Coopers Lateral Pipeline

Pipeline Licence Extension

Environmental Impact Report

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epic energy

ecos CONSULTING (AUST) PTY LTD

Prepared for:

Epic Energy SA Pty Ltd
(ACN 068 599 815) PO Box 698
26 High Street
DRY CREEK
South Australia 5094

Prepared by:

Ecos Consulting (Aust) Pty Ltd
ABN 57 081 918 194
26 Greenhill Road
WAYVILLE
South Australia 5034

ph: (08) 8357 0400
fax: (08) 8357 0411
ecos@ecos.com.au
www.ecos.com.au

Cover Image: Western aspect of HEP Drainage Reserve, facing north along Naweena Road, Regency Park

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Table of Contents

List of Tables

List of Figures

Appendices

Executive Summary

Epic Energy SA Pty Ltd plan to construct a 4.5km pipeline to supply natural gas to the Coopers Brewery located at the corner of South and Regency Roads, Regency Park. The pipeline (referred to as the Coopers Lateral Pipeline) will connect to the Moomba Adelaide Pipeline from a hot-tap within the constructed Barker Inlet Wetlands (Figure 1).

This Environmental Impact Report (EIR) has been prepared in support of an application for an extension of Epic Energy's existing Moomba to Adelaide Pipeline Licence No. 1 to include the proposed Coopers Lateral Pipeline. The Moomba to Adelaide Pipeline Licence No.1 currently includes the main Moomba to Adelaide pipeline and a number of associated extensions, laterals and loopings.

Environmental hazards associated with the construction and operation of the Coopers Lateral Pipeline are:

- Sedimentation of adjacent surface waters
- Weed / disease spread
- Minor damage to native vegetation, and
- Erosion of soils.

Appropriate management strategies will ensure no adverse effects result from construction of the pipeline. These will include:

- Restriction of construction activities to the 25m construction right-of way
- Vegetation clearance will be kept to a minimum
- Washdown procedures will occur prior to the commencement of construction activities
- Siltation fences will be erected as required, and
- Topsoil and subsoil will be stockpiled separately.

The EIR provides detail on the general mitigation strategies that address each of the above potential impacts. Detailed task-specific

management and mitigation requirements will be included in an Environmental Management Plan.

A Statement of Environmental Objectives has been developed in conjunction with this EIR, which outlines the environmental objectives that Epic Energy are required to achieve and the criteria upon which objectives shall be assessed.

1 Introduction

1.1 Background

Epic Energy SA Pty Ltd (Epic Energy) plan to construct a pipeline to supply natural gas to the Coopers Brewery at the corner of South and Regency Roads, Regency Park. The pipeline, referred to as the "Coopers Lateral Pipeline", will be in the order of 4.5km long, commencing at the Moomba Adelaide Pipeline, north of Cormack Road, Wingfield, and terminating at a meter station in the southeast corner of the Coopers Brewery site (Figure 1).

Epic Energy currently own and operate the Moomba to Adelaide Pipeline under Pipeline Licence No.1, which authorises operation of the Moomba to Adelaide Pipeline and a number of pipeline extensions, laterals and loopings. It is proposed that the Coopers Lateral Pipeline be similarly authorised as an extension to Pipeline Licence No.1.

1.2 Regulatory Framework

To support an application for the Moomba to Adelaide Licence No. 1 extension, Epic Energy must prepare:

- **An Environmental Impact Report (EIR) - in accordance with Section 97 of the South Australian** *Petroleum Act 2000* **(the Act) and Regulation 10 of the** *Petroleum Regulations 2000* **(the Regulations); and**
- **A Statement of Environmental Objectives (SEO) - in accordance with Section 99 and 100 of the Act and Regulations 12 and 13.**

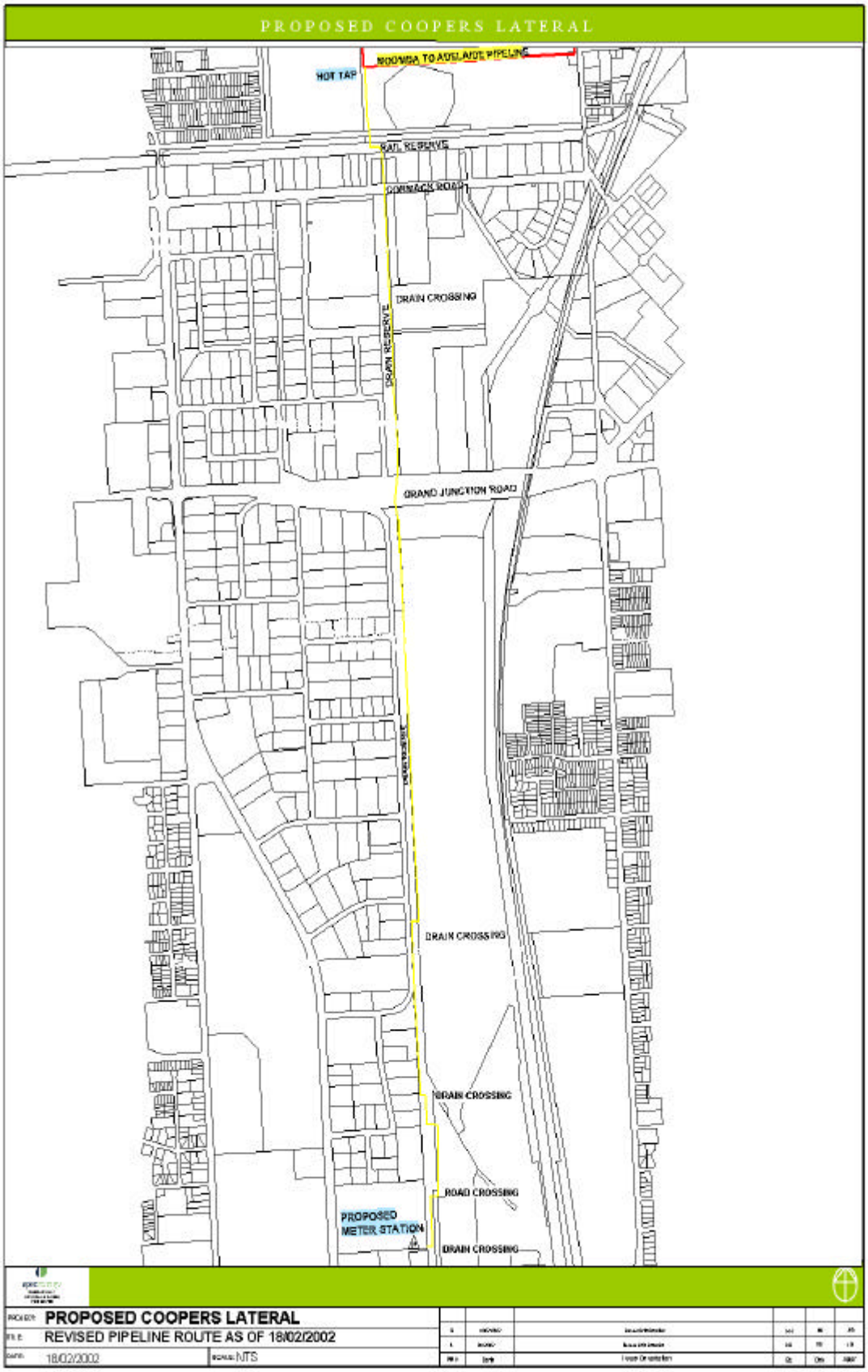
This document fulfils the requirements of an EIR as outlined in the *Petroleum Act* **and** *Regulations***.**

1.3 About This Document

This EIR has been prepared as a component of Epic Energy's application for an extension of Pipeline Licence No.1 to include the proposed Coopers Lateral Pipeline. The document:

- **Provides a description of the Coopers Lateral Pipeline project (Section 2);**
- **Describes the specific features of the environment that can reasonably be expected to be affected by pipeline construction and operation activities (Section 3);**
- **Identifies potential environmental impacts and consequences (Section 3);**
- **Proposes measures to mitigate potential environmental impacts and consequences (Section 3); and**
- **Summarises stakeholder consultation (Section 4);**

Figure 1: Proposed Coopers Lateral Pipeline Route.



An SEO has been developed in conjunction with this EIR and outlines the environmental objectives that Epic Energy is required to achieve and the criteria upon which the objectives are to be assessed. The SEO has been developed on the basis of information provided in this EIR.

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 3,400km 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 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 Management System

Epic Energy has developed and implemented a detailed Environmental Management System (EMS) which applies to all of Epic Energy's activities. Epic Energy is committed to responsible environmental management of all phases of the Coopers Lateral Pipeline project. The following section details the key components of the Environmental Management System that are relevant to the Coopers Lateral Pipeline.

1.5.1 Environmental Commitment

All planning, construction and operation activities will be conducted in accordance with Epic Energy's Environmental Policy (Appendix A). Epic Energy is committed to achieving the environmental objectives outlined in the corresponding SEO.

1.5.2 Environmental Management Plans

Epic Energy shall develop an Environmental Management Plan (EMP) for the construction of the Coopers Lateral Pipeline. The EMP contains detailed task-specific control measures to ensure that the environmental objectives for the project will be met. The EMP also details how environmental issues will be managed during pipeline construction including:

- **Responsibilities;**
- **Induction and Training;**
- **Inspection, Monitoring and Auditing;**
- **Consultation; and**

- **Reporting**

Epic Energy's EMP Operations details the environmental control measures for pipeline operations. Implementation of these measures will ensure that SEO objectives for operations are met.

1.5.3 Job Environmental Analysis

Prior to the commencement of each construction activity (eg. clear & grade, trenching), a Job Environmental Analysis (JEA) will be completed. The JEA will identify the specific environmental objectives and hazards associated with the particular type of construction activity and will receive approval from Epic Energy prior to the commencement of the activity.

JEA's will also be completed during pipeline operations for activities that could potentially have a significant impact on the environment.

Completed and approved JEA's are a designated hold and witness point in Epic Energy's inspection and test plan.

1.5.4 Environmental Monitoring Stations

Environmental Monitoring Stations (EM Stations) will be installed at representative locations along the pipeline construction route, as required. Photographs will be taken along the easement at each location prior to construction, during construction and immediately following restoration. EM Station locations and records will be maintained during operations as part of Epic Energy's EMS.

2 Project Description

2.1 Coopers Lateral Pipeline Alignment

The proposed pipeline will be approximately 4.5km long and commence at the Moomba Adelaide Pipeline located approximately 400m north of Cormack Road, Wingfield. The route travels south from the Moomba Adelaide Pipeline located within the southern aspect of the constructed Barker Inlet Wetlands. The proposed route continues along north-south aligned *Hindmarsh, Enfield, Prospect Drainage Authority* **(HEP) drainage reserve within the light industrial areas of Wingfield and Regency Park, crossing Cormack and Grand Junction Roads and Gallipoli Grove.**

From the Moomba Adelaide Pipeline the pipeline route proceeds south along an access track within the constructed Barker Inlet Wetlands and crosses to the east of the drainage reserve at the railway track. The route continues south and crosses under Cormack Road to the eastern side of the drainage reserve (refer Plate 1 and Plate 2). The route continues south through drainage reserve, crossing under Grand Junction Road (refer Plate 3) and crosses to the western side of drainage reserve at the National Rail Corporation Freight Yard (refer Plate 4 and Plate 5). The route continues south before crossing to the eastern aspect of the reserve and continuing through Sunnybrae Pony Club access road reserve (refer Plate 6). The pipeline crosses to the west of Gallipoli Grove, and continues along the eastern side of drainage reserve before crossing to the western side and terminating at a meter station (KP 4.3258) in the southeast corner of the Coopers Brewery, Regency Park.

2.2 Design and Engineering

The Coopers Lateral Pipeline will be designed in accordance with the Australian pipeline standard AS2885:1997 - Gas and Liquid Petroleum. ANSI B31.3 will apply to piping specifications at the outlet flange of the hot-tap isolation valve, and the above ground section of piping on the inlet to the Meter Station. Key engineering and design features are outlined in Table 2-1.

Table 2-1: Engineering and Design Features

Feature	Details
Outside diameter	114.3mm
Wall thickness	4mm 4.8mm at crossings
Grade	API 5L X42
Design Factor	0.72

Feature	Details
Location Class	**T1- suburban**
MAOP	**9,930 kPag**
Operating Pressure	**Max 7,200 kPag**
Coating	**1mm High Density Polyethylene (HDPE) Concrete coated at crossings**
Cathodic Protection	**Sacrificial Anode**
Joint Coating	**Denso S40 Pipeline Wrap**
Depth of Cover	**1,200 mm**

2.3 Construction

Standard pipeline construction practices will be adopted for the Coopers Lateral Pipeline project. Generally construction activities will follow the sequence outlined in Table 2-2.

Table 2-2: Pipeline Construction Sequence

Construction Activity	Description
Detailed Survey	**Engineering, environmental and cultural heritage surveys are used both in routing and to determine if any special construction techniques or mitigation measures are required. Once the preferred pipeline route has been determined, then the centreline is surveyed and engineering aspects are finalised. Markers (pegs) are placed to identify pipeline route and the centreline of the ditch with offset pegs.**
Fencing	**Severed fences are replaced with temporary construction gates.**
Clear and Grade	**Graders and excavators are used to clear the right-of-way of vegetation and topsoil ready for construction to commence. Vegetation and topsoil is stockpiled separately on the right-of-way. Vegetation canopy will be hand trimmed with a chainsaw, as required. Topsoil will only be cleared from the passing lane on the working side, and stockpiled in the adjacent area.**
Trenching	**After the route is cleared, a trench (approx. 1.2 metres in depth) is dug for the pipeline either by a trenching machine or excavator. Trench spoil is stockpiled on the right-of-way, usually on the non-working side.**
Stringing	**Steel pipe is trucked to the construction site and sections, each approximately 18 metres long, are laid end-to-end next to the trench. The sections are placed on sandbags that are raised on blocks or wood (timber skids), to protect the pipe from corrosion and coating damage. Special pipeline sections on areas of reduced construction easement will be fabricated in extra work areas, and sections dragged onto the easement.**
Bending	**Where required, pipe sections are bent to match changes either in elevation or direction of the route.**
Welding and Joint Coating	**Pipe sections are welded together. The area around the weld is then sand blasted and coated, with the same protective coating as the rest of the pipe, to reduce corrosion.**
X-raying	**The pipes are inspected using x-ray equipment as per AS 2885.2-1995.**
Padding	**Where required, padding machines are used to sift the excavated subsoil to remove coarse materials. To protect the pipe coating the remaining fine material is used to pad beneath and on top of the buried pipe.**
Lowering-in	**Sidebooms (tractors with cranes) are used to lower the welded pipe into the trench.**

Construction Activity	Description
Backfilling	**Trench spoil is returned to the trench and material compacted to minimise risk of subsidence of material over the pipe.**
Pressure Testing	**Pipeline integrity is verified using hydrostatic testing in accordance with AS 1978. During hydrostatic testing the pipeline is capped with test manifolds, filled with water and pressurised up to 125% of operating pressure for a minimum of two hours. A 24-hour leak test then follows. Providing it meets water quality guidelines hydrotest water is discharged to the surrounding environment. If water fails to meet quality guidelines it will be treated prior to disposal eg. by chemical neutralisation. Hydrotest water is often treated with biocide, oxygen scavengers and corrosion inhibitors prior to testing, however it is unlikely that these chemicals will be used during testing of the Coopers Lateral due to its small size and subsequent short period of testing.**
Restoration and Rehabilitation	**Environmental specialists oversee restoration procedures. The easement is recontoured to match surrounding landform and erosion controls constructed where appropriate. Separately stockpiled topsoil is then respread evenly across the easement and any cleared vegetation placed across the easement, to assist in soil retention and provision of seed stock.**
Signage	**Information signs are erected along the easement as per AS 2885.1-1997.**

The construction working area (right-of-way) will be 25m and depending on the construction zone, partitioned as illustrated in Figures 2, 3 and 4. The pipeline route has been divided into zones to demonstrate the types of right-of-way variations. Zone 1 represents the construction working area within the constructed Barker Inlet Wetlands, refer Figure 2. Zone 2 represents the construction working areas adjacent to HEP drainage reserve, refer Figure 3. Zone 3 represents a typical restricted right-of-way construction zone. This zone is adjacent to Naweena road on the western side of drainage reserve (KP 3.11401 - 3.29991), refer Figure 4. Pipeline sections will be fabricated in extra work areas adjacent to Zone 3, at the corner of Naweena and Camira Roads, and sections dragged onto the easement.

Construction has been deferred at this time. Epic Energy will notify PIRSA of the proposed construction schedule upon project re-commencement. Construction is expected to be completed in approximately 4-6 weeks. The construction workforce is expected to consist of approximately 17 people, including the project management and pipe supply/distribution personnel.

2.3.1 Special Crossings

Road crossings will be carried out in accordance with local municipality requirements, the Pipeline Code of Practice and AS 2885.1-1997. The pipeline will most likely be installed beneath major sealed roads by directional drilling, and minor sealed and unsealed roads are likely to be crossed using traditional open cut methods. Approximate KPs for road crossings include:

- **Cormack Road KP 0.41507 - 0.4509**
- **Grand Junction Road KP 1.48448 - 1.59584**
- **Grand Junction Access Road KP 1.48448**
- **Gallipoli Grove KP 4.08632 - 4.11284**

It is proposed that traditional open cut methods will be used to cross the HEP drainage reserve (refer Figure 1) at the following KP points along the route: KP 0.28551, KP 3.04564 - 3.11401, KP 3.78153 - 3.83609, and KP 4.28751 - 4.3258.

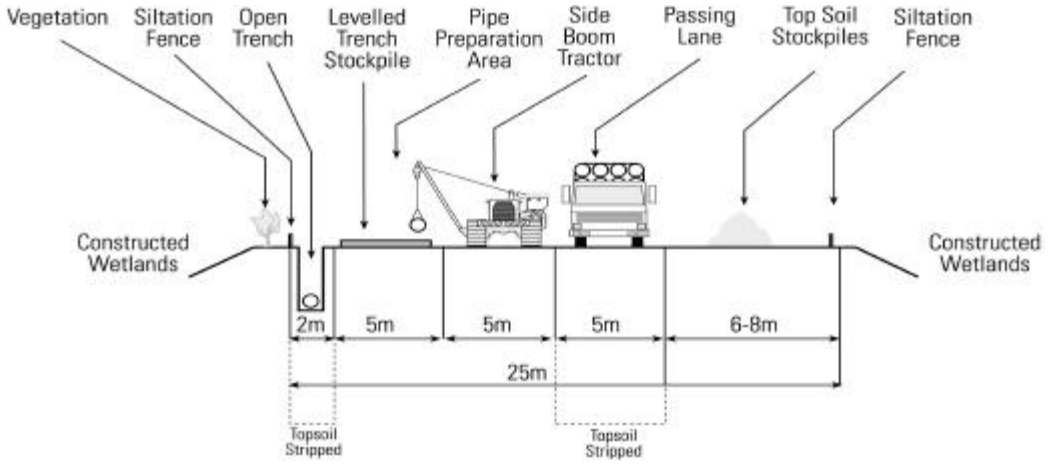


Figure 2: Zone 1 Construction Right-of-Way

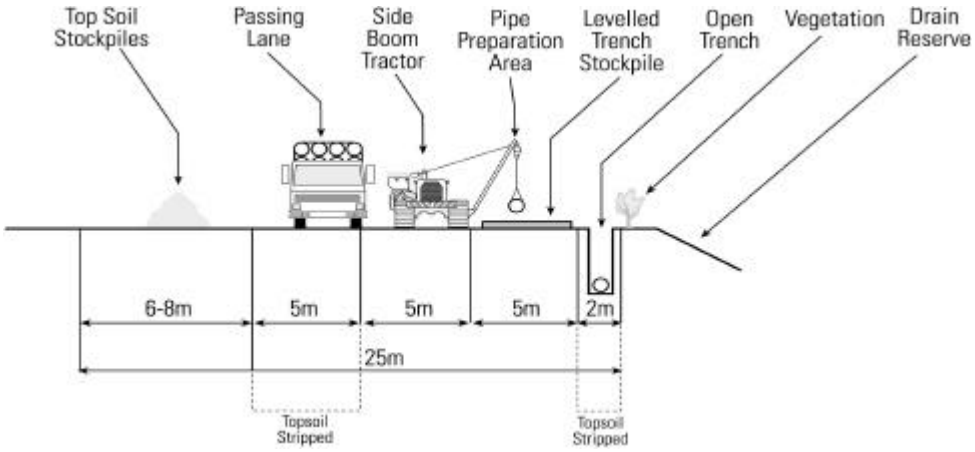


Figure 3: Zone 2 Construction Right-of-Way

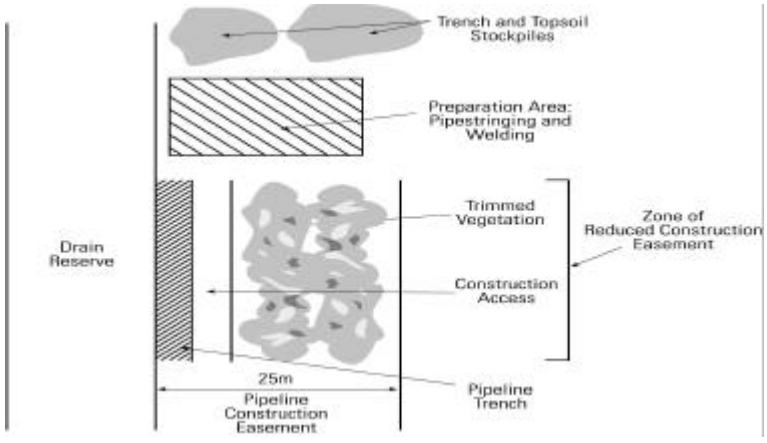


Figure 4: Zone 3 Typical Restricted Right-Of-Way Construction Area

2.4 Operation

A pipeline commissioning date has not been scheduled at this time. Gas delivery will be controlled remotely from Epic Energy's Gas Control Centre in Perth. Back up operating facilities are provided by staff at Epic Energy's Southern Depot at Dry Creek.

Day-to-day operations of natural gas transmission pipelines pose few environmental implications. Field operations undertake regular route inspections and maintain ongoing liaison with landholders as required. They will respond to maintenance requirements such as erosion control and weed control, as necessary.

2.5 Decommissioning

Epic Energy is committed to decommissioning the pipeline in accordance with the regulatory requirements and accepted current environmental best practice at the time of decommissioning.

Currently decommissioning procedures require the removal of all above ground infrastructure and the restoration of associated disturbed areas.

At the time of decommissioning a decision will be made regarding the opportunities for future use of the pipeline. If no longer required, the pipeline will be purged of gas and below ground facilities allowed to gradually degrade in-situ. If however, it is considered that the pipeline may offer some future benefits, it will be filled with an inert material and the cathodic protection system maintained to prevent corrosion. However, all above ground facilities will be removed.

3 Management of Environmental Issues

This chapter describes the existing environment along the proposed pipeline route, the potential impacts to the environment as a result of pipeline construction/operation, and proposed impact mitigation strategies. Identification of potential impacts and mitigation strategies are based on environmental issues (eg. soil, flora, heritage, etc.) rather than construction activity (eg. clearing, trenching, welding). More detailed management procedures for specific project tasks will be included in an Environmental Management Plan (EMP), which is part of Epic Energy's EMS commitments (See Section 1.5). Completed and approved JEA's will form designated hold and witness points in Epic Energy's inspection and test plans.

3.1 Climate

The project area lies in the northern Adelaide area. The Adelaide area has a well-defined Mediterranean temperate climate, with long warm dry summers and cool wet winters. Rainfall has a strong seasonal distribution (i.e. distinct winter rainfall) and a mean annual rainfall of 517.9mm at the Adelaide based Northfield Research Centre (www.bom.gov.au, 2001).

3.2 Soils and Terrain

3.2.1 Existing Environment

The project area is located within the Adelaide plains. Soils are characterised by pale red-brown sandy clay overlaid with sandy to clayey loam surfaces. Soils are slightly acidic to slightly alkaline at the surface, with an increase in pH with depth. Red-brown earths are more prone to water erosion associated with a decline in organic matter and structure due to cultivation.

The project area contains a large amount of landfill. Soil testing carried out by Egis Consulting (2001) found fill in all soil samples taken along the entire length of the route. Material ranges from dark brown sandy silty clays to gravelly sandy silts and fill depths ranging from 0.2 to 1.8m depth. Natural material beneath the fill generally consists of silty clay material with varying degrees of sand content (Egis, 2001).

Adelaide is situated upon an uplift coastal plain with Mount Lofty to the east. Late cainozoic block faulting influenced the development of drainage patterns and fault lines. The surrounding region comprises tertiary and quaternary basin sediments of the St Vincent Basin formed during block faulting along lines of weakness. The

Para-Fault runs through the project region, starting at Glenelg and continuing through North Adelaide and between Prospect and Kilburn. The region is underlain by the Pooraka Formation. The Pooraka formation was formed in the Quaternary, Pleistocene period (Department of Mines, 1980).

There are 54 registered groundwater bores within a 0.5km radius of the proposed pipeline route. The region is generally characterised by deep groundwater levels (Egis, 2001).

3.2.2 Potential Impacts

Construction of the pipeline may result in the following potential adverse effects to soils and terrain:

- **Possible erosion associated with earthworks (eg. erosion of stockpiled soil)**
- **Subsidence over the pipeline**
- **Changes in soil structure through mixing of topsoil and subsoil, and**
- **Contamination of soils by fuel, oils or chemicals (small quantities of fuel, oils and chemicals may be kept on-site for operation/maintenance of vehicles and equipment).**

The project is not expected to have any impact on confined groundwater aquifers.

3.2.3 Impact Mitigation

The above potential impacts can be mitigated through the application of appropriate strategies. These include:

- **Restriction of construction activities to the construction right-of-way**
- **Any areas of compacted soil as a result of the project will be ripped as part of reinstatement works**
- **The right-of-way and any associated access tracks impacted by the project will be reinstated promptly upon completion of construction works**
- **Hydrotest water will be tested before disposal to meet water quality guidelines**
- **Implementation of appropriate storage and handling procedures for fuels and chemicals (eg. labelling, bunding)**
- **Topsoil and subsoil to be stockpiled separately**
- **Trench spoil will be returned to the trench and compacted, and**
- **Construction activities will be monitored for excessive dust generation. Dust control measures (eg. use of water carts) will be implemented if excessive dust generation occurs.**

3.3 Soil Contamination

3.3.1 Existing Environment

In July / August 2001, as part of prefeasibility studies Epic Energy commissioned an environmental site assessment to determine the extent of possible contaminants in sub-surface soils along the proposed Coopers Lateral Pipeline route. The assessment was carried out by Egis Consulting. Results indicated that the site was suitable for recreational land use with respect to the relevant health-based investigation levels (HBIL) (NEPM, 1999).

One site was identified as potentially being contaminated by polycyclic aromatic hydrocarbons (PAHs). To determine the extent and level of PAH contamination, a contamination delineation assessment was carried out in November 2001. The aim of the delineation assessment was to determine the lateral and vertical extent of sub-surface soil contamination.

The contamination delineation assessment results indicated that the identified PAH contamination is limited in extent to the original bore, (associated with bitumen/asphalt used in fill material) and is unlikely to leach into surrounding soils.

3.3.2 Potential impacts

Contaminated soil disposal impacts and mitigation are addressed in the Coopers Lateral Pipeline Soil Disposal Plan (refer Appendix D). Potential impacts include:

- **Contaminated soil siltation or run-off into adjacent drainage reserve, and**
- **Short-term reduction in availability of access to drainage easement**

3.3.3 Mitigation Measures

Although leaching of contaminants into surrounding soil has been identified as unlikely, Epic Energy will remove the contaminated material and dispose of it to landfill. The disposal of contaminated soil will be carried out in accordance with the mitigation measures outlined in the Coopers Lateral Soil Disposal Plan, and include:

- **Soil will be disposed of in accordance with EPA** *Disposal Criteria for Contaminated Soil* **(1997)**
- **Waste will be transported by a licensed waste transporter to the appropriately licensed Wingfield Waste Management Centre**
- **An EPA** *Waste Tracking Form* **will be completed by the licensed waste transporter**
- **Clean fill will be used to backfill the trenched area on completion of soil disposal and/or pipeline laying**
- **Dust control measures (refer section 3.8.3) will be instigated, and**
- **All loads will be covered.**

3.4 Surface Water Resources

The project area contains the stormwater *Hindmarsh, Enfield, Prospect Drainage Authority* **(HEP) drainage reserve and begins in the southern portion of the constructed Barker Inlet Wetlands, north of Cormack Road.**

The proposed area is predominantly stormwater drainage reserve, including an open stormwater channel, under the HEP, which includes an area of Prospect (just north of the City of Adelaide) and areas of Devon Park, Dudley Park and Regency Park. This drainage reserve drains via the Naweena Road open earth channel north to the constructed Barker Inlet wetland (Torrens Catchment Water Management Board, 2001).

The Barker Inlet Wetlands are located near Wingfield 12km north of Adelaide CBD, and were constructed as a series of wetland ponds to improve the quality of water discharging into the Barker Inlet. The wetlands receive urban and industrial stormwater runoff from four stormwater systems covering approximately 4500hectares extending as far as North Adelaide (Port Adelaide Enfield Council, 2001).

The water quality of open sections of the drainage reserve was observed during field site inspections and water quality was generally poor, and the drain clogged with weeds and some illegal rubbish dumping. It should also be noted that the water quality in the wetland after any rainfall event is likely to be low, due to the urban/industrial nature of the catchment.

3.4.1 Potential Impacts

Construction of the pipeline right-of-way may result in the following potential impacts to surface water:

- **Contamination associated with minor fuel or chemical spills, or hydrotest water disposal**
- **Increased sediment load or turbidity due to soil erosion, surface run-off, drainage bank collapse or open cut crossings, and**
- **Disruption to local ecology.**

3.4.2 Mitigation Measures

The following mitigation measures shall be implemented to minimise impacts on the surface water present:

- **Soil will be stockpiled away from the drainage reserve or wetlands (refer Figure 2 and Figure 3)**
- **Vegetation clearance along surface water banks will be minimised to enable present vegetation to act as a natural siltation filter**
- **During periods of heavy inundation siltation fences will be erected along the drainage reserve as required**
- **Siltation fences will be erected adjacent to soil stockpiles within the Barker Inlet Wetlands (refer Figure 2)**
- **Appropriate reinstatement of the bed and banks of the stormwater drainage channel will be carried out within the shortest period practicable after any open-cut crossing works have been completed**

- **Refuelling will occur on away side of the right-of-way with respect to the drainage reserve**
- **Implementation of appropriate storage and handling procedures for fuels and chemicals (eg. labelling, bunding);**
- **Hydrotest water will be tested before disposal to meet ANZECC (2000) water quality guidelines, and**
- **Hydrotest water will be disposed off away from present surface waters (HEP reserve and wetlands) to land**

3.5 Flora and Fauna

3.5.1 Existing Environment

Assessment of the flora and fauna of the proposed alignment was undertaken on 17th December 2001 by Ecos Consulting. Vegetation and habitat along the length of the proposed alignment were inspected, assuming a right-of-way of 25m for pipeline installation.

Plant species recorded on or near the pipeline easement are listed in Appendix B.

Flora

Ground surfaces along the easement have been drastically altered by drainage and landfill operations since European settlement. Consequently, very little native vegetation remains. No plants of conservation significance were recorded during the survey.

The majority of the route is on landfill and contains no remnant vegetation. Weeds such as Barley-grass (*Critesion murinum***), Wild Turnip (***Rapistrum rugosum***) and Coastal Galenia (***Galenia pubescens***) dominate. A range of native trees and shrubs (particularly eucalypts and wattles) have been planted along some sections of the route, particularly adjacent to the drainage reserve and at the Sunnybrae Pony Club. Most of these species are not endemic to the area.**

The starting section of the route passes adjacent to the inlet and commencement of the constructed Barker Inlet Wetlands. These constructed stormwater treatment wetlands have been revegetated with a range of native species, including Common Reed (*Phragmites australis***) and Bulrushes (***Typha sp.***). Species such as Saltbush** *(Atriplex* **spp.), Swamp Paperbark (***Melaleuca halmaturorum***) and Sheoak (***Casuarina stricta***) have been planted on the landscaped wetland banks.**

The only remnant vegetation in the area is a samphire wetland west of the easement, opposite the Barker Inlet Wetlands. This patch contains a number of samphire species (including *Halosarcia* **sp. and** *Sarcocornia qinqueflora***), and is in moderate condition. Changes in drainage regimes and isolation from tidal influence have resulted in invasion of this area by alien species such as Barley-grass (***Critesion murinum***).**

The proposed alignment crosses Cormack Road (KP 0.41507-0.4509), Grand Junction Road (KP 1.48448-1.59584) and Gallipoli Grove (KP 4.08632-4.11284). The verges of these roads are heavily disturbed and are dominated by weed species.

Fauna

Fauna assessment was predominantly based on literature review, with additional ground-truthing conducted during the site inspection.

Fauna along the majority of the easement is likely to consist of low numbers of common and widespread species that are able to tolerate high levels of disturbance. These include Brown Snake, Blue-tongue Lizard, Australian Magpie, Australian Raven, Willy Wagtail and Magpie-lark. Common Froglets have been recorded in the drainage reserve. Horses are stabled at the Sunnybrae Pony Club.

Over 100 bird species are known to inhabit or visit the extensive Barker Inlet Wetland complex, including resident waterbirds and migratory species. Some resident waterbirds breed in the wetlands, in dense fringing vegetation and on small islands. During the site inspection, a number of relatively common bird species were observed in the small section of the wetlands adjacent to the easement. These included Black-tailed Native Hen, Dusky Moorhen, Eurasian Coot, Little Egret, Whiskered Tern, Grey Teal, Silver Gull, Australian Magpie and Willy Wagtail.

Although many migratory shorebird and wader species have been recorded in the Barker Inlet Wetlands, they do not represent significant habitat for these species. Unlike the coastal mudflats and salt-fields further north in Gulf St Vincent, which support thousands of shorebirds and waders, the wetlands do not contain extensive feeding areas capable of supporting large numbers of these species. Consequently, they tend to visit the wetlands in low numbers or as individuals, probably from the extensive habitats further north.

The wetlands are also likely to support frogs, fish, yabbies and other aquatic invertebrates. However, the section of wetland adjacent to the pipeline easement is likely to experience periods of low water quality, and may contain a less diverse aquatic fauna. Low water quality is expected because stormwater entering this section of the wetland through the HEP drainage reserve (which includes the wetland inlet) is derived from a heavily urbanised and industrialised catchment.

3.5.2 Potential Impacts

Flora

Clearing of the construction right-of-way and indirect damage to vegetation by vehicles and equipment will not impact upon remnant native species along the proposed alignment.

The overall impact of clearing the right-of-way is not considered significant as existing vegetation is highly disturbed with a high proportion of weed species and very few remnant species. The proposed alignment does not require clearing of any remnant trees or shrubs. A number of planted shrubs (mainly saltbush species) will be cleared at the hot-tap location in the Barker Inlet Wetlands.

Trench construction may indirectly impact planted trees adjacent to the proposed alignment, particularly along the drainage reserve. Planted tree canopy will be trimmed where necessary, and any further disturbance kept as minimal as possible.

Weeds are common and widespread along the proposed alignment. Although several of the weed species detected are proclaimed pest plants, none require destruction or specific control measures. There is presently no sign of disease. There is the potential for introduction or spread of weeds and/or disease associated with movement of vehicles and machinery.

Fauna

Potential impacts to fauna include:

- **Mortality due to entrapment in the open trench, and**
- **Short term disturbance associated with noise and human activity.**

Given the short time that the trench will remain open and the low abundance of animals in the area, impacts to fauna due to entrapment in the trench are not considered significant.

Noise associated with construction adjacent to the Barker Inlet Wetlands will cause some localised disturbance to birds using the southern tip of the wetlands. However, because the disturbance is short-term, and will only affect a very small proportion of the wetland complex, it is not considered to be significant. Birds are likely to move to other areas of the wetlands during construction, and resume their normal patterns of behaviour once construction ceases. Construction is unlikely to disturb breeding of resident wetland birds, as it will occur in mid-Autumn, outside their breeding period of August to December.

Some disturbance of horses at the Sunnybrae Pony Club is expected.

3.5.3 Mitigation Measures

Flora

The following mitigation measures shall be implemented to minimise impacts on vegetation:

- **Vegetation along the pipeline route shall be trimmed rather than cleared where practicable**
- **Vehicles and machinery shall be washed prior to entering the easement.**
- **Cleaning procedures shall ensure that machinery and vehicles are free of soil and vegetation before and after entering the project area, to prevent the spread of weeds and disease. Actions and procedures will be recorded in a vehicle washdown register**
- **Topsoil shall be stockpiled separately from subsoils and respread promptly after backfilling**
- **Cleared or trimmed vegetation shall be stockpiled separately and respread promptly after backfilling, and**
- **Replanting of any cleared shrubs adjacent to the Barker Inlet Wetlands shall be carried out, in consultation with Council.**

Fauna

Impacts to fauna shall be minimised through the following mitigation measures:

- **The period of time that the trench is left open shall be minimised**
- **Horse stock will be relocated, in consultation with the Sunnybrae Pony Club, to adjacent fenced paddocks until construction and backfilling in the area is completed, and**
- **Open trenches shall be checked daily during construction for trapped fauna.**

3.6 Cultural Heritage

3.6.1 Existing Environment

An assessment of Aboriginal and European cultural heritage values of the project area was undertaken by Vivienne Wood, a qualified archaeological consultant, on the 17th December 2001.

The entire project area, including both sides of the drainage reserve, wetlands and private access road reserves were surveyed. A combination of pedestrian and vehicular survey was undertaken. Representatives of the Kaurna Meyunna Inc. inspected the entire project area including, drainage reserve, wetlands and private access road reserves.

No Aboriginal archaeological sites or cultural material was found during the survey. This is likely to be a reflection of the nature of the landscape, with no obvious focus for Aboriginal occupation identified, and the current landuse in the area. The level of disturbance brought about through a long history of agricultural and industrial land-use, and addition of various levels of landfill are likely to have had a dramatic effect upon the preservation of any materials that might have been located along the proposed pipeline route (Wood, 2001).

In addition to consultation with relevant Aboriginal organisations the Register of Aboriginal Sites and Objects, held at Department of State Aboriginal Affairs (DOSAA), was consulted to ascertain whether there are any registered sites in the study area. No previously recorded and/or registered Aboriginal sites are registered in the vicinity of the proposed alignment (Wood, 2001).

No sites of non-indigenous cultural heritage value were identified along the proposed pipeline route during surveys. A search of the State Heritage Register was made to identify any non-indigenous sites or places within the general project area. Two sites were located in the general project region, over 500m from the route alignment. The Straining Shed of the Islington Sewage Farm (Database No. 11752), Pedder Crescent to the east of the study area, and the former Sunnybrae farm complex of the Islington Sewage farm (Database No. 10757), Tikalara Road to the west of the study area. Neither site will be impacted by the proposed pipeline (Wood, 2001).

3.6.2 Potential Impacts

Given that no Aboriginal archaeological sites were found during the survey, there is no foreseeable impact to known Aboriginal sites and therefore no archaeological

constraints on construction activities. Non-indigenous sites within the general project area will not be impacted by the proposed pipeline.

3.6.3 Mitigation Measures

All Aboriginal archaeological sites, objects and remains in South Australia are protected by provisions of the *Aboriginal Heritage Act 1988***, which makes it an offence to collect, damage or destroy such sites, objects or remains without the written authorisation of the Minister for State Aboriginal Affairs. In the event of cultural material being uncovered during the construction phase of the project, work shall cease and officers of the Department of State Aboriginal Affairs shall be contacted to determine what action should be taken. These procedures are outlined in Epic Energy's Cultural Management Plan.**

3.7 Noise

3.7.1 Existing Environment

Background noise levels along the pipeline route are dominated by industrial activities and traffic movement, particularly during the day. The project area is located between major heavy vehicle transport roads including South, Churchill, Grand Junction, Regency and Cormack Roads.

The immediate project area is not densely settled and is a light industrial area. The closest residences are located a significant distance away on the eastern side of Churchill Road, to the east of the proposed pipeline area.

3.7.2 Potential Impacts

Construction shall occur between 6.00am and 6.00pm.

Noise emissions during construction are likely to result from the operation of equipment such as excavators, graders, light vehicles, trucks and boring equipment. This will be in keeping with existing industrial activities. Any impacts to residential areas are unlikely, and any impacts will be limited and short term as a result of construction activities.

There is no noise associated with normal operation of the gas pipeline.

3.7.3 Impact Mitigation

Noise impacts shall be mitigated through the following measures:

- **Under normal operating conditions, construction will be scheduled between 6.00am and 6.00pm, where possible higher noise level operations will occur after 7.00am, and**
- **All vehicles and equipment shall conform to appropriate noise control standards.**

3.8 Air Quality

3.8.1 Existing Environment

Air quality in the project area is expected to be typical of an industrial area. The surrounding environment is predominantly light industrial and there are numerous emission sources in the project area. Vehicle emissions are considered to be a major source of pollutants, and the project area is located between major transport roads including South, Grand Junction, Churchill, Regency and Cormack Roads..

3.8.2 Potential Impacts

Minor emissions of pollutants such as nitrous oxides, sulphur oxides and carbon monoxide are associated with the exhausts of construction machinery and support vehicles. The potential impact of construction phase emissions is expected to be minimal due to the short term nature of the project. The air quality and Greenhouse gas impacts of these emissions will be insignificant.

Dust is likely to be the main hazard with regard to air quality. Dust may result from clearing and grading, excavation and trenching, movement of machinery and vehicles and grading of the right-of-way for restoration purposes. Dust generation is likely to be localised and restricted to the construction phase of the project. Construction is expected to take approximately 4-6 weeks, and planned for April 2002. Impacts are expected to be minor.

The planned release of gas from pipelines (including the flaring of purged gas) will be minimised for economic, environmental and greenhouse gas emission reasons. Pipeline venting is expected to occur in association with pipeline commissioning and may occur if required as part of maintenance activities during operations. The impacts on air quality and Greenhouse gas emissions will be insignificant.

3.8.3 Impact Mitigation

General management strategies for minimisation of potential impacts to air quality include:

- **Regular maintenance and servicing of machinery and vehicles, to limit the amount of emissions and potential leaks**
- **Minimisation of the period between clearing and restoration, to mitigate dust production**
- **Limiting of vehicle speeds, to mitigate dust production**
- **Watering of right-of-way sections, as required, to minimise dust production**
- **Where practical, planned gas releases (including the flaring of purged gas) shall be conducted under favourable meteorological conditions that will facilitate rapid atmospheric dispersion of the gas**
- **Adjacent landowners will be advised of any pending major venting operations prior to undertaking the activity, and**
- **Venting will be kept to the shortest practical time to minimise the amounts of Greenhouse gas released to the atmosphere.**

3.9 Land Use

3.9.1 Existing Environment

The dominant landuse within the project area is light industry. Previous landuse has included farming and commercial developments. Current industry ranges from scrap metal yards to manufacturers and the Islington Railway Workshops.

Land parcels are medium sized and as a result population density is moderate to low. No rural living or residential blocks are present along the easement

The pipeline traverses a section of the Sunnybrae Pony Club, which is currently used for horse agistment.

Three road reserves are crossed (ie. Cormack and Grand Junction Roads and, Gallipoli Grove). Third party infrastructure along the proposed easement includes ETSA power cables, Optus and Telstra communication cable, and SA Water pipeline.

There are no noted areas of conservation significance proclaimed under the *National Parks and Wildlife Act 1972* **within or surrounding the project area.**

3.9.2 Potential Impacts

The Coopers Lateral Pipeline project is small in scale and impacts to landuse are expected to be minor. Localised impacts can be summarised as:

- **Short-term reduction in availability of access to drainage easement**
- **Temporary replacement of any permanent fences with access gates**
- **Short term disturbance to horses (Sunnybrae Pony Club) associated with noise and human activity**
- **Injury to, or mortality of, horse in the open trench, and**
- **Temporary detours on unsealed roads (during open cut trenching).**

3.9.3 Impact Mitigation

Standard pipeline construction methods minimise the impact of construction on landuse by restricting construction activity to a defined right-of-way.

Appropriate mitigation measures include:

- **Disturbance to vegetation shall be restricted to the 25m right-of-way**
- **Access shall be restricted to that which is essential for pipeline construction and operation**
- **All vehicles shall carry fire extinguishers**
- **The exact location of underground infrastructure shall be determined before construction proceeds along the drainage easement**
- **The pipeline shall be buried to a minimum depth of 1200mm, thereby allowing revegetation following completion of pipeline construction**
- **All fences shall be reinstated following rehabilitation of the easement, and**
- **Horses at Sunnybrae Pony Club will be relocated to adjoining paddocks during construction.**

Measures used to mitigate impacts to fauna (Section 3.5.3) will also be effective in minimising construction impacts on horses.

3.10 Public Risk and Safety

3.10.1 Existing Environment

The project area contains a number of different zones. The Barker Inlet Wetlands are within the MOSS (Conservation) zone. The remaining drainage reserve zones include General Industry (1), Industry (Cast Metals), and Light Industry (1). Residences are located a significant distance from the project area, the closest being on the eastern side of Churchill Road. The main transport corridors in the immediate vicinity of the project area include Cormack, Grand Junction, Regency and Naweena Road.

3.10.2 Potential Impacts

The potential impacts to public safety are fire, explosion or radiation exposure as a result of pipeline rupture. The main potential causes of damage or pipeline failure are considered to be:

- **Corrosion of the pipeline (external or internal)**
- **Natural events which stress the pipeline (eg. earthquake)**
- **Excavation in easement by third parties**
- **Overpressure, and/or**
- **Metallurgical or construction faults.**

Injury to third parties is also a potential impact of construction activities. Hazards include construction work across roads, increased heavy vehicle traffic in the project area and dust generation. Hazards associated with dust are discussed in Section 3.6.

3.10.3 Mitigation Measures

Mitigation strategies include:

- **Installation of appropriate signage, in accordance with project traffic management plans, during construction and operation to clearly identify the presence of construction vehicles and the pipeline**
- **The design, installation and commissioning process shall be in accordance with relevant codes, in particular AS 2885.1-1997, and ANSI B31.3 where applicable**
- **Appropriate safety measures shall be undertaken where construction activities occur adjacent to or across roads**
- **The pipeline will be pressure tested prior to commissioning to ensure integrity of pipes and welds**
- **A comprehensive corrosion prevention program shall be implemented**
- **All welded joints shall be subject to x-ray inspection during construction to ensure integrity of welds**
- **Regular liaison shall be conducted with landholders and landusers to inform them of the schedule of construction works**

- **Monitoring of the pipeline from Epic Energy's Gas Control Centre in Perth and by locally based field inspectors, and**
- **Limiting of vehicle speeds to mitigate dust production.**

3.11 Additional Mitigation Strategies

3.11.1 Environmental Management Plan

A task-specific EMP shall be developed and implemented during construction of the proposed pipeline.

3.11.2 Awareness Program

Epic Energy shall ensure that all personnel are adequately aware of the relevant impact mitigation strategies.

3.11.3 Job Environmental Analysis

Epic Energy will subject construction activities to Job Environmental Analysis[1].

3.11.4 Contractual Obligations

All contracts with companies undertaking construction activities for Epic Energy on the Coopers Lateral Pipeline project shall include a requirement to:

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

3.11.5 Reporting

Any complaints from landowners or landusers that arise as a direct result of construction activities shall be recorded by the Lands Officer and reported to the Epic Energy Lands and Environmental Manager for initiation of appropriate response.

[1] **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.**

4 Consultation

During the preliminary survey, planning and design phases of the project Epic Energy initiated consultation with various stakeholders and interest groups that will be directly impacted by the construction and operation of the Coopers Lateral Pipeline. The following sections summarise consultation undertaken with State and Local Government, utility providers, private landholders and Aboriginal organisations.

4.1 State and Local Government

Epic Energy has consulted with representatives from the following State and Local Government Departments and Agencies:

- **Port Adelaide Enfield City Council**
- **Transport SA**
- **Environment Protection Agency, and**
- **Crown Lands SA**

In addition the following utility providers were also consulted:

- **ETSA**
- **Telstra;**
- **Optus, and**
- **SA Water.**

No issues of concern have been raised.

4.2 Private Landowners and Landusers

The proposed pipeline traverses 11 properties (Table 4-1). The greater proportion of land along the proposed pipeline easement is crown land. Negotiations and discussions with Crown Lands SA are ongoing. Other landholders include City of Port Adelaide Enfield Council, Australian Rail Corporation, Transport SA and National Rail Corporation. Landholders have been informed of the proposed pipeline project and negotiations for easement acquisition are ongoing.

The Sunnybrae Pony Club is located at the northern end of Gallipoli Grove, near the Coopers Brewery Site. The Sunnybrae Pony Club is located upon crown land under the custody of Port Adelaide Enfield Council. The Club was contacted at different project stages to coordinate land access, and provide information regarding the proposed Coopers Lateral Pipeline Project. Ongoing liaison regarding stock management, project details and access has been, and will continue to be, addressed during the project.

Epic Energy shall continue to work closely with landholders and landusers to ensure that they are well informed of the nature and schedule of construction activities.

Table 4-1: Properties traversed by the proposed Coopers Lateral Pipeline

Landowner	Title Reference
Crown	CR5620/151
City of Port Adelaide Enfield	CT5286/84
Australian Rail Corporation Ltd	CT5278/110
Crown	CR5663/226
Crown	CR5663/227
Crown	CR5442/173
Crown	CR5752/243
Commissioner of Highways	CT5443/284
Crown	CR5559/651
National Rail Corporation Ltd	CT5835/498
Crown	CR5753/971

4.3 Aboriginal Organisations

The study area lies within the boundary of the Kaurna Meyunna Inc organisation. Vincent Buckskin, the Acting Chairperson of this organisation, was contacted and he and Josie Warrior participated in the field survey of the proposed alignment and project area on the 17th December 2001.

Survey findings and proposed recommendations were discussed with the field group at the surveys completion. Copies of the heritage survey report were supplied for their information.

5 Conclusion

The Coopers Lateral Pipeline is a small project involving construction of infrastructure in a highly modified environment of low population density. The potential impacts to landholders, landusers, the environment and stakeholders are expected to be short-term and minor in extent. No significant long-term adverse impacts are expected. Nevertheless, the following key issues requiring attention during construction and operation of the proposed pipeline have been identified:

- **Protection of vegetation**
- **Appropriate disposal of identified contaminated soil**
- **Prevention of soil erosion**
- **Prevention of weed and disease spread, and**
- **Safeguarding of public safety.**

In managing potential impacts Epic Energy is committed to working closely with all relevant authorities, landholders and landusers. Compliance with the EMP shall be audited, and ongoing monitoring and maintenance programs shall be implemented. Epic Energy shall take all necessary steps to rehabilitate areas affected by the project during both construction and operation.

6 References

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Department of Mines (1980) Geological Survey Maps.

NEPM (1999) National Environment Protection (Assessment of Site Contamination) Measures. NEPC, Australia.

Torrens Catchment Water Management Board (2001) www.cwmb.sa.gov.au/torrens/extension

Port Adelaide Enfield Council (2001) www.portenf.sa.gov.au

Wood, V. (2001) Indigenous and Non-indigenous Cultural Heritage Survey: Coopers Lateral Pipeline. Unpublished Report to Ecos Consulting (Aust).

7 Abbreviations

Ecos	**Ecos Consulting (Aust) Pty Ltd**
EIR	**Environmental Impact Report prepared in accordance with Section 97 of the** *Petroleum Act 2000* **and Regulation 10.**
EMP	**Environmental Management Plan**
EMS	**Environmental Management System**
EPA	**Environment Protection Agency**
DEH	**Department for Environment and Heritage**
DOSSA	**Department of State Aboriginal Affairs**
ETSA	**Electricity Trust of South Australia**
HEP	**Hindmarsh, Enfield, Prospect Drainage Authority**
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 A

Environmental Policy

ENVIRONMENTAL POLICY

epicenergy

The environment is one of our most important values

Our company's success and standing in the community depends our commitment to the protection of the environment in which we work, and complying with relevant laws.

Our goal, whether it is in the performance of routine maintenance or construction of new facilities is to complete our work without environmental non-conformance.

The maintenance of the environment is the responsibility of each and every one of us. We will work to continually assess and improve our practices.

We will ensure free and open communication on environmental issues.

On behalf of all our stakeholders, I have committed Epic Energy to achieve and sustain environmental excellence using appropriate internal and/or external resources.

Epic Energy Operates in an Environmentally Friendly Manner

Sue Ortenstone

Chief Executive Officer
May 2001

Appendix B

Flora Species List

Table B 1: Plants Recorded Along the Proposed Coopers Lateral Pipeline

Botanical Name	Common Name	Location Present		Comment
		Barker Inlet	Drain Reserve	
Acacia paradoxa	**Kangaroo Thorn**	✓	✓	**P**
Acacia **spp.**	**Wattle**	✓	✓	**P**
Atriplex cinerea	**Grey Saltbush**	✓		**P**
Atriplex paludosa	**Marsh Saltbush**	✓		
**Avena barbata*	**Bearded Oat**	✓	✓	
**Bromus diandrus*	**Great Brome**	✓	✓	
**Callistemon viminalis*	**Scarlet Bottlebrush**		✓	**P**
Carpobrotus* **sp.	**Pigface**	✓		
**Casuarina stricta*	**Sheoak**	✓	✓	**P**
**Centaurea calcitrapa*	**Star Thistle**		✓	
Compositae* **sp.	**Daisy Family**	✓	✓	
**Convolvulus arvensis*	**Field Bindweed**		✓	
**Conyza bonariensis*	**Fleabane**		✓	
**Critesion marinum*	**Sea Barley**	✓	✓	
**Critesion murinum*	**Barley-Grass**	✓	✓	
**Cynara cardunculus*	**Artichoke Thistle**		✓	
**Cynodon dactylon*	**Couch**		✓	
**Cyperus eragrostis*	**Sedge**		✓	
**Dactylis glomerata*	**Cocksfoot**		✓	
**Digitaria sanguinalis*	**Crab Grass**		✓	
Disphyma crassifolium **ssp.** *clavellatum*	**Round-Leaf Pigface**	✓		**R**
**Echium plantagineum*	**Salvation Jane**		✓	
Enchylaena tomentosa **var.** *tomentosa*	**Ruby Saltbush**	✓		**P?**
Eucalyptus camaldulensis	**River Red Gum**		✓	**P**
Eucalyptus **spp.**			✓	**P**
**Foeniculum vulgare*	**Fennel**		✓	
Frankenia pauciflora **var.** *fruticulosa*	**Southern Sea-Heath**	✓		**R**
Fraxinus rotundifolia* **ssp. *rotundifolia*	**Desert Ash**		✓	
Galenia pubescens* **var. *pubescens*	**Coastal Galenia**	✓	✓	
**Galium aparine*	**Cleavers**		✓	
Halosarcia halocnemoides **ssp.** *halocnemoides*	**Grey Samphire**	✓		**R**
Halosarcia pergranulata	**Samphire**	✓		**R**

Botanical Name	Common Name	Location Present		Comment
		Barker Inlet	Drain Reserve	
Heliotropum europaeum4	**Potato Weed**		✓	
Isolepis nodosa	**Knobby Club-rush**	✓		**P**
Lavatera plebeia	**Australian Hollyhock**		✓	
**Lolium perenne*	**Perennial Ryegrass**	✓	✓	
**Lycium ferocissimum*	**African Boxthorn**		✓	
Maireana brevifolia	**Small-leaved Bluebush**	✓		**R**
**Malva parviflora*	**Small-flowered Marshmallow**		✓	
**Marrubium vulgare*	**Horehound**		✓	
Melia azedarach* **var. *australasica*	**White Cedar**		✓	
Melaleuca halmaturorum	**Swamp Paper-Bark**	✓		**P**
Melaleuca **sp.**		✓	✓	**P**
**Mesembryanthum nodiflorum*		✓	✓	
Myoporum **sp.**			✓	**P**
Nitraria billardierei	**Nitre-Bush**	✓		**R**
**Paspalum dilatatum*	**Paspalum**		✓	
**Pennisetum clandestinum*	**Kikuyu**		✓	
Phalaris* **sp.	**Canary Grass**		✓	
Phragmites australis	**Common Reed**	✓		**R?**
**Piptatherum miliaceum*	**Rice Millet**		✓	
Plantago* **sp.	**Plantain**		✓	
***Polygonum aviculare*	**Wireweed**	✓	✓	
Puccinellia stricta	**Australian Saltmarsh-grass**	✓		
Rapistrum rugosum* **ssp. *rugosum*	**Turnip Weed**		✓	
Rhagodia candolleana **ssp.** *candolleana*	**Seaberry Saltbush**	✓		
Rumex* **sp.	**Dock**	✓	✓	
Sarcocornia quinqueflora	**Beaded Samphire**	✓		**R**
**Schinus areira*	**Pepper-Tree**		✓	
Sclerostegia arbuscula	**Shrubby Samphire**	✓		**R**
Suaeda australis	**Austral Seablite**	✓		**R**
Typha domingensis	**Narrow-Leaf Bulrush**	✓	✓	**R?**
**Tamarix aphylla*	**Athel Pine**		✓	
**Urtica urens*	**Small Nettle**		✓	

***Denotes introduced species**
P = planted species
R= remnant species

Appendix C

Plates

Plate 1: Barker Inlet wetlands, facing Moomba-Adelaide hot tap location

Plate 2: Eastern side of drainage reserve, south of Cormack Road (KP 0.4509 -1.48448)

Plate 3: Eastern side drainage reserve, south of Grand Junction Road (KP 1.59584 - 3.04564)

Plate 4: Western side of drainage reserve, parallel to Naweena Road (KP 3.11401 -3.29991)

Plate 5: Western side drainage reserve south of Naweena Road, parallel to Industry (KP 3.31259 - 3.78153)

Plate 6: Sunnybrae Pony Club access road (KP 3.83609)

Appendix D

Coopers Lateral Pipeline

Soil Disposal Plan

Coopers Lateral Pipeline

Contaminated Soil Disposal Plan

Prepared for

Epic Energy SA Pty Ltd

by

Ecos Consulting (Aust) Pty Ltd

February 2002

Prepared for:

Epic Energy SA Pty Ltd
(ACN 068 599 815)
PO Box 698
26 High Street
DRY CREEK
South Australia 5094

Prepared by:

Ecos Consulting (Aust) Pty Ltd
ABN 57 081 918 194
26 Greenhill Road
WAYVILLE
South Australia 5034

ph: (08) 8357 0400
fax: (08) 8357 0411
ecos@ecos.com.au
www.ecos.com.au

Cover Image: Drainage reserve easement south of Cormack Road. Contaminated site approximately 500m south from Cormack Road

DOCUMENT CONTROL SHEET

Coopers Lateral Pipeline – Contaminated Soil Disposal Plan

ENV443

Document Reference	Revision Number	Revision Date	Compiled by	Checked by	Approved by	Comment
443-PL-SoilDispPlan-R-ab	**A**	**20-12-01**	**AB**	**SJS**	**SJS**	**Issued to Epic for review and comment**
443-PL-SoilDispPlan-R-ab	**B**	**14-01-02**	**AB**	**WEM**	**WEM**	**Reissued to Epic for comment and review**
443-PL-SoilDispPlan-R-ab	**C**	**15-01-02**	**AB**	**JG**	**JG**	**Approved by Epic Energy**
443-PL-SoilDispPlan-R-ab	**0**	**19-02-02**	**AB**	**SM**	**SM**	**Updated and reissued**

Table of Contents

List of Figures

1 Introduction

1.1 Coopers Lateral Pipeline Route

Epic Energy propose to construct and operate the Coopers Lateral Pipeline, which will link the Moomba-Adelaide Gas Pipeline, located north of Cormack Road Wingfield, to the Coopers Brewery (refer Figure 1). The pipeline will be approximately 4.5km in length and is being developed to supply natural gas for energy generation purposes at the Coopers Brewery.

From the Moomba Adelaide Pipeline the pipeline route proceeds south along an access track within the constructed Barker Inlet Wetlands and crosses to the east of the *Hindmarsh, Enfield, Prospect Drainage Authority* **(HEP) stormwater channel drainage reserve at the railway line. The route crosses under Cormack Road to the eastern side of the drainage reserve, and continues south. The pipeline route then crosses under Grand Junction Road. From Grand Junction Road the route will continue south and cross to the western side of the drainage reserve at the National Rail Corporation Freight Yard. The route continues south before crossing to the eastern aspect of the reserve and continuing through the Sunnybrae Pony Club access road reserve. The pipeline crosses to the west of Gallipoli Grove, continuing along the eastern side of drainage reserve before crossing to the western side and terminating at a meter station in the southeast corner of the Coopers Brewery, Regency Park.**

1.2 Environmental Site Assessment

Due to previous landuse and the extensive use of landfill within the project area, Epic Energy commissioned an environmental site assessment in July / August 2001 to determine the extent of contaminants in sub-surface soils along the proposed Coopers Lateral Pipeline route. With the exception of benzo(a)pyrene and total polycyclic aromatic hydrocarbons (PAH) in soil bore SB15, the chemical results indicated that the site was suitable for recreational land use with respect to the relevant health-based investigation levels (HBIL) (NEPM, 1999).

Soil bore 15 (SB15) is located along the eastern side of Port Adelaide Enfield Council drainage reserve, between Cormack and Grand Junction Road. The original site coordinates are 34° 50' 38.4612"S, 138° 34' 24.7620"E.

To determine the extent and level of PAH contamination around SB15 Epic Energy commissioned a contamination delineation assessment. Soil bores were taken at 10m intervals for a distance of 70m north and south of the site (refer Figure 2), between coordinates 34° 50' 40.8192"S, 138° 34' 24.9852"E and 34° 50' 36.0672"S, 138° 34' 24.6648"E. SB15 was redrilled for testing as SB62. Figure 1 indicates the location of the delineation area upon the proposed Coopers Lateral Pipeline route

A total of 15 soil bores were taken to assist in the determination of the lateral and vertical extent of sub-surface soil contamination. Samples were analysed by an accredited NATA laboratory, MGT Environmental Consulting.

Figure 1: Coopers Lateral Pipeline Route, Delineation Soil Bore Locations

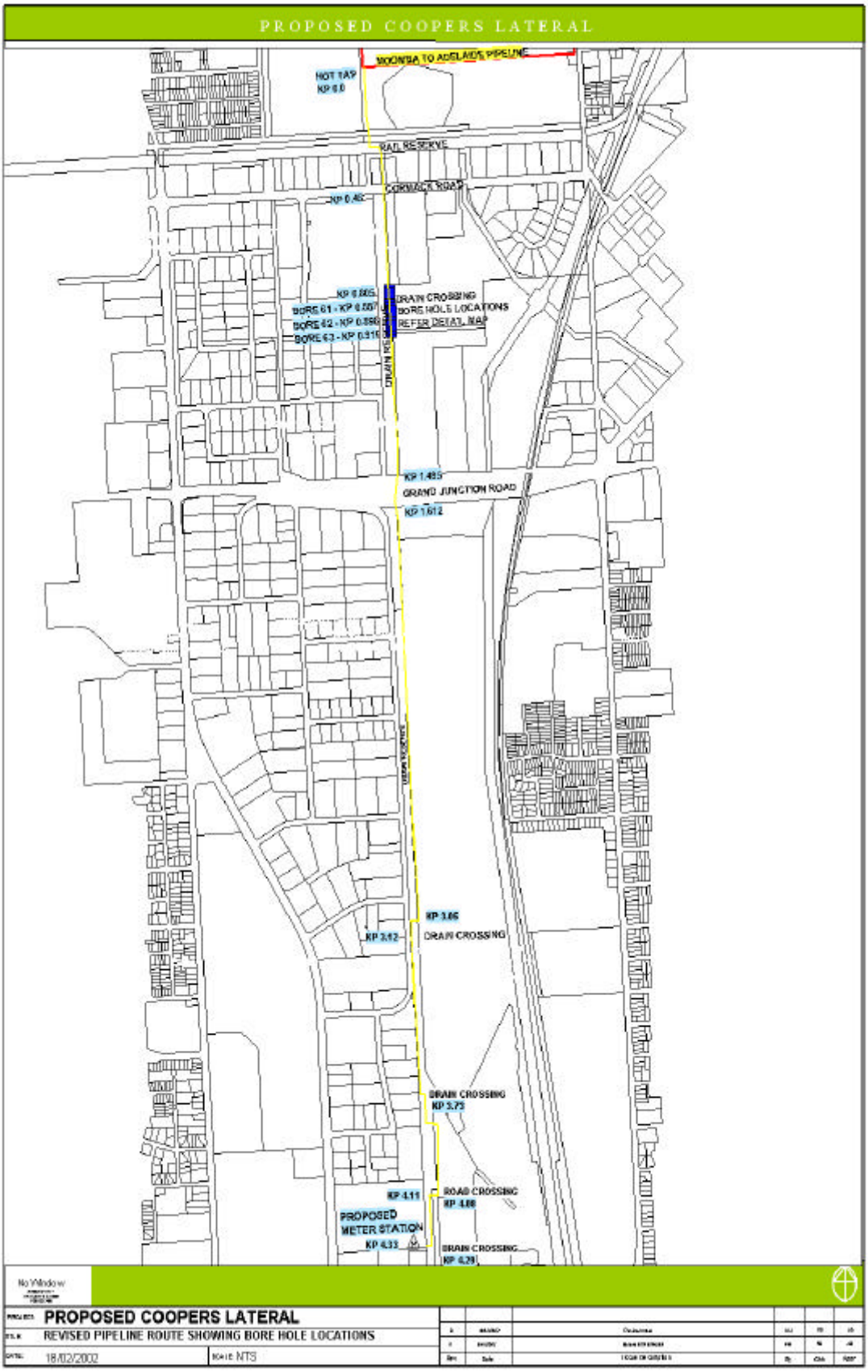
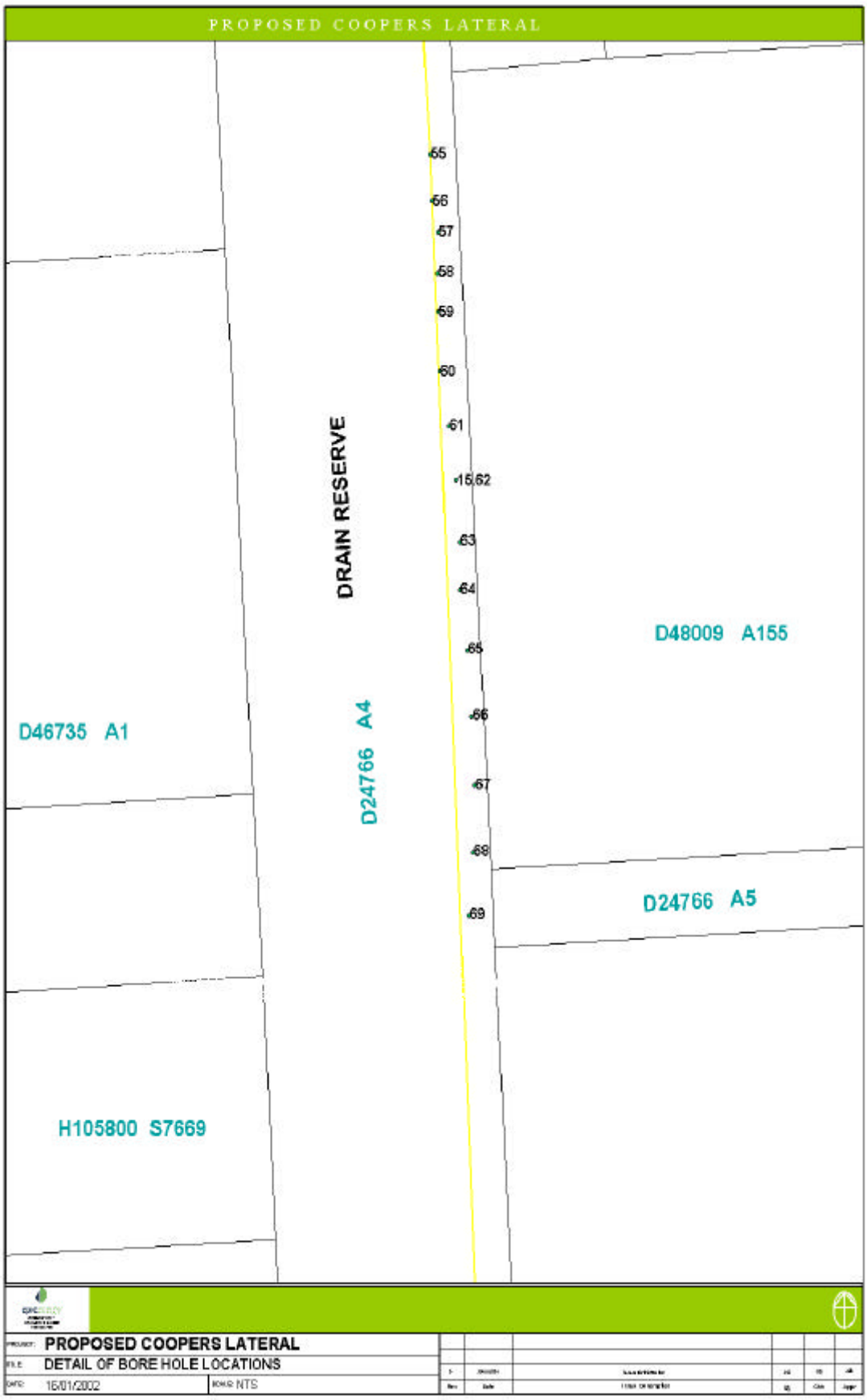


Figure 2: Delineation Assessment Soil Bore Locations



2 Contaminated Soil Results and Management

2.1 Delineation Results

2.1.1 Analytical Results

Analysis of soil samples indicated PAH concentrations were below the HBIL for recreational land use (NEPM, 1999).

Results of total PAH concentrations at Site SB15 (SB62) ranged from approximately 1.66mg/kg to 6.83mg/kg. Summary statistics for the disposal of these soils gives a 95% upper concentration level of 5.47mg/kg (total PAH) which is above the clean fill maximum values within the South Australian EPA disposal criteria for contaminated soils (EPA, 1997) and therefore is considered as intermediate landfill cover (Egis, 2001a).

2.1.2 Discussion of Results

The results of the contamination delineation assessment indicate that the PAH contamination identified in August 2001 is limited in extent. Soil samples recovered from both above and below the depth of originally identified contamination contained bitumen fragments. Analysis of the soil only from other samples indicated negligible leaching of PAHs from the bitumen into the soil. A similar result was found in samples SB63[2]/0.8-0.9 and SB61[3]/0.7-0.8, recovered 10m south and north of SB62 (redrilled SB15), respectively (Egis, 2001a).

The evidence of low leachability of PAHs from bitumen observed during this investigation suggests that the high PAH concentrations identified in sample SB15/0.85-1.0 in August 2001 were caused by the presence of bitumen fragments in the sample. Egis (2001a) considers the PAHs would be bound within the bitumen and would not leach significantly into the surrounding soil.

2.2 Contaminated Soil Disposal Outline

Epic Energy plan to excavate and dispose of contaminated trench in order to responsibly manage the present contamination and avoid future problems should the pipeline require any maintenance or further associated activities.

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[2] SB63 coordinates are 34° 50' 38.49"S, 138° 34' 24.9168"E

[3] SB61 coordinates are 34° 50' 37.7628"S, 138° 34' 24.8160"E

Testing of PAHs (including benzo(a)pyrene) has been completed for the disposal of approximately 19.5m^3 of soil from SB61 to SB63. Based on the results of this testing and summary statistics (95% UCL) for the disposal program, soil may be disposed of as intermediate landfill cover. Soil would be removed to reflect a depth of approximately 1300mm, width of 0.75m and a length of approximately 20m.

Intermediate landfill, according to EPA Guidelines (1997), can be deposited at an EPA licensed landfill. Requirements are outlined in Section 2.3. Further leachability testing will not be required, and results from this delineation assessment will be provided to landfill operators for verification.

2.3 Contaminated Soil Disposal Environmental Objectives

Contaminated soil disposal specific environmental objectives will include:

- **Avoid spread of contamination**
- **Minimise adverse impacts to air quality**
- **Minimise surface water run-off**
- **Appropriate transport and disposal of contaminated soil**
- **Appropriate backfill of the trench**
- **Minimise risks to public health and safety, and**
- **Minimise adverse impacts on fauna**

2.3.1 Mitigation Measures

The following mitigation measures will be applied to the disposal of contaminated soil from SB15 to SB61 and SB63 in addition to the environmental management measures outlined in the Coopers Lateral Pipeline Environmental Impact Report.

1. Avoid spread of contamination

Due to low leachability of bitumen into surrounding soil, it is unlikely soil will be contaminated except pieces of bitumen.

- **Cover stockpiles of contaminated landfill**
- **Place appropriate signage near any stockpiles of contaminated soil or areas, and**
- **Cover all potentially contaminated material during transportation**

2. Minimise adverse impacts to air quality

- **Use water for dust suppression as required**
- **Cover all truck loads of contaminated material, and**
- **Increase watering of exposed materials during windy weather**

3. Minimise surface water run-off

Due to low leachability of bitumen into surrounding soil, it is unlikely soil will be contaminated except pieces of bitumen.

- **Locate stockpiles of contaminated soil away from the open stormwater channel, and**
- **Use silt traps or barrier fences as required to prevent silt entering drainage reserve.**

4. Appropriate transport and disposal of contaminated soil

- **Contaminated soil will be transported by a licensed waste transporter**
- **Licensed waste transporter will complete an EPA** *Waste Tracking Form*
- **Contaminated soil will be disposed of to an EPA licensed waste disposal centre for intermediate landfill**
- **Licensed waste disposal centre information requirements will be provided, and**
- **Intermediate landfill cover will be taken to the Wingfield Waste Management Centre.**

5. Appropriate backfill of the contaminated soil trench

- **The trench will be backfilled with certified clean fill after soil disposal and pipeline laying**

6. Minimise risks to public health and safety

- **Prevent public access to the work site by use of temporary barriers**
- **Put up signs and barriers in any dangerous areas, and**
- **Put temporary barriers (e.g. bunting) around stockpiles of contaminated soil.**

7. Minimise adverse impacts on fauna

- **Minimise the amount of time the trench is left open, and**
- **Dispose of contaminated soil immediately.**

3 Bibliography

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NEPM (1999) *National Environment Protection (Assessment of Site Contamination) Measures.* **NEPC, Australia.**