gove Crow Butterfly (*Euploea alcathoe enastri*)
- Red Goshawk (*Erythrotriorchis radiatus*)
- Crested Shrike-tit (northern) (*Falcunculus frontatus whitei*)
- Australian Painted Snipe (*Rostratula australis*)
- Brush-tailed Rabbit-rat (*Conilurus penicillatus*)
- Northern Hopping-mouse (*Notomys aquilo*)
- Northern Brush-tailed Phascogale (*Phascogale pirata*)
- Water Mouse (*Xeromys myoides*)
- Australian Arenga Palm (*Arenga australasica*)
- Crested Shrike-tit (northern) (*Falcunculus frontatus whitei*)
- Arnhem Plateau Sandstone Shrubland Complex
- Northern Quoll (*Dasyurus hallucatus*)
- Masked Owl (northern) (*Tyto novaehollandiae kimberli*)
- Greater Bilby (*Macrotis lagotis*)

- Northern Hopping-mouse (*Notomys aquilo*)
- Bare-rumped Sheath-tail Bat (*Saccolaimus saccolaimus nudicluniatus*)
- Australian Arenga Palm (*Arenga australasica*)
- Gulf Snapping Turtle (*Elseya lavarackorum*)
- Forked-tailed Swift (*Apus pacificus*)
- Great Egret (*Ardea alba*)
- Cattle Egret (*Ardea ibis*)
- Little Tern (*Sterna albifrons*)
- Melville Cicadabird (*Coracina tenuirostris melvillensis*)
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*)
- Barn Swallow (*Hirundo rustica*)
- Rainbow Bee-eater (*Merops ornatus*)
- Derby White-browed Robin (*Poecilodryas superciliosa cerviniventris*)
- Rufous Fantail (*Rhipidura rufifrons*)
- Oriental Plover (*Charadrius veredus*)
- Oriental Pratincole (*Glareola maldivarum*)
- Great Knot (*Calidris tenuirostris*)
- Black-tailed Godwit (*Limosa limosa*)

Where surveys are proposed for the above species, the survey methods provided by the Australian Government should be used. These survey methods are available at:

www.environment.gov.au/epbc/guidelines-policies.html.

Vegetation assessment should be undertaken within a suitable buffer distance along the length of the project area, at an intensity appropriate to identify significant or sensitive vegetation types. Where identified, the extent of significant or sensitive vegetation types should be mapped at an appropriate scale.

4.6 Biting Insects

- Range and density of biting insects;
- Biting insect breeding sites; and
- Seasonal habits.

4.7 Surface water

- Map/s and interpretation of the major catchments, including:
 - major and minor drainage lines (permanent and ephemeral);
 - catchment boundaries;

- surface water flow directions;
 - water reservoirs (natural and artificial);
 - wetlands; and
 - areas of inundation.
- Beneficial uses; and
- Details of the locations of where the pipeline crosses watercourses, including:
 - bed and bank profiles;
 - riparian vegetation;
 - bank and bed stability; and
 - the expected flow regime of the watercourse in the vicinity of the pipeline, in particular the timing of flows in relation to construction work.

4.8 Groundwater

- Map/s and interpretation of groundwater aquifers and hydrogeological properties, including, with specific reference to the pipeline route and corridor:
 - surface connections via springs or recharge zones;
 - proximity to local and regional aquifers;
 - depth to water tables; and
 - potential bore yields.
- Locations of existing groundwater monitoring and extraction bores; and
- Water Control Districts.

4.9 Air Quality, Noise and Vibration

- Receptors sensitive to air quality, dust, noise and vibration adjacent to the proposed pipeline route and relevant ancillary activities; and
- Typical background noise levels.

4.10 Service and Infrastructure Networks

Detail existing infrastructure networks along the route, including:

- Roads;
- Railways;
- Ports;
- Telecommunications (optical fibre routes);
- Electricity;
- Water supply;
- Waste repository;

- Wastewater utilities;
- Details to differentiate between types of infrastructure (e.g. road type, dual carriage way/single lane bitumen/gravel); and
- Constraints with the existing infrastructure (e.g. wet season access, periods of road closure and load limits).

4.11 Historic and Cultural Heritage Value

- 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 Interim list of the Register of the National Estate;
 - 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 compliance with the provisions of the *Aboriginal Land Rights (NT) Act* and *NT Aboriginal Sacred Sites Act* through a valid Authority Certificate or an application for such a Certificate;
 - traditional and historic Aboriginal and Torres Strait Islander archaeological and heritage places and objects protected under relevant Territory and/or Commonwealth legislation;
 - European historic sites; and
 - areas with special values to Indigenous and non-indigenous people (e.g. traditional land use, landscape, visual environment, recreational, commercial, tourism, fisheries, scientific, educational, marine archaeological sites).

5 Social Aspects

The EIS should include a balanced summary of the project's social value (positive and negative) on a regional, state and national scale. A brief description of the current population, demography and social aspects of the project should be provided in the EIS. This should be done through community consultation, historic research and field survey. No information of a confidential nature, particularly related to anthropological matters relevant to Indigenous people or groups is to be disclosed in the EIS.

Existing social aspects, and their components, to be discussed must include:

- Key stakeholders;
- Regional community structures and vitality (e.g. demography, health, education and social well being, access to services, housing);
- 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.

- Social amenity and use of the project area and adjacent areas for fishing, recreation, tourism, industrial, traditional land use, landscape, visual environment residential and/or educational purposes; and
- An assessment of the project components and requirements (Section 3) on lifestyles, traditional practices, heritage places, the impact of increased visitation and the effects on Indigenous culture generally, including impacts on Traditional Ecological Knowledge and Land Management Practices.

6 Risk Assessment

6.1 Risk Assessment Approach

The EIS should be undertaken with specific emphasis on the identification, analysis and treatment of risks through a whole-of-project risk assessment. Through this process, the EIS will:

- Acknowledge and discuss the full range of risks presented by the project, including those of special concern to the public;
- Quantify and rank risks so that the reasons for proposed management responses are clear;
- Acknowledge levels of uncertainty about estimates of risk and the effectiveness of risk controls; and
- Explicitly identify those members of the community expected to accept residual risks and their consequences, providing better understanding of equity issues.

Statements about levels of uncertainty should accompany all aspects of the risk assessment. Steps taken to reduce uncertainty or precautions taken to compensate for uncertainty should be identified and their effect/s demonstrated.

Information provided should permit the reader to understand the likelihood of the risk, its potential severity, and any uncertainty about the effectiveness of controls. Levels of uncertainty preclude robust quantification of risk should be clearly acknowledged.

Sufficient quantitative analysis should be provided to indicate whether risks are likely to be acceptable compared with similar ventures in Australia and Internationally. Assumptions used in the analyses should be explained. Relevant standards, codes and best practice methodologies that minimise risks should be discussed.

The risk assessment should be based on international best practice. Processes for risk management are formalised in Standards Australia / Standards New Zealand (e.g. AS/NZS ISO 31000:2009; HB 436:2004; HB 158:2010; HB 203:2012).

6.2 Risks to Human Health and Safety

6.2.1 Key Risks

The EIS should include an assessment of the risks to people, the environment and nearby facilities associated with the construction, operation, maintenance and decommissioning of the various components of the project, and the storage and transport of materials to and from the work sites.

The aim of this assessment is to demonstrate that:

- The Proponent is fully aware of the risks to human health and safety associated with all aspects of the development;

- The prevention and mitigation of risks to human health and safety are properly addressed in the design specifications; and
- The risks can and will be managed effectively during the construction, commissioning, operation, and decommissioning of the development.

6.2.2 Information Requirements

Aspects to be discussed include:

- Safety risks for the workforce and the general public for the duration of the project;
- Safety risks associated with the project and Australian Defence Force operations and exercises, including aircraft safety;
- Safety risks associated with the project and fire, including combustible materials and wildfire;
- Safety risks associated with unauthorised tapping of the gas pipeline;
- Safety risks associated with asphyxiation due to nitrogen gas exposure during trench excavation; and
- Safety risks to road users associated with increased traffic and use of the existing road networks.

6.2.3 Mitigation

Detailed human health, safety, emergency plans and response procedures need to be developed and provided in the final Environmental Management Plan as a contingency in the event of an emergency or accident. Responsibilities and liabilities in such an event should be described.

The hazard and risk analysis will identify critical areas that need to be addressed in management plans, monitoring programs, and contingency and emergency plans and should include:

- Mitigation measures to address safety risks identified in Section 6.2.2;
- Measures to prevent third party interference with the project;
- Safeguards for minimising the likelihood of wildfire and fire response plans;
- Safeguards, management and monitoring strategies to be implemented to minimise potential aircraft safety:
 - measures to reduce extraneous lighting, considering:
 - proximity of light source to Commonwealth Lands Defence and Australian Defence Force operations;
 - confusion for pilots; and
 - visibility from increased brightness or glare.
 - measures to reduce dust related issues, with specific reference to aviation- and communication-related dusts.
- Safeguards, management and monitoring strategies to be implemented to minimise potential transport impacts:

- safety measures to be used to reduce transport risks (e.g. safety awareness measures);
- methods for complying with any relevant road vehicle axle limits;
- methods for securing loads;
- consultation with local communities affected by transport impacts;
- traffic management;
- measures to reduce any road traffic nuisance impacts (e.g. noise, dust, light); and
- management of driver fatigue.

6.3 Risks to Biodiversity

6.3.1 Key Risks

The KGGP project is of a size and scale to potentially provide access to and connect areas that are in near pristine ecological condition. The potential to introduce and spread weeds, exotic fauna and people to these areas presents a potential threat to long-term regional biodiversity.

The EIS should include an assessment of the risks to biodiversity to demonstrate that:

- The Proponent is fully aware of the risks to biodiversity associated with all aspects of the project; and
- The prevention and mitigation of risks to biodiversity are adequately addressed.

Risk assessment to biodiversity should focus on threats to the conservation significance of vegetation types, identified threatened species and areas of potential significance to listed migrant species.

6.3.2 Information Requirements

Aspects to be discussed include:

- The extent of, and risks associated with, land clearing and biodiversity (Section 4.5);
- The extent of, and risks associated with, watercourse (including permanent and ephemeral waterholes) disturbance(s) and biodiversity (Section 4.5);
- The extent of, and risks associated with, the project and significant ecosystems (Section 4.5);
- The extent of, and risks associated with, changed fire regime and biodiversity (Section 4.5);
- The extent of, and risk associated with, habitat fragmentation/landscape connectivity and biodiversity (Section 4.5); and
- The extent of, and risks associated with, trenching and biodiversity (Section 4.5), including reference to:
 - the types of fauna, particularly which species are most vulnerable to falling in the trench; and

- the duration and distance for sections of trench to remain open.

6.3.3 Mitigation

Detailed biodiversity management plans, with clear and concise methods, need to be developed in the final Environmental Management Plan. Mitigation and monitoring should be in accordance with best practice advice from relevant NT Government Advisory agencies and focus on:

- Potentially significant impacts to biodiversity (Section 6.3.1) as a whole; and
- Potentially significantly impacted vegetation types, threatened species, migrant species and the biologies of these entities.

6.4 Competing Demand and/or Impacts on Existing Services and Infrastructure

6.4.1 Key Risks

The KGGP project is likely to increase demand and/or impacts on existing services and infrastructure (Section 4.10). The proposed pipeline would intersect a number of roads, watercourses and aquifers.

The EIS should include a detailed assessment of the risks to demonstrate that:

- The Proponent is fully aware of the risks to existing services and infrastructure associated with all aspects of the project;
- The prevention and mitigation of risks to existing services and infrastructure are properly addressed; and
- The Proponent will ensure that the NT infrastructure and service networks are not adversely impacted by the project.

6.4.2 Information Requirements

Aspects to be discussed include:

- The risks and impacts on existing services and infrastructure networks (Section 4.10) as a result of the project, addressing:
 - interruptions to existing and future land use, relevant to service and infrastructure network activities; and
 - how service and infrastructure requirements for the project (Section 3.2.4) would operate with the existing service and infrastructure networks (Section 4.10).

6.4.3 Mitigation

Mitigation measures to protect and safeguard existing service and infrastructure networks (Section 4.10) and provisions for monitoring and responding to the impacts of the project on service and infrastructure networks should be included in the EIS.

Mitigation measures to discuss include:

- Management of interruption to services identified in Section 6.4.2; and
- Management of electrical and telecommunications infrastructure associated with the project to mitigate impact on Australian Defence Force operations (e.g. civil infrastructure, such as lines, electricity substations and telecommunication

facilities, has the potential to interfere with communications, surveillance and navigation equipment).

The Proponent should acknowledge that surface and groundwater extraction licences under the NT *Water Act* are likely to be required. Information on the location of bores (if groundwater is to be used) or river pumps (if surface water is to be used) and monthly water extraction rates at each of these locations will be required in order to assess the water extraction licence applications from a water availability perspective.

6.5 Risks to Water Quality

6.5.1 Key Risks

The proposed pipeline would cross a number of river basins, major rivers, creeks and streams. A range of activities associated with the pipeline construction and operation may cause adverse changes to the quality of surface water and groundwater.

The EIS should include a detailed assessment of the risks to demonstrate that:

- The Proponent is fully aware of the risks to existing surface and groundwater quality and interruption of surface water flows with all aspects of the project; and
- The prevention and mitigation of risks to surface and groundwater quality and surface water flows are adequately addressed.

6.5.2 Information Requirements

Aspects to be discussed include:

- Risks to existing surface (Section 4.7) and groundwater (Section 4.8) quality as a result of the project, with specific reference to components identified in Section 3.2.1;
- Risks to the water quality and hydrology of Crystal Spring from the project; and
- Options for the source and impact of water for hydrotesting and any other construction/ operational water use, together with plans for its disposal after use.

6.5.3 Mitigation

A detailed water management plan, with clear and concise methods, will need to be developed in the final Environmental Management Plan. It is important that the Proponent comprehensively addresses the mitigation measures to protect and safeguard existing surface (Section 4.7) and groundwater (Section 4.8) quality, including:

- Erosion and sediment controls;
- Sediment capture;
- Hydrotest water management;
- Methods to monitor the impacts of the project on surface and groundwater quality; and
- Provisions to notify and respond to environmental and human health risks associated with water quality.

6.6 Social Impacts

6.6.1 Key Risks

Operations associated with the life of the project and increased human activities in the project area have the potential to alter the social demographic, culture and economies of the project area. Assessment and monitoring is required to ensure the local community benefits from the project, and the risks of the project not realising its projected economic and social benefits, are adequately addressed.

6.6.2 Information Requirements

Aspects to be discussed include:

- The extent of, and risks associated with the project and social aspects (Section 5);
- The identification of the nature and magnitude of any potential social impacts, both positive and negative;
- The risks and impacts of the project on regional communities and the economy (Section 3.3); and
- Risks if the project is forced to cease operations earlier than predicted, including the social-economic consequence of this for the surrounding community and potential legacy issues.

6.6.3 Mitigation

A Social Impact Management Plan (SIMP) should be developed as part of the EIS. The SIMP should be an all encompassing document to highlight and mitigate the potential social risks resulting from the project, directly and indirectly. The design and focus of the SIMP should reflect social and community risks specific to the project and include:

- Methods to analyse, monitor and manage the intended and unintended social consequences, both positive and negative, of the project and any social change processes;
- The provision of social and cultural awareness programs and behavioural guidelines to project employees; and
- Mitigation measures to protect and safeguard regional communities and economy (Section 5).

6.7 Historic and Cultural Heritage

6.7.1 Key Risks

Operations associated with the life of the project and increased human activities in the project area have the potential to disturb or damage areas of historic and/or cultural heritage.

The EIS should include a detailed assessment of the risks to demonstrate that the Proponent is fully aware of the risks and mitigation measure to existing areas of historic and cultural heritage value.

6.7.2 Information Requirements

The extent of and risks associated with the project and areas of historic and cultural heritage value (Section 4.11) should be discussed in the EIS.

6.7.3 Mitigation

The Proponent should describe the prevention and mitigation of risks to existing areas of historic and cultural heritage in a Cultural Heritage Management Plan. The plan should:

- Encourage ongoing protection and management of cultural values;
- Describe Indigenous and non-indigenous sites;
- Describe places or objects of historic or contemporary cultural heritage significance; and
- Enable the Proponent to meet its duty of care to protect Aboriginal cultural values.

Advice and permits on the conduct of heritage surveys 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.

6.8 Other Issues

Other environmental impacts should be identified and management strategies proposed, including, but not limited to:

6.8.1 Bushfires

The Proponent should be aware of sections of the *Bushfires Act* and Regulations that apply to the KGGP project and address risk and management of bushfires in Sections 6.2 and 6.3. The development of the Fire Management Plan should be in consultation with traditional owners, pastoralists and their representative organisations, including the NLC, that have specialist knowledge in fire management.

6.8.2 Noise and Vibration

The potential sensitivity of receptors to noise and vibration and mitigation measures should be discussed in a relevant section of the EIS. The Proponent should also address the impact of noise and vibration resulting from the project on residents and the community in a relevant section of the EIS. A Noise Management Plan should outline methods for communicating with, and reducing the impact on, residents within the vicinity of the pipeline who may be affected by the project.

6.8.3 Air Quality

The potential sensitivity of receptors to air quality, including dust, and mitigation measures should be discussed in a relevant section of the EIS. The potential nuisance and human health issues associated with air quality, including dust, and mitigation measures should be discussed in Section 6.3. The Proponent should also assess the impacts of the project on air quality, more broadly, including:

- Possible impacts of the following air quality issues resulting from the project:
 - ambient air quality (in particular the PM10 fraction);
 - dust;
 - odour;

- gaseous emissions including carbon monoxide and oxides of nitrogen; and
- accidental and planned gas releases.
- Measures for monitoring and dealing with gas leakages during operations;
- Dust suppression strategies and monitoring of dust impacts; and
- Meteorological information applicable to air quality in the project area.

6.8.4 Visual Amenity

The extent and significance of the changed landscape on visual amenity during all stages of the project (Sections 3.2 and 3.2.1) should be discussed in a relevant section of the EIS. Aspects of the project that would be visible from key vantage points, publicly accessible areas and areas of significance, such as the Commonwealth Lands Defence, should be discussed.

6.8.5 Greenhouse Gas Emissions

The assessment of the greenhouse gas emissions associated with the project should be discussed in a relevant section of the EIS, including:

- An estimate of emissions of greenhouse gases and ozone depleting substances from vegetation removal and equipment use; and
- Measures by which emissions will be mitigated.

7 Environmental Management

Specific safeguards and controls proposed to be employed to minimise or remedy environmental impacts identified in previous sections are to be included in an Environmental Management Plan (EMP) or similar plan.

The EMP should be strategic, describing a framework for environmental management of the project. However, as much detail as is practicable should be provided to enable adequate assessment of the proposal during the public exhibition phase. Specific management practices and procedures should be included in the EMP, where possible.

The EMP should include:

- The proposed management structure of the operation and its relationship to the environmental management of the site;
- Management targets and objectives for relevant environmental factors;
- The proposed measures to minimise adverse impacts and maximise opportunities, including environmental protection outcomes;
- Performance indicators by which all anticipated and potential impacts can be measured;
- Proposed monitoring programs to allow early detection of adverse impacts;
- Information on how the land will be managed if it is taken out of production;
- Describe contingencies for events, such as the leakage of the pipeline;
- The EMP needs to address the project phases (construction, operation, decommission) separately. It must state the environmental objectives,

performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue;

- The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program;
- A summary table listing the undertakings and commitments made in the EIS, including clear timelines for key commitments and performance indicators, with cross-references to the text of the EIS; and
- Provision for the periodic review of the EMP itself.

Reference should be made to relevant legislation, guidelines and standards, and proposed arrangements for necessary approvals and permits should be noted. Proposed reporting procedures on the implementation of the plan, independent auditing or self-auditing and reporting of accidents and incidents should be included. The agencies responsible for overseeing implementation of the EMP should be identified.

The EMP would continue to be developed and refined following the conclusion of the assessment process, taking into consideration the proposed timing of development activities, comments on the EIS and incorporating the Environmental Assessment Report recommendations and conclusions.

8 Public Involvement and Consultation

The EIS has an important role in informing the public about the KGGP project. It is essential that the Proponent demonstrate how any public concerns were identified, and will influence the design and delivery of the KGGP project. Public involvement and the role of government organisations should be clearly identified. The outcomes of any surveys, public meetings and liaison with interested groups should be discussed including any changes made to the proposal as a result of consultation. Details of any ongoing liaison should be discussed.

9 Guidance Notes

9.1 Environmental Offsets

The Australian Government Environmental Offsets Policy, October 2012 requires residual (after avoidance and mitigation measures have been implemented) significant impacts to be offset, with a focus on direct offsets. The Offsets assessment guide, which accompanies this policy, has been developed to give effect to the policy's requirements, utilising a balance sheet approach to quantify impacts and offsets. It applies where the impacted protected matter is a threatened species or ecological community. These documents are available at:

<http://www.environment.gov.au/epbc/publications/environmental-offsets-policy.html>.

The EIS should provide information on:

- Any identified impacts or detriments that cannot be avoided, reduced or mitigated at reasonable costs and whether these impacts could be considered as 'significant' under the EPBC Act;
- Risks of failure of management actions (such as rehabilitation, weed control, etc.) and uncertainties of management efficacy should be identified; and
- Proposed offsets for residual significant impacts to listed threatened species or ecological communities and listed migratory species and an explanation as to

how these proposed offsets meet the requirements of the Environmental Offsets Policy and Offsets assessment guide, where relevant.

9.2 Public Health Premises and Food Premises

NT Department of Health will require detailed plans submitted via a building certifier, prior to construction, if shops or accommodation facilities are to be provided on the project site.

Further information from the NT Department of Health are provided in fact sheet 700 *Requirements for Mining and Construction Projects*.

9.3 Water Supply

All workings of the project require the provision of an adequate potable water supply. All water supplies collected from groundwater must be at least 100 m from any effluent drainage system or other water bodies as described in the *NT Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent (The Code)*.

9.4 Wastewater

NT Department of Health will require a notification to install a waste water treatment system outside of a building control area if a new effluent treatment system is to be installed to treat effluent. Any waste water treatment system(s) installed on-site shall be capable of collecting, treating and disposing of waste water on-site in accordance with the Code.

Further information can be found at:

www.health.nt.gov.au/Environmental_Health/Wastewater_Management.

Any discharge of wastewater from the project area into tidal waters, groundwaters or waterways may require licensing under the NT *Water Act*. Guidance and application forms can be found at:

www.ntepa.nt.gov.au.

9.5 Mosquito Breeding

Reference to the Medical Entomology, Department of Health guidance documentation regarding biting insect management is located at:

http://health.nt.gov.au/Medical_Entomology/Publications/Development_Guidelines/index.aspx.