Darwin to Moomba Gas Pipeline

Preliminary Survey Licence

Environmental Impact Report

March 2001

epic energy

Contents

List of Tables

List of Figures

Executive Summary

Epic Energy proposes to construct a pipeline to transport natural gas from Darwin to Moomba via an approximate 2200 kilometre underground pipeline. The gas will be sourced from the Bayu-Undan field in the Timor sea for delivery to Moomba for gas distribution and retailing, gas aggregation and power generation industries.

This Environmental Impact Report has been prepared in support of an application for a Preliminary Survey Licence (PSL) to allow land survey activities to be conducted in a 20km wide corridor for the final 200km of the pipeline which is located within South Australia.

This document outlines the environmental hazards associated with the preliminary survey activities and identifies the following potential consequences:

- Landowner disturbance;
- Damage to crops / pasture;
- Disturbance to stock;
- Dust generation;
- Weed / disease introduction;
- Soil Disturbance;
- Disturbance to cultural heritage sites;
- Damage to native vegetation and wildlife habitats;
- Visual impacts; and
- Fire risk.

Mitigation strategies have been proposed and all impacts have been assessed as being of **low significance**, based on their high degree of predictability and manageability.

1 Introduction

1.1 Background

Epic Energy proposes to construct a pipeline to transport natural gas from Darwin to Moomba via an approximate 2200 kilometre underground pipeline. The final 200 kilometres of the pipeline is located within South Australia (refer to Figure 1). The gas will be sourced from the Bayu-Undan field in the Timor sea for delivery to Moomba for gas distribution and retailing, gas aggregation and power generation industries.

Epic Energy are currently seeking a Preliminary Survey Licence (PSL), to allow land survey activities to be conducted in a 20km wide corridor for the final 200km of the pipeline.

1.2 Regulatory Framework

In order to adequately plan the project, Epic Energy and its contractors require access to the land within the project area, to conduct preliminary surveys.

Preliminary survey activities associated with a proposed pipeline are "regulated activities" under Section 10 of the Act and as can only be conducted under a PSL. The licencing process for preliminary surveys is separate from that of the pipeline licence and requires the preparation of a separate EIR and SEO.

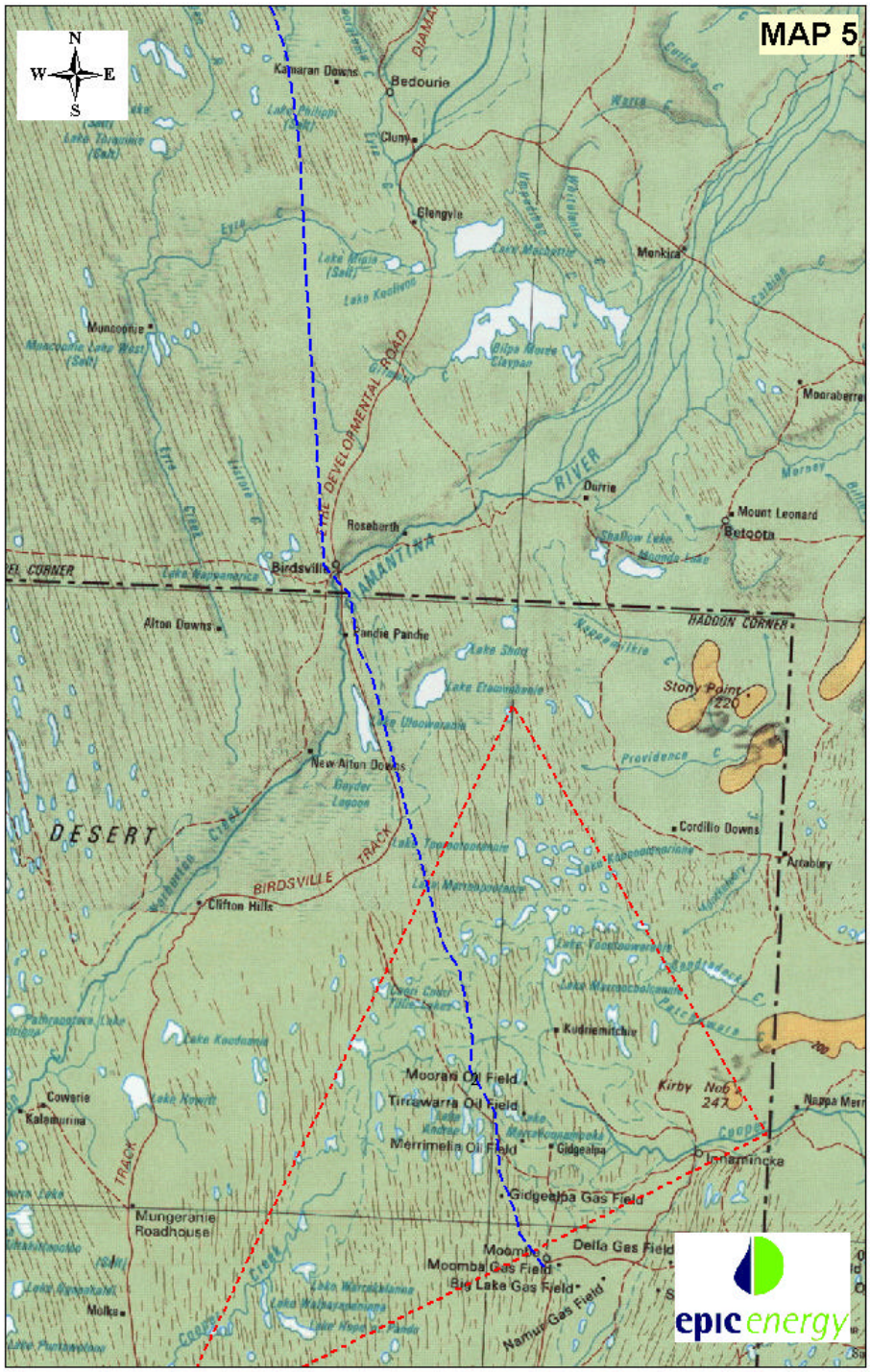
1.3 About this Document

This document is the EIR prepared in support of the application for a Preliminary Survey Licence for the South Australian section of the Darwin to Moomba Pipeline. The document:

- **Describes the preliminary survey activities (Section 2);**
- **Describes the specific features of the environment that can reasonably be expected to be affected by the activities (Section 3);**
- **Identifies potential environmental hazards and consequences (Section 4); and**
- **Proposes measures to mitigate potential consequences (Section 4).**

The document also outlines the proposed environmental objectives that Epic Energy commit to achieving. These objectives have been identified on the basis of the potential hazards and consequences highlighted by this assessment and are carried over into the accompanying SEO.

Figure 1: Location of Project Area



1.4 About Epic Energy

Epic Energy is one of Australia's largest transmission companies, with more than $3.5 billion invested in energy infrastructure. Epic Energy owns 3,300km of pipeline in Australia and operates another 891km on behalf of other owners. Epic Energy's major transmission pipelines are:

- **The Dampier to Bunbury Natural Gas Pipeline in Western Australia;**
- **The South West Queensland Pipeline in Queensland; and**
- **The Moomba to Adelaide Pipeline system in South Australia.**

Epic Energy's gas customers include base load electricity generators, gas distribution companies and industrial users.

Epic Energy was established in 1994 and employs more than 250 people. Major shareholders in the company are El Paso Energy Corporation, Consolidated Natural Gas Company, AMP Asset Management Australia Limited, Deutsche Asset Management (Australia) Limited and Hastings Funds Management Limited.

1.5 Environmental Commitment

Epic Energy is committed to responsible environmental management of all phases of the Darwin to Moomba Pipeline project. All planning, construction and operation activities will be conducted in accordance with Epic Energy's Environmental Policy (refer Appendix 1). Epic Energy is committed to achieving the environmental objectives outlined in the SEO.

2 Preliminary Survey Activities

As part of the engineering and environmental planning for the Darwin to Moomba Pipeline, Epic Energy and its contractors will undertake a land survey activities.

2.1 Land Survey

The proposed pipeline alignment will need to be identified both physically in the field and legally on maps, plans and land titles. To enable this a number of activities will need to be conducted during the preliminary survey phase of the project, including:

- **Installing marker pegs at regular intervals. These will usually be installed adjacent to fencelines and at bends in the proposed alignment. Minimal equipment is required for this task, and is limited to the access vehicle[1], wooden pegs, flagging tape and hand tools (eg. hammer).**
- **Recording the legal (or cadastral) location of the alignment. This may not be undertaken until after construction, and so may be covered by the Pipeline Licence. However, there is a possibility that during the preliminary survey phase, licenced land surveyors may undertake site work. Minimal equipment is required for this task and is limited to the access vehicle, survey equipment (such as theodolite and survey rule) and hand tools.**

No excavation work will be necessary for the land survey activities.

[1] **Access vehicles, unless otherwise stated, are standard four-wheel drives (Toyota Landcruiser or similar).**

3 Existing Environment

The project area lies in the north eastern corner of South Australia (refer to Figure 1). It is intended that the proposed pipeline route will run south from the Northern Territory border within the vicinity to the Birdsville Track. The pipeline will continue in a south south east direction through the Coongie Wetland area to Moomba. It is intended that the pipeline route though this area will be selected to utilise areas of previous disturbance as far as practicable. The length of the pipeline within South Australia is approximately 200km.

As the project is still in the planning phase, it is not the intention of this EIR to provide a detailed description of the existing environment of the project area. Detailed investigations regarding the environment of the project area will be undertaken as part of the environmental impact assessment process.

The project area is described largely by the relevant land systems as derived from Marree District Soil Management Plan (PIRSA). The key land systems associated with the project area are:

- **Kertietoonga Dune System,**
- **Diamantina Floodplain System,**
- **Koonchera Gibber Plain System, and**
- **Cooper Watercourse and Outwash Plains System.**

3.1 Land Systems

3.1.1 Kertietoonga Dune Systems

The Kertietoonga land system is dominated by dunefields, swamps and lakes overlying the outer floodplains of the Cooper and Diamantina system. The dunefields are characterised by parallel dunes of red, yellow or white sands, separated by flat interdune corridors which are sometimes the site of clay pans.

The dunes tend to be red siliceous sands, with semi-mobile crests in places. Perennial cover is sandhill canegrass and lobed spinifex hummock grassland with scattered sandhill wattle and narrow-leaved hopbush. Tall kerosene grass and herbs tend to appear with rain.

The interdunal area tends to vary from sands to sandy clays or red sandy clay loam. These sands carry lobbed spinifex and tall shrubs. Clayey flats have perennial shrubland of starbush and blackbush with neverfail.

The lakes within the area are ephemeral and when dry, carry copperburrs on a silty massive clay. The lakes tend to be bordered by grey clay or clay loam soils with coolibah over a samphire or lignum shrubland.

3.1.2 Diamantina Flood Plains

The Diamantina Flood Plains dominate the area surrounding the Diamantina River. The floodplains are characterised by deep grey self-mulching clays and are overlain by dunes in places. The floodplains and channels are fringed by woodlands of river red gum, coolibah, gidgee and bean tree with understoreys of lignum and chenopod shrubland and grasses.

Channels within the area, depending on the degree and frequency of flooding, may have a cover of rat's tail couch or a mixture of Queensland bluebush, and ephemeral herbs and forbs. Terraces or levees have sparse woodland of coolibah, with elegant wattle, kerosene grasses and ephemeral herbs.

The small dunes present are characterised by tall shrubland and hummock grasses of sandhill canegrass and lobed spinifex or ephemeral grassland of very sparse kerosene and mulga grasses.

3.1.3 Koonchera Gibber Plains

The Koonchera Gibber Plains are overlain by widely spaced longitudinal dunes, with areas of sandsheets. Soils tend to have a gilgai development. Gilgais are red cracking self-mulching clays with little or no stone, while the surrounds are duplex soil of a shallow friable loam over red clays with a dense cover of gibber.

Vegetation is concentrated in and on the margins of gilgais. Gilgais are generally treeless, with a mixed groundcover of perennial grasses. Ephemeral species will often appear after rain. Large gilgai areas receiving extended runoff may have a cover of lignum, common nardoo and occasionally swamp canegrass and pale spike-rush.

Vegetation of the gibber shelves is sparse, largely ephemeral and may totally disappear in drought. Shallow sandsheets and spreads over the gibber will support some perennial vegetation away from the gilgais. Deeper sand spreads tend to have an open tall shrubland of sandhill wattle with Oswald's wattle while groundcover tend to be ephemeral.

The stony tableland plateaus have similar soil to the lower areas, but with less gilgai development and more gibber cover with some gypcrete or silcrete outcropping. The vegetation is sparse low open shrubland of bluebush, shruby twinleaf and black bluebush with some grasses.

The sandridges are deep red siliceous sands, the larger with mobile crests and sandhill canegrass, and the lower with less mobility and sandhill wattle. The vegetation tends to be variable, although sandhill canegrass is always present on upper slopes and crests. Other vegetation may include lobed spinifex tall open shrubland of sandhill wattle and ephemeral ground cover of mulga and kerosene grass.

The internally draining lakes and claypans have clay soils, which seal when wet and support little or no vegetation. Some areas have cracking clays, and will support vegetation depending of the frequency of inundation.

3.1.4 Cooper System

This land system is the dominant land system in the proposed project area. The land system is dominated by the waterholes, channels, floodplains and ephemeral lakes of the Cooper and Strzelecki Creeks. This system includes the Coongie Lakes area, which receive water from the north-west branch of the Cooper Creek.

The dunes in this area vary from red siliceous sands to whitish siliceous sands. The red dunes are older and may have a clayey core. The paler dunes tend to be recent deposition from the floodplains and are more mobile.

The major waterholes in the area are effectively permanent and support tall woodland of river red gum and coolibah. There is usually an understory of lignum with a groundcover of short-lived perennials or annuals. The channels and temporary waterholes tend to have an overstorey primarily of coolibah, with an occasional river red gum and cooba. Lignum stands are present on the pale grey self-mulching cracking clays.

Extended flats tend to be located behind the channels and extend into pale dunes, typically made up of pale sandy clay with a veneer of pale grey sands. There are also some areas of grey self-mulching cracking clay soils, which allow for greater water penetration. Vegetation is dominated by woodland of coolibah with whitewood and spotted embush. A shrub layer and annuals including buckbush and onionweed may also be present.

The gilga flats are pale grey self-mulching cracking clays, with gilgai formation and variable cover. Large clay interdune corridors have similar soils and vegetation. Chenopod shrubland of queensland bluebush dominates, with some canegrass or lignum.

The sandplains of the area are made of sandy loam soils with a hardsetting layer. They support a low open woodland including whitewood, prickly wattle and some coolibah over mixed grass and sub shrub groundcover.

3.2 Land Use

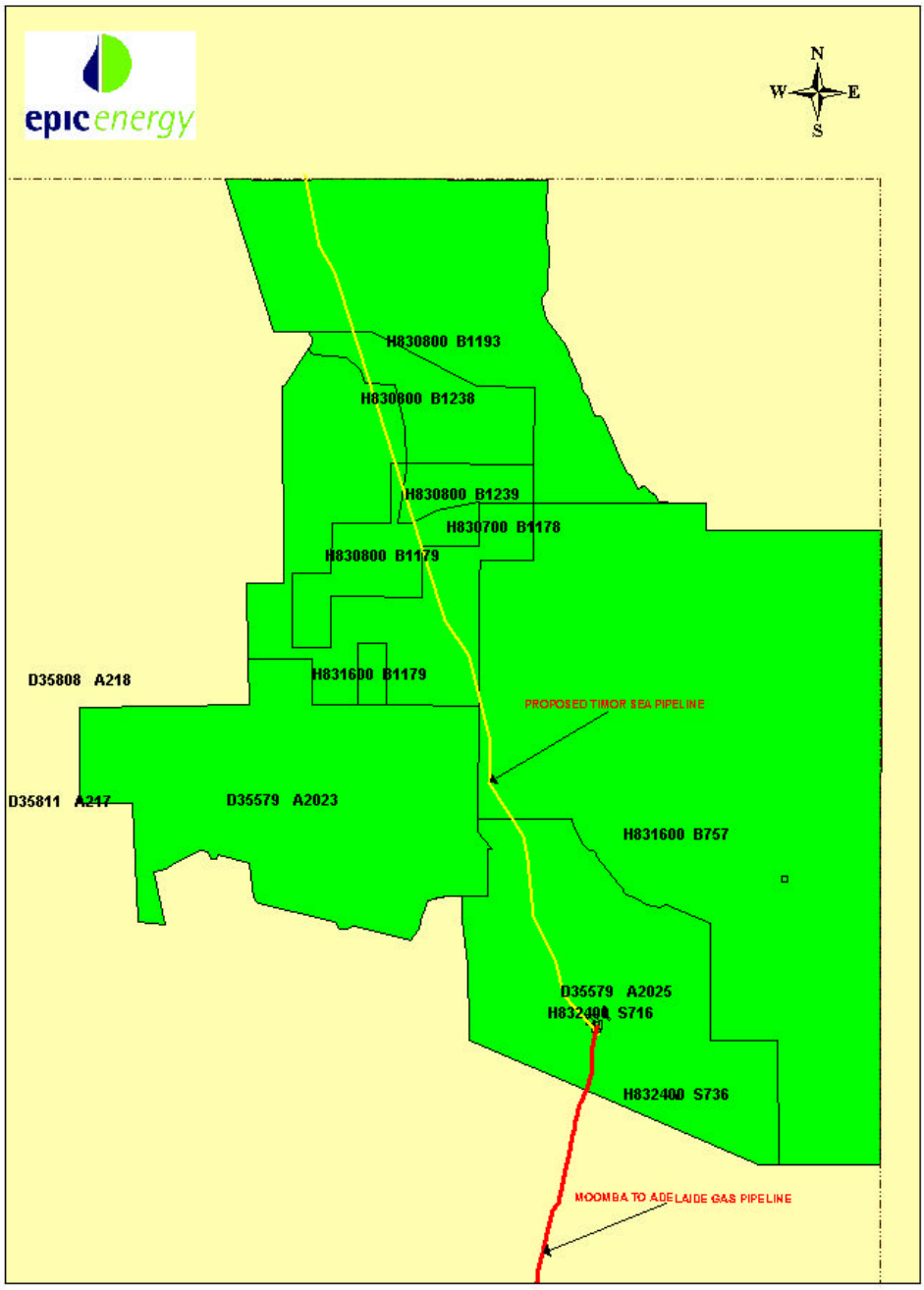
Agriculture is the dominant landuse within the area, while the area also supports mining, tourism and oil and gas exploration and production. The proposed project area includes the Coongie Wetland and the Innamincka Regional Reserve, which is a multi-use reserve. The Reserve allows for biological conservation, pastoral use and oil/gas and mineral exploration and production, with controls.

Land parcels are medium to large and as a result the population density is to low. The proposed alignment crosses approximately 9 properties. In accordance with Regulation 10(1)(e), all landowners that may be impacted by the preliminary survey work are listed in Appendix 2[2]. The land tenure of the proposed project area is illustrated on Figure 2.

---

[2] **It should be noted that only landowners on the proposed alignment are listed, as it is considered impractical and unnecessary to list all landowners in the area to be covered by the**

Figure 2: Land Title Map for Proposed Pipeline



PSL. Should it be necessary to access additional lands (eg. as a result of an alignment change), PIRSA will be notified in writing.

3.3 Cultural Heritage

The proposed project area is located in a region of South Australia that has evidence of both European and Aboriginal history. Cultural heritage databases/records were not searched as part of this assessment, due to the limited potential for preliminary survey activities to impact sites of significance and because a detailed cultural heritage survey will for part of the pre-construction activities.

4 Environmental Hazards, Potential Consequences and Management Strategies

The environmental hazards associated with the preliminary survey activities and their potential consequences are outlined in Table 1. Strategies to mitigate potential consequences and the proposed environmental objectives to be achieved are outlined in Table 2.

The content of these tables has been compiled to meet the requirements of Regulation 10(1). In particular, the tables:

- **List the activities to be conducted as part of the preliminary survey that have the potential to result in environmental impact;**
- **Identify the hazards associated with these activities including atypical hazards;**
- **Provide an indication of the frequency of hazards;**
- **Identify potential consequences and their expected duration;**
- **Outline mitigation measures.**

In addition, Regulation 10(1) requires:

- **an explanation of the basis on which the hazards and their frequency and consequence have been predicted (see below);**
- **an assessment of the extent to which consequences can be addressed.**

These requirements are addressed below.

Prediction of Hazards and Frequency and Consequence

Records of potential hazards and consequences associated with preliminary survey activities are not well documented. Hazards and consequences have therefore been identified by engineering, lands and environmental staff of Epic, based on first had industry experience gained over many years.

Preliminary survey activities are conducted over a short period. The frequency with which hazards occur can be confidently estimated based on the number of occasions that the activities occur.

Table 1: Potential Environmental Hazards and Consequences

Activity	Hazard	Frequency	Potential Consequence	Duration of Consequences
Land Survey	Helicopter flight over proposed route	▪ Once per property	▪ Landowner disturbance	▪ Less than half a day per property.
			▪ Disturbance to stock	▪ Less than half a day per property.
	Vehicle access	▪ Initial alignment pegging - once per property. ▪ Cadastral survey - once per property.	▪ Landowner disturbance	▪ Approximately half a day per property.
			▪ Damage to crops / pasture (restricted to vehicle wheel tracks)	▪ One year.
			▪ Disturbance to stock	▪ Approximately half a day per property.
			▪ Disturbance to cultural heritage sites	▪ Permanent.
			▪ Dust generation	▪ Approximately half a day per property.
			▪ Fire	▪ One season.
			▪ Weed / disease introduction	▪ Possibly long term (>5yrs).
	Installation of alignment markers	▪ Once per property.	▪ Visual impacts	▪ Up to six months.
	Set-up of survey equipment	▪ Once per property.	▪ Damage to native vegetation	▪ Permanent loss of some foliage.

Table 2: Environmental Objectives and Mitigation Strategies

Potential Consequence	Environmental Objectives	Issue Specific Mitigation Strategies	Extent to which consequence can be addressed	Significance of Consequence
▪ Landowner disturbance	▪ To minimise disturbance to landowners.	▪ Appoint Lands Officer with specific responsibility for maintaining contact with all potentially affected landowners. ▪ Consult with landowners prior to preliminary survey activities to identify specific requirements. ▪ Accommodate landowners' specific requirements wherever practicable. ▪ Advise landowners of the scope, schedule and duration of preliminary survey activities. ▪ Plan / rationalise preliminary survey activities to ensure the number of site visits is as few as practicable. ▪ Provide landowners with adequate prior notice of proposed land access.	Adverse consequences can be managed in the short term.	LOW
▪ Damage to crops / pasture	▪ To minimise damage to crops and pasture.	▪ Plan / rationalise preliminary survey activities to ensure the number of site visits is as few as practicable. ▪ Use existing tracks where available. ▪ Restrict disturbance to proposed construction right-of-way where practicable.	Adverse consequences can be managed in the short term.	LOW
▪ Disturbance to stock	▪ To minimise disturbance to stock.	▪ Plan / rationalise preliminary survey activities to ensure the number of site visits is as few as practicable. ▪ Consult with landowners prior to preliminary survey activities to identify specific requirements. ▪ Provide landowners with adequate prior notice of proposed land access. ▪ Drive vehicles at appropriately slow speeds to avoid undue disturbance. ▪ Leave gates as found.	Adverse consequences can be managed in the short term.	LOW

Potential Consequence	Environmental Objectives	Issue Specific Mitigation Strategies	Extent to which consequence can be addressed	Significance of Consequence
▪ Dust generation	▪ To minimise generation of dust.	▪ Plan / rationalise preliminary survey activities to ensure the number of site visits is as few as practicable. ▪ Drive vehicles at appropriately slow speeds to avoid undue disturbance.	Adverse consequences can be managed in the short term.	LOW
▪ Weed / disease introduction	▪ To avoid the introduction of weeds or disease.	▪ Identify local weed and disease management issues prior to the commencement of preliminary survey activities. ▪ Ensure all vehicles and equipment are free of soil and vegetative matter prior to entry to and exit from properties. ▪ Plan / rationalise preliminary survey activities to ensure the number of site visits is as few as practicable. ▪ Consult with landowners prior to preliminary survey activities to identify specific requirements.	Adverse consequences can be avoided or it is highly unlikely that they will occur.	LOW
▪ Damage to native vegetation and wildlife habitats	▪ To avoid or minimise damage to native vegetation and wildlife habitats.	▪ Prohibit clearing native vegetation as part of land survey.	Adverse consequences can be avoided or it is highly unlikely that they will occur.	LOW
▪ Disturbance to cultural heritage sites	▪ To avoid damage or unnecessary disturbance to cultural heritage sites.	▪ Survey work to be undertaken by appropriately trained and experienced personnel. ▪ Report and respond to any sites discovered during pipeline survey activities. ▪ Any sites shall be recorded for subsequent avoidance during construction.	Adverse consequences can be avoided or it is highly unlikely that they will occur.	LOW
▪ Soil Disturbance	▪ To minimise soil disturbance.	▪ Prohibit any excavation activity as part of the land survey. ▪ Vehicles to use existing road tracks where practicable.	Adverse consequences can be avoided or it is unlikely that they will occur.	LOW
▪ Visual impacts	▪ To minimise visual impacts.	▪ Limit the use of marker pegs to those essential for identifying the proposed alignment. ▪ Install marker pegs on fencelines, where practicable.	Adverse consequences can be avoided or it is highly unlikely that they will occur.	LOW

Potential Consequence	Environmental Objectives	Issue Specific Mitigation Strategies	Extent to which consequence can be addressed	Significance of Consequence
▪ **Fire**	▪ **To minimise the risk of fire.**	▪ **Diesel vehicles shall be used where practicable.** ▪ **Fire extinguishers and/or other knapsacks to be kept in all vehicles.** ▪ **No smoking.**	**Adverse consequences can be avoided or it is highly unlikely that they will occur.**	**LOW**

4.1 Mitigation Strategies

In addition to the issue specific mitigation strategies outlined in Table 2, Epic Energy will implement the following general management procedures:

Awareness Program

All personnel involved with field-based preliminary survey activities will be provided with a copy of Tables 1 and 2 of this EIR. Epic Energy will ensure that all personnel are adequately aware of the relevant impact mitigation strategies.

Job Environmental Analysis

Epic Energy will subject preliminary survey activities to Job Environmental Analysis[3]. The Lands Officer will coordinate the JEA process.

Contractual Obligations

All contacts with companies undertaking preliminary survey activities for Epic Energy on the Darwin to Moomba Pipeline project will include a requirement to:

- **Operate in a manner consistent with Epic Energy's Environmental Policy; and**
- **To adopt mitigation strategies outlined in this EIR.**

Reporting

Any complaints from landowners that arise as a direct result of preliminary survey activities will be recorded by the Lands Officer and reported to the Epic Energy Lands and Environmental Manager.

4.2 Significance of Consequences

A subjective assessment has been made of the significance of the potential environmental consequences, using the methodology outlined in PIRSA (2000), which proposes an assessment based on the following criteria:

- **The predictability (or certainty) of hazards and consequences, with regard to their:**
  - **size, scope, duration, likelihood and stakeholder concerns; and**
- **The degree to which consequences can be managed in relation to:**
  - **being avoided, likelihood of occurring, duration; size and scope, cumulative effects and stakeholder concerns.**

---

[3] **Job Environmental Analysis is a system used by Epic Energy to ensure all potential hazards and consequences are identified and mitigation measures (including implementation strategies) are identified and recorded by field staff.**

The result of the assessment was that all potential impacts were of LOW significance on the basis that:

Predictability criterion significance score = 1
i.e. All hazards and consequences can be accurately predicted to a high level of confidence.

Manageability criterion significance score = 1 or 2
i.e. Adverse consequences can be avoided or it is highly unlikely that occur. Or
Adverse consequences can be managed in the short term.

5 Consultation

No consultation with external stakeholders has been conducted as part of the preparation of this EIR. However, during the preliminary survey activities, planning, design and pre-construction phases, Epic Energy will consult with:

- **State Government Departments (in particular PIRSA, Department of Environment and Heritage and Department of Water Resources).**
- **Landowners/Leaseholders.**
- **Relevant non-government organisations (eg. local conservation groups, farmers groups, Aboriginal communities, native title claimants).**

References

The following references were reviewed as part of the preparation of the EIR:

Ecos Consulting (Aust) 2001. *AMCOR Lateral Pipeline, Preliminary Survey Licence, Statement of Environmental Objectives.* **Unpublished Report to Epic Energy.**

Petroleum Group (PIRSA) (2000) *Criteria for Classifying the Level of Environmental Impact of Regulated Activities: Requirements under Part 12 Petroleum Act 2000***. http://www.pir.sa.gov.au**

Description of the relevant Land Systems were derived from:

Primary Industries and Resources South Australia. *Marree District Soil Conservation Plan.* **http://www.soil.pir.sa.gov.au**

Abbreviations

EIR	**Environmental Impact Report prepared in accordance with Section 97 of the** *Petroleum Act 2000* **and Regulation 10.**
JEA	**Job Environmental Analysis**
km	**Kilometre**
mm	**Millimetre**
PIRSA	**Primary Industries and Resources, South Australia**
PSL	**Preliminary Survey Licence issued in accordance with Section 10 of the** *Petroleum Act 2000.*
SEO	**Statement of Environmental Objectives prepared in accordance with Section 99 and 100 of the** *Petroleum Act 2000* **and Regulations 12 and 13.**

Appendix 1

Environmental Policy

Appendix 2

Landowner List

Landowners whose property is traversed by the proposed pipeline and who may be affected by preliminary survey activities:

Title Reference	Landowner
H 830800 B1193	Crown Leasehold
H 830800 B1238	Crown Leasehold
H 830800 B1239	Crown Leasehold
H 830700 B1178	Crown Leasehold
H 830800 B1179	Crown Leasehold
H 831600 B757	Innamincka Regional Reserve
D 35579 A2025	Dept of Lands (Crown Leasehold)
H 832400 S716	Cooper Basin Trust
H 823400 S736	Fee Simple Entirety