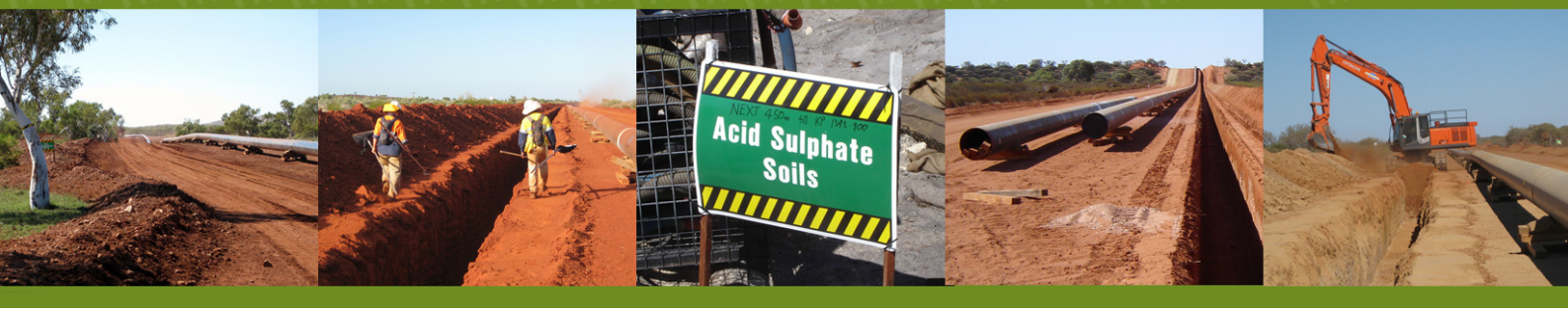

Wheatstone Ashburton West Pipeline

Construction Environmental Management Plan

DRAFT

Prepared for
DBP Services Co Group
by Strategen

Issue Date: <<Revision Date>>

STRATEGEN
environmental consultants

Wheatstone Ashburton West Pipeline

Construction Environmental Management Plan

DRAFT

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Limitations

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This report ("the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen Environmental Consulting Pty Ltd (Strategen). In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: DBP Services Co Group

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Preliminary Draft Report	Rev A	For transmittal to KT for costing purposes	H Ventriss	Electronic	17 May 2013
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Final Draft Report					
Final Report					

Wheatstone Ashburton West Pipeline

Construction Environmental Management Plan

DOCUMENT REVISION RECORD

Rev.	Date	Description of revision

Wheatstone Ashburton West Pipeline

Construction Environmental Management Plan

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All appendices are contained on CD-ROM inside back cover.

1. Background and environment factors

1.1 Introduction

DBP Services Co Group (DSC) proposes to construct a natural gas pipeline connecting the Dampier Bunbury Natural Gas Pipeline (DBNGP) to the Wheatstone project near Onslow, to allow Chevron to supply gas into the domestic market. The alignment is shown in two sections on Figure 1-1 as a black and white chequered alignment from Wheatstone to Tubridgi, and a blue alignment from Tubridgi to a location on the DBNGP immediately south of Compressor Station CS2.

DSC will be responsible for construction, ownership and operation of the pipeline.

Details of the construction activities are set out in Section 1.2. The proposed pipeline will comprise a 16-inch diameter pipeline to be constructed from the Wheatstone facility to Ashburton West (23.4 km) and a 14-inch diameter pipeline from Ashburton West at Tubridgi to the DBNGP (87.4 km). The 16-inch pipeline is referred to as the Wheatstone Lateral, and the 14-inch pipeline as Ashburton West Loop. The pipeline facility will have a total length of approximately 110 km. The pipeline will be constructed within a 30 m easement adjacent to a 20 m easement containing other gas pipelines. The Tubridgi to DBNGP section of the new pipeline will be used in conjunction with an existing 10-inch pipeline (the Ashburton West Lateral) in the adjacent easement. The three pipelines are collectively referred to in this plan as the Wheatstone Ashburton West Pipeline. However, the existing Ashburton West Lateral does not fall within the scope of this plan as it is not subject to any construction activities, other than tying in to the two new pipelines.

The 30 m easement is intended to accommodate up to three new pipelines and is widened at the locations of the two major watercourse crossings of the Ashburton River, as the pipelines need greater separation distances at such crossings for safety reasons.

During construction work, there will be a requirement to occasionally move out of the easement to meet practical working conditions, e.g. truck turnarounds, campsites, excess spoil storage, and materials and equipment storage. This additional space for the 'construction right-of-way' (CROW) will only be necessary during the construction period.

The project is planned to be undertaken during the 2014 dry season and will be implemented by DSC in accordance with DBP corporate environmental policy (Appendix 1).

Throughout this document, the name DBP will be used to refer to all of the DBNGP group companies and the DSC companies, with DBNGP used to refer to the pipeline system known as the Dampier to Bunbury Natural Gas Pipeline. This is because of the relationship that exists between the DBNGP Group Companies and the DSC companies in connection with the provision of services to the assets owned and operated by the DSC companies. To the extent that there is a change in any of the relationships or arrangements between the DBNGP Group companies and the DSC, the relevant DSC company, as the registered Licence holder, shall submit details of any such changes to DMP and, where appropriate, amend this plan.

1.1.1 Purpose and scope of this document

Pursuant to provisions of the *Petroleum Pipeline Act 1969*, DSC is required to submit a Construction Environmental Management Plan (CEMP) to DMP for approval prior to the commencement of construction. This document forms this CEMP and addresses management of potential environmental impacts that may be encountered during construction of the pipeline.

The plan covers the XXXXX and XXXXX, referred to collectively in this plan as the Wheatstone Ashburton West Pipeline.

1.1.2 Location

The pipeline alignment precedes from Wheatstone (about 10 km west-southwest of Onslow) in a southerly direction for approximately 7 km inside the government owned Multi User Infrastructure Corridor, then west for about 15 km to Ashburton West, and then in a south-southeasterly direction for 87.4 km to intersect the DBNGP immediately south of Compressor Station CS2 (see Figure 1-1). The alignment crosses the Ashburton river at two locations: between Wheatstone and Tubridgi immediately upstream of the causeway; and about 4 km from the intersection with the DBNGP.

The pipeline alignment is located entirely within the Carnarvon biogeographical region[1]. The region is described as having "*a low and gently undulating landscape with open drainage. Vegetation is mainly acacia shrublands and saltbush/bluebush shrublands, with areas of tussock grassland in the north. Major land tenure is pastoral leasehold, with some conservation reserves, such as the Cape Range National Park. The bioregion has a range of industries, including extensive cattle and sheep grazing, salt mining, tourism and fishing. Major population centres are Carnarvon, Denham, Exmouth and Coral Bay.*" (DEWHA 2008).

1.1.3 Land tenure

The pipeline will be constructed adjacent to a pipeline easement that contains a live 10-inch gas pipeline (Ashburton West Lateral) and a non-operational 6-inch pipeline between the DBNGP and the Ashburton West facility. The pipeline will be constructed within a easement that contains a liquefied petroleum gas pipeline between Tubridgi and Wheatstone. DSC has access to these easements, though Department of Regional Development and Lands (DRDL). At the time of writing this plan, DSC was seeking approval from DRDL to modify the easement boundaries to accommodate construction of the proposed pipeline, as the location of the existing pipelines within that easement limit the space available adjacent to those pipelines for safe construction access.

Construction activities may at times extend outside the approved easement (e.g. for vehicle turnarounds, turkey nest water storages and campsites), in which case access will be negotiated directly with the individual landowners. The tenure in these sections is Crown Leases for pastoral uses.

1.1.4 Justification

The pipeline is required to facilitate the supply of gas from Wheatstone into the domestic market through the DBNGP. Chevron has environmental approval for it to use an alternative alignment to the north (shown in red on Figure 1-1); however, DSC has negotiated arrangements with Chevron to provide and operate the facility, and has chosen an alternative route as a more effective and efficient option. Chevron will retain its approval for the alternative alignment.

1.1.5 Relevant environmental legislation and approvals

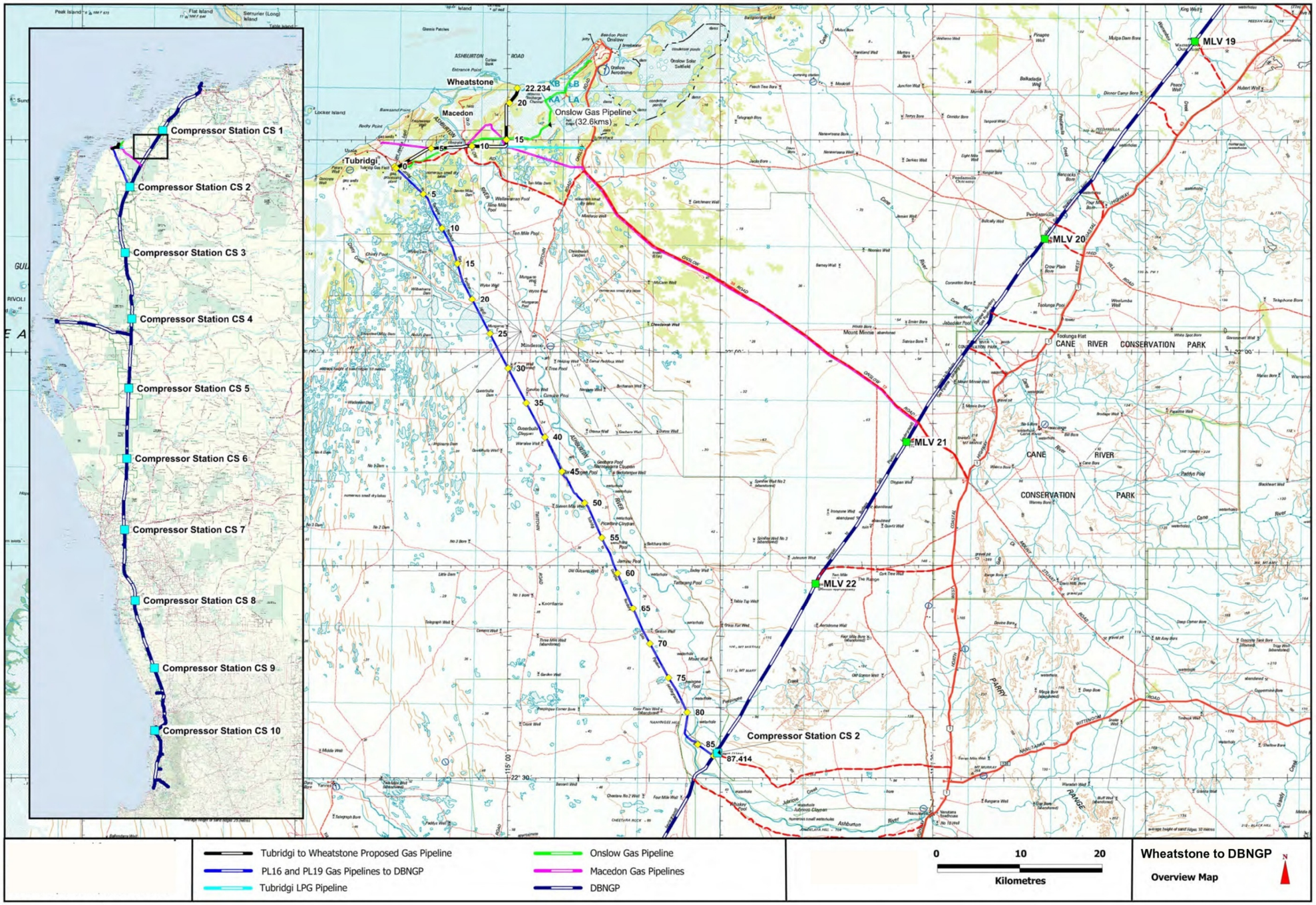
The following environmental legislation is relevant to the project:

- *Aboriginal Heritage Act 1972*
- *Agriculture and Related Resources Protection Act 1976*
- *Australian Heritage Commission Act 1975*
- *Environmental Protection Act 1986 (EP Act)*
- *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*
- *Land Administration Act 1997*

[1] Around 80 biogeographical regions were first delineated across Australia in 1993-94 as part of the Interim Biogeographic Regionalisation for Australia (IBRA). IBRA was developed under the coordination of Environment Australia by the States and Territories to identify appropriate regions to assess and plan for the protection of biological diversity. Biogeographical regions, or IBRA regions, represent a landscape based approach to classifying the land surface and were delineated based on many variables including regional and continental scale data on climate, geomorphology, landform, lithology and characteristic flora and fauna (Environment Australia 2000).

- *Land Administration Act 1997*
- *Petroleum Pipelines Act 1969*
- *Rights in Water and Irrigation Act 1914*
- *Soil and Land Conservation Act 1945.*
- *Wildlife Conservation Act 1950*
- Environmental Protection (Abrasive Blasting) Regulations 1998.
- Environmental Protection (Clearing Of Native Vegetation) Regulations 2004
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environmental Protection (Controlled Waste) Regulations 2004
- Environmental Protection (Noise) Regulations 1997
- Environmental Protection Regulations 1987
- Environmental Protection(Controlled Waste) Regulations 2004
- Petroleum Pipelines (Environment) Regulations 2012
- Rights in Water and Irrigation Regulations 2000.

Figure 1-1: Location of the pipeline alignment



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The management protocols provided in Section 4 of this CEMP and the associated management plans to be prepared by the contractors are to ensure compliance with the relevant legislation and associated approvals. Table 1-1 outlines the general legislative requirements relevant to the pipeline and the associated agencies responsible for the legislation.

Table 1-1: Relevant environmental requirement, legislation and agencies

Factor	Legislation	Agency	Requirement
Overall environmental acceptability	*Environmental Protection Act 1986*	EPA	Environmental impact assessment
	Environmental Protection and Biodiversity Conservation Act 1999	DSEWPaC and Minister#	Environmental impact assessment
Easement and additional land outside the easement	*Land Administration Act 1997*	DRDL	Approval under s 91
Construction	*Petroleum Pipelines Act 1969*	DMP	Pipeline Licence, Construction EMP Operation EMP
DRF/Priority flora	*Wildlife Conservation Act 1950*	DEC	Permit require to take if avoidance unavailable
Groundwater abstraction	*Rights in Water and Irrigation Act 1914*	DoW	Licence(s)
Heritage sites	*Aboriginal Heritage Act 1972*	DIA	Permit under s 18
Watercourse crossings	*Rights in Water and Irrigation Act 1914*	DoW	Permit

Minister#	Federal Minister for the Environment	DIA	Department of Indigenous Affairs
DEC	Department of Environment and Conservation	DMP	Department of Mines and Petroleum
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Cwlth)	DoW	Department of Water
		DRDL	Department of Regional Development and Lands
		EPA	Environmental Protection Authority

The processes associated with review, revisions and approval of revisions are set out in Section 6.2.

1.2 The project

A schematic of the Wheatstone Ashburton West Pipeline is presented in Figure 1-2.

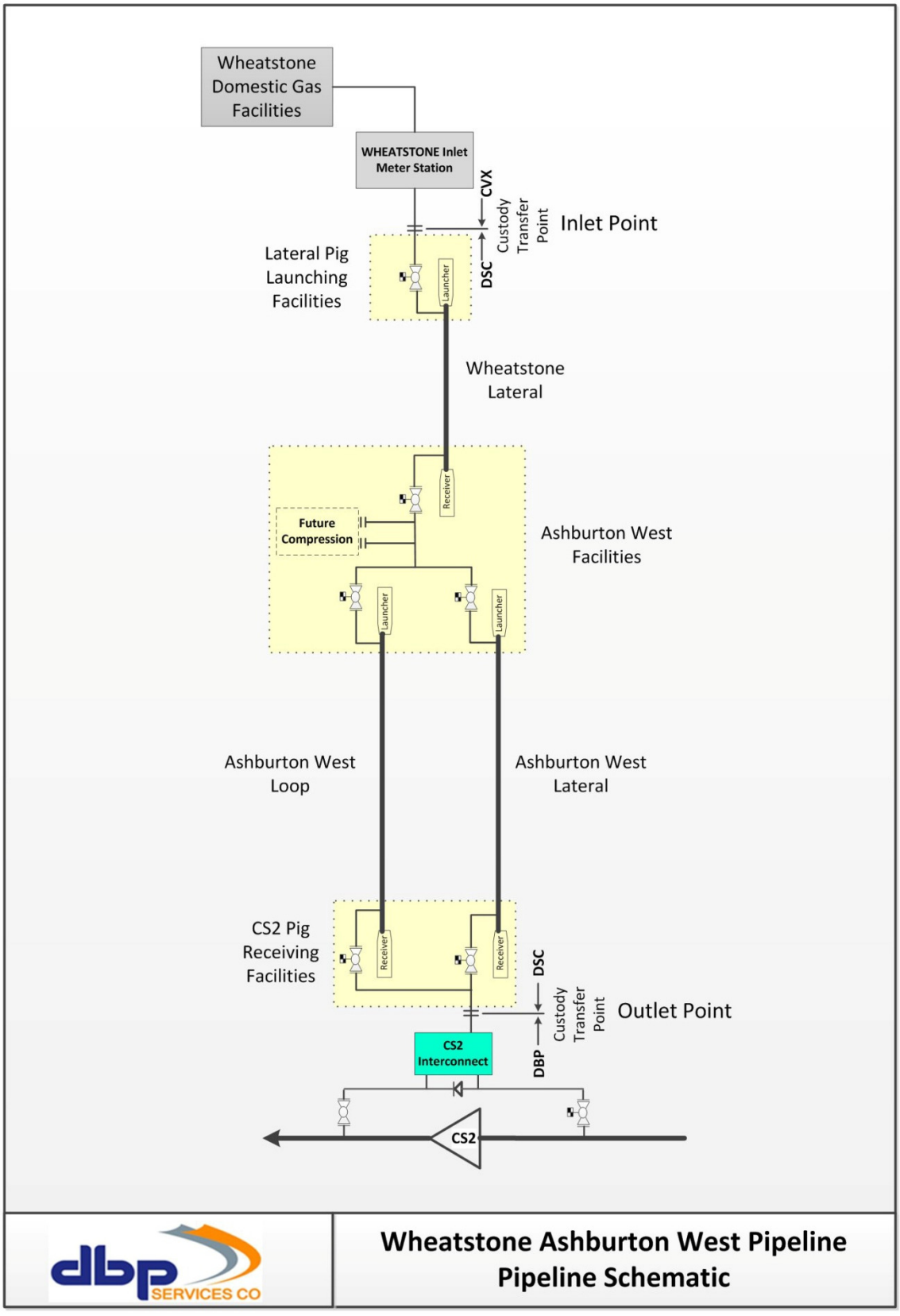
The project comprises a number of construction activities described in the following sections.

Terminology

The following terminology applies to land tenure and access arrangements along the pipeline:

1. **Easement** refers to the gazetted pipeline easement.
2. **Right-of-way** refers to the portion of the pipeline easement to which DSC holds access rights.
3. **Construction right-of-way** (CROW) refers to the portion of the Right-of-way designated for access for the construction of the project and may have width restrictions on it in certain areas in relation to environment, heritage and other aspects. It is normally contained within the Right-of-way, but may extend outside that for construction facilities such as turnarounds, spoil storage areas, turkey nest dams.

Figure 1-2: Wheatstone Ashburton West Pipeline Schematic

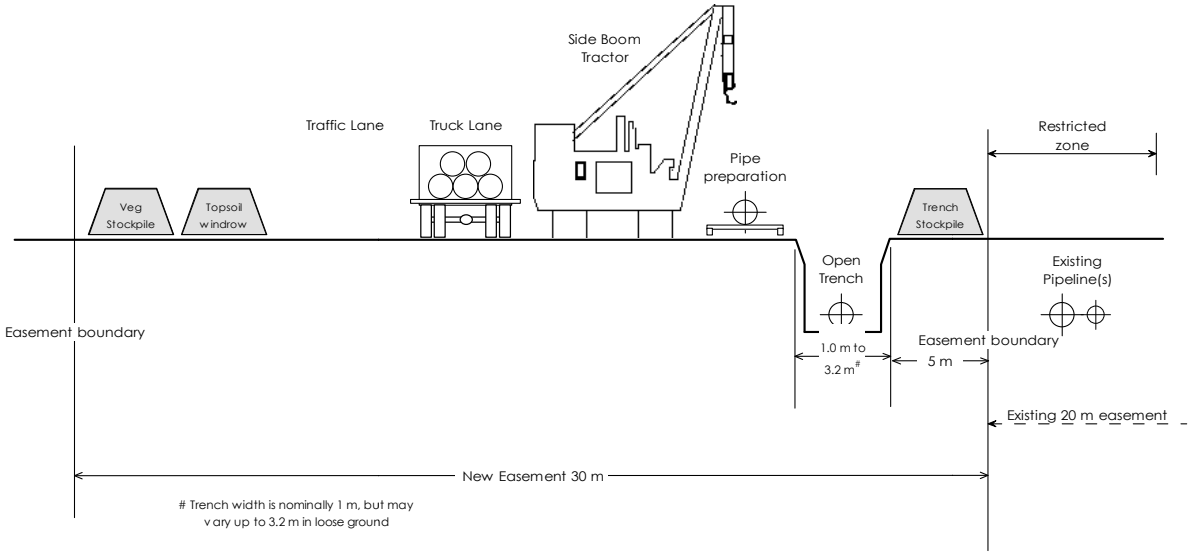


Pipeline construction

The construction right-of-way

Pipeline construction will typically be carried out within a 30 m wide CROW using a production line approach. An indicative cross-section of the CROW is shown in Figure 1-3.

Figure 1-3: Indicative cross-section of construction right-of-way (diagrammatic – not to scale)



Pipeline construction activities within easement

A number of specialised crews pass along the easement, fabricating and installing the pipeline then backfilling and rehabilitating the CROW. The pipeline will be constructed and operated in accordance with the requirements of *AS2885 Pipelines — Gas and Liquid Petroleum* and the Australian Pipeline Industry Association (APIA) *Code of Environmental Practice (1998)*. Typical construction activities expected for the pipeline are described in Table 1-2.

Table 1-2: Typical pipeline construction activities

Activity	Description
Detailed survey	Engineering, environmental and cultural heritage surveys are used both in route selection and to determine if any special construction techniques or mitigation measures are required. Once the preferred pipeline route has been determined, the centreline is surveyed and engineering aspects are finalised. Markers (pegs) are placed to identify the pipeline route and CROW.
Fencing	Fences are severed construction gates installed to allow access through for both property boundary and internal fences.
Clear and Grade	Graders and bulldozers are used to clear an area to provide for construction activities. This clearing will be within the CROW. The cleared area may include excavations through riverbanks and beds to establish a CROW. For safety reasons, dependent on soil type (eg heavy sand), an additional 3 m may need to be cleared in limited areas to allow for trench and stockpile stability. Topsoil will typically be graded to a depth of 100 to 150 mm for a blade-width over the trench line, or the entire working side or the full CROW, depending on factors such as the soil type, terrain, construction requirements and weather conditions. Topsoil will be stockpiled separately. Overburden related to dune and river crossings will be stockpiled adjacent to the excavation, in areas with no, or limited vegetation cover, where practicable.

Activity	Description
Trenching	After the route is cleared, a trench is dug for the pipeline by either a trenching machine or an excavator in accordance with pre-defined depths of burial. The required depths are determined by the AS2885.1 risk assessment process and recorded on construction alignment sheets. Trench spoil is stockpiled on the CROW, usually on the non-working side. Trench spoil is stockpiled separately to topsoil. The trench will be monitored daily for fauna entrapment and refuges (hessian bags or similar) placed in the trench to provide protection for fauna that temporarily occupy the trench. The trenches will be ramped at regular intervals to allow larger fauna to escape. The period that any part of a trench will be left open will be minimised. Trenches will be stopped and started at regular intervals with "plugs" between these sections to allow for unimpeded movement of livestock and fauna. Where possible, trenching will be delayed until completion of the welding and joint coating as part of ensuring that the trench will be open for the minimum amount of time.
Stringing	Steel pipe is trucked to the construction site and sections and laid end-to-end next to the trench. The sections are placed on sandbags and raised on blocks of wood (timber skids) to protect the pipe from corrosion and coating damage.
Bending	Where required, pipe sections are bent to match changes in either elevation or direction of the route.
Welding	Pipe sections are welded together.
Non-destructive weld testing	The pipe welds are inspected using x-ray or ultrasonic equipment as per AS 2885.2.
Joint coating	The area around the weld is grit blasted and then coated with a protective coating to prevent corrosion.
Padding	Where required, padding machines are used to sift the excavated subsoil to remove coarse materials to prevent damage to the pipe coating. The remaining fine material is used to pad beneath and on top of the buried pipe. In some instances (e.g. rocky soils), imported sand or foam pillows are used for padding.
Lowering-in	Side booms or excavators are used to lower the welded pipe into the trench.
Backfilling	Trench spoil is returned to the trench and material compacted to minimise the likelihood of subsidence of material over the pipe.
Watercourse crossings	The pipeline alignment contains two major watercourse crossings. Crossings will be constructed using standard open cut (trenching) or construction horizontal directional drilling, depending on the geotechnical issues at each site. Erosion and sediment control measures will be implemented to ensure there are no significant impacts at these crossings.
Pressure testing	Pipeline integrity is verified using hydrostatic testing in accordance with AS 2885.5. During hydrostatic testing the pipeline is capped with test manifolds, filled with water and pressurised up to a minimum of 125% of design maximum operating pressure for a minimum of two hours. A minimum 24-hour duration leak test then follows. Providing it meets Department of Water water quality guidelines and has landholder approval, hydro-test water is discharged to the surrounding environment. Hydro-test water will be sourced from a variety of sources, including public water supply system standpipes, dams, local groundwater or streamflows, subject to licensing from the Department of Water. In general, it is expected that no chemicals will be added as the pipeline is internally coated. However, in some locations chemicals may need to be added if there is danger of aggressive water affecting the integrity of the internal coating. In these cases and where necessary, the water will be treated to neutralise alkaline elements to an appropriate standard before discharge to the environment. This discharge is a once-off discharge during commissioning of the pipeline and will be undertaken to the requirements of the Department of Environment and Conservation.
Restoration and Rehabilitation	The CROW is re-contoured to match surrounding landform, and erosion controls constructed where necessary. Separately stockpiled topsoil is then respread evenly across the CROW and any stockpiled vegetation placed across the CROW, to assist in soil retention, provision of seed stock and fauna shelter. Reseeding or revegetation of the CROW, using appropriate species (i.e. crops/pasture or indigenous native species of the right provenance), will be undertaken to restore vegetation cover. An access track will remain as bare ground.
Signage	Information signs on the presence of the buried pipeline are erected in line of sight along the CROW as per AS 2885.1.

Watercourse crossings

Crossings of the Ashburton River will be completed by either open-cut excavation or by horizontal directional drilling (HDD). HDD under the riverbed will minimise disturbance, but its employment will be subject to ground conditions at each site being conducive to this methodology. Site-specific geotechnical conditions will determine the methodology to be used in each case.

At the sites where HDD is undertaken, an area will be required to temporarily house the drill rig. The drill site area for the HDD from an operational and safety perspective is usually 50 m x 50 m and incorporates an area for the positioning of the drilling rig, an area for the management of the drilling mud (i.e. mud pits) and a safe truck turnaround/manoeuvring area. The same topsoil removal and preservation methods used on the general construction right-of-way will be used when clearing the HDD pads.

HDD drilling mud disposal requirements include construction of evaporation dams at the HDD entry and exit locations where the mud will be stored until it is dry. At this point, the mud will then be loaded into tip trucks and disposed of at a suitable approved land fill/waste disposal site. The HDD pad will be rehabilitated.

Open-cut excavation will require excavation of the banks and riverbed, to achieve the required minimum depth for pipe location at 2 m below the stable riverbed.

Open-cut excavations will require excavation of the banks and riverbed, to achieve the pipeline to be laid at the required 2 m below the stable riverbed. This will ensure flow events do not expose the pipeline, ensuring pipeline integrity. There will also be the need to extend this excavation through the riverbank profile for some distance away from the river channel. This will result in the requirement for an increased working width across each bank of the river crossing to enable safe excavation of the trench and installation of the pipeline.

For the purposes of this document, the trench is the narrow excavation at the base of the working platform, whose sole purpose is to contain the pipeline. The trench does not include the major excavation below the natural surface to create a working platform in the watercourse area.

Crossing of the Ashburton River will be completed by open-cut excavation. Open-cut excavation will require excavation of the banks and riverbed, to achieve the required minimum depth for pipe location at 2 m below the stable riverbed.

Open-cut excavations will require excavation of the banks and riverbed, to achieve the required 2 m below the stable riverbed. This will ensure flow events do not expose the pipeline, ensuring pipeline integrity. There will also be the need to extend this excavation through the riverbank profile for some distance away from the river channel. This will result in the requirement for an increased working width across each bank of the river crossing to enable safe excavation of the trench and installation of the pipeline.

Borrow pits

Borrow pits to win suitable fine soils to place around the pipeline are unlikely to be required for the project. Should a borrow pit be required, the nearest existing pit will be considered where necessary. Should no existing borrow pit be suitable, the potential establishment of a suitable borrow pit will be discussed with the Department of Environment and Conservation (DEC) and relevant local authorities on a case-by-case basis.

Pressure testing

Pressure testing of the pipeline involves pumping water into the pipeline and maintaining a set pressure for a period (hydrotesting). Hydrotesting will require water to be sourced and following testing, appropriately disposed of.

Licences for taking of water will be obtained as required under the *Rights in Water and Irrigation Act 1914*.

After use, hydro-test water will be discharged into evaporation ponds, dams, turkey nests or areas of the easement in accordance with an approved protocol described in the Dewatering and Water Disposal Management Protocol (Section 4.4).

Other infrastructure requirements

Construction camps

A construction camp(s) may be erected along or near the pipeline. If required, the camp(s) will be constructed of demountable buildings with individual sleeping quarters, toilet/showers, laundry, food mess, wet mess (bar) and recreation rooms. The construction camp(s) will, where possible, be located to minimise noise impacts on surrounding residences, and in areas that have been largely cleared.

Typical waste products generated from the camp include:

- food scraps and general domestic waste
- recyclables, such as aluminium cans, bottles, steel, cooking oil
- wastewater – black and grey streams are generally combined.

1.2.1 Project inputs

Water supply

Up to approximately xx ML of water will be required for construction purposes, campsites and hydrotesting of the pipeline. Water will be reused where practicable, to minimise water requirements. Water will be required for potable uses (i.e. accommodation camps), dust suppression and hydrotesting. Drinking water will be provided as bottled water. All other water will be sourced from local groundwater along the construction route. The required licences will be sought from DoW prior to commencement of construction in any area.

1.2.2 Project outputs

Air (dust) emissions

Atmospheric dust will be the main component of air emissions during the construction phase of the pipeline, principally from clearing and grading, trenching, backfill and vehicle movement. Dust emissions are expected to be of short duration and intensity, and will be managed in accordance with a Dust Management Protocol (Section 4.9).

Noise and vibration

Pipeline construction activity will result in a temporary increase in noise and vibration levels within the immediate vicinity of the alignment. This impact is expected to be of short duration and intensity and will be managed in accordance with a Noise and Vibration Management Protocol (Section 4.10).

Liquid waste

Pipeline integrity is verified using hydrostatic testing in accordance with AS 2885.5. Providing it meets water quality guidelines and has landholder approval, hydro-test water is discharged to the surrounding environment. In general, it is expected that no chemicals will be added as the pipeline is internally coated. However, in some locations chemicals may need to be added if there is danger of the water affecting the integrity of the coating or the bare steel at the joints where the pipe lengths are welded together. In these cases and where necessary, the water will be treated to an appropriate standard before discharge to the environment. Disposal of this discharge, which is a once-off discharge during commissioning, will be managed in accordance with a Dewatering and Water Disposal Management Protocol (Section 4.4).

Trench and excavation dewatering may be required in locations of shallow groundwater, with disposal of this water not expected to have a detrimental effect on the receiving environment. Dewatering and water disposal will be managed in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).

Sewage will be generated at the campsite(s). Disposal will be undertaken by tanker removal and disposal to a licensed site, or treatment in a package wastewater treatment plant, and the treated effluent disposed of via infiltration ponds in locations that will not cause pollution of the receiving environment. Disposal will be managed in accordance with the Waste Management Protocol (Section 4.12).

Solid waste

Small amounts of domestic and industrial solid waste will be generated during construction and operation of the pipeline. The waste will be disposed of in accordance with the Waste Management Protocol (Section 4.12), which will be consistent with relevant local authority requirements.

1.3 Environmental factors

1.3.1 Key factors

The key environmental issues associated with the proposal are:

- flora and vegetation (including weeds)
- fauna
- acid sulphate soils
- watercourse crossings.

The assessment of potential impacts and their management related to these issues is discussed in the environmental impact assessment prepared for referral to the EPA (Strategen 2013), a copy of which is presented in Appendix 2). Other environmental factors not considered key to be relevant factors but requiring further consideration were also identified.

The following studies have been undertaken to investigate key environmental factors and are contained in full in the appendices:

Terrestrial vegetation and flora studies to assess potential impacts on the conservation status of those species known or likely to occur along the pipeline easement (Mattiske 2013—see Appendix 2). No Declared Threatened Flora species were recorded within the survey area. Two Priority 3 Flora species (*Eremophila forrestii* subsp. *viridis* and *Grevillea ? subterlineata*) were recorded within the survey area. No Threatened or Priority Ecological Communities were inferred to occur within the survey area.

Terrestrial fauna studies to assess the potential impacts on the conservation status of those species known or likely to occur along the pipeline easement (Ninox 2013—see Appendix 2). The survey recorded no species of conservation significance that would be expected to be affected by the pipeline construction. Three birds of conservation significance were recorded, but would not be expected to be exposed to potential impacts from the construction activities.

Acid sulphate soil studies to determine the occurrence of acid sulphate soils, and required treatment rates will be undertaken in accordance with the Acid Sulphate Soil Management Protocol prior to commencing any excavations (Section 4.5). Investigations for the Wheatstone Development indicated the potential presence of acid sulphate soils in the coastal locations of the alignment, with risk ratings of medium to high.

2. Environmental Management

2.1 Introduction

This chapter describes the project environmental impact mitigation measures that will be implemented by DSC. It will also describe the mechanisms/tools that will be employed to implement those measures. All impact mitigation measures that will apply to the project will be consistent with the Australian Pipeline Industry Association (APIA) impact mitigation measures as outlined in the APIA *Code of Environmental Practice*.

2.2 Management framework

2.2.1 Environmental management system

DSC operates in accordance with its Environmental Management System that includes the Health, Safety and Environment Policy, the Construction Environmental Management Plan, Operational Environmental Management Plan, and other subsidiary environmental documentation. . The purpose of the Environmental Management Plan is to ensure proactive planning, sustainable development and continuous environmental improvement.

The key elements of the DSC Environmental Management System include:

- a corporate environmental policy (Appendix 1)
- assessing environmental risk and identification of legal requirements
- developing objectives and targets for improvement
- training, operational control, communication, emergency response, corrective and preventative actions
- audits and review.

2.2.2 Environmental policy

DSC is committed to responsible environmental management of the project and believes that all potential adverse environmental effects can be effectively managed. All planning, construction and operation activities shall be conducted in accordance with the DBP Environmental Policy (Appendix 1), which outlines the DBP commitment to sound management of environmental aspects of the project.

2.2.3 Project management plans

Construction Environmental Management Plan (CEMP)

Under the *Petroleum Pipeline Act 1969*, DSC is required to submit a CEMP to DMP for approval prior to the commencement of construction. This document forms this CEMP and aims to address potential environmental impacts that may be encountered during construction of the pipeline.

Environmental Line List

All site-specific environmental information will be captured in an Environmental Line List (ELL). This list will be sorted by chainage (KPs) and will include the location, issue and management practices (e.g. protocols to be implemented) required for site-specific environmental issues. Results of the specialist surveys and consultation will be captured here. The ELL will be consolidated with other critical construction information in a Construction Line List, which will be issued to all crews. A preliminary ELL is presented in Appendix 4.

2.2.4 Environmental management actions/protocols

The environmental management actions and protocols prescribed in this CEMP aim to meet the Management Commitments and achieve the objectives outlined in Section 2.5. The protocols are intended to provide clear and practical guidance to the planning, construction and operation workforce. As such, the protocols are structured according to the activity (or task) for each phase of the project, which reference specific management actions to address key issues (or protect significant environmental locations).

2.2.5 Job environmental analysis

A Job Environmental Safety Hazard Analysis (JESHA) is to be completed by the construction supervisor and submitted to the Project Manager prior to commencement of each construction activity (eg. clear and grade, trenching etc.). This form shall identify the specific environmental objectives and hazards associated with the particular type of construction activity, and shall receive approval from DSC prior to commencement of the outlined activities.

2.2.6 DBP Services Co Group

The DSC operates and maintains assets connected to the DBNGP and in some cases owns those assets. This business is aimed at leveraging the DSC core competency of owning and operating gas transmission infrastructure. Ownership of DSC and corporate structure of this group are illustrated in Figure 2-1.

DSC relies on the services of DBNGP (WA) Nominees Pty Ltd (Nominees), the owner of the DBNGP, for the provision of labour and equipment to enable DSC to undertake its business. The services are provided under a support services agreement between the DBNGP group of companies.

The ownership structure of the combined DBP Groups (including the DBNGP Group and the DSC) is outlined in Figure 2-2.

Figure 2-1: Reporting structure (DSC/DBP)

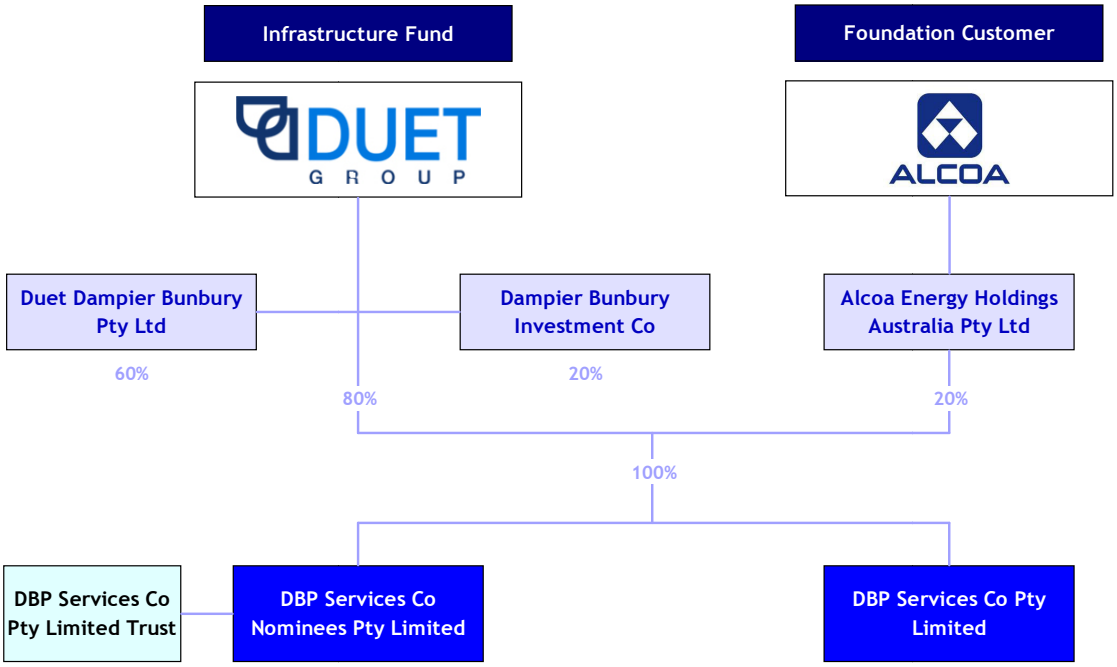
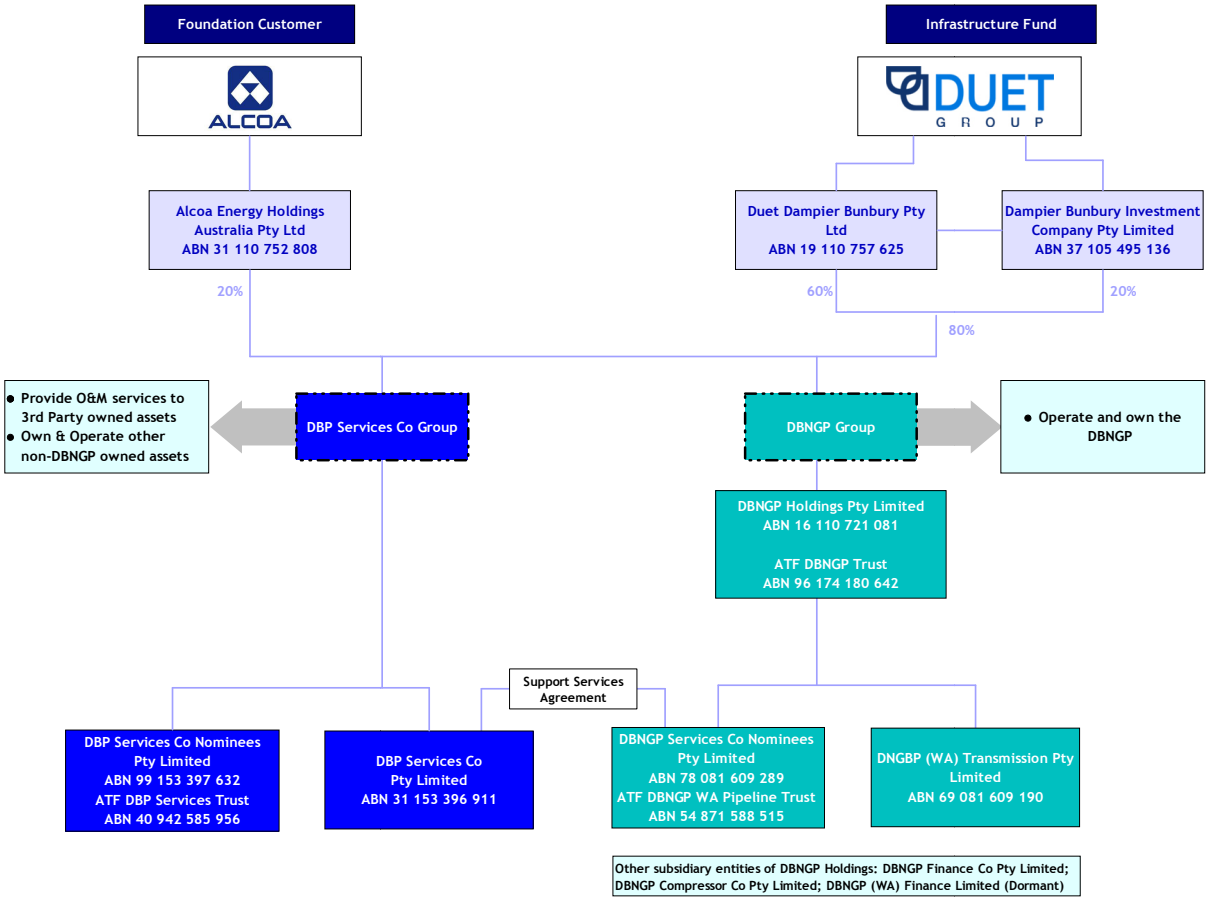


Figure 2-2: Corporate Structure (Combined DBP Groups)



The DBP Group is backed by investors with both a strong financial standing and a focus on ensuring operational reliability. The ultimate beneficial owners of the DBP Group being

- DUET – 80% owner
- Alcoa of Australia – 20% owner.

DUET is an ASX listed infrastructure fund jointly managed by Macquarie and AMP Capital Investors. Alcoa World Alumina Australia is the trading name of the unlisted public company Alcoa of Australia Limited. Alcoa of Australia Limited is 60% owned by Alcoa Inc., which operates one of the largest integrated bauxite mining, alumina refining and aluminium smelting systems in the world and is a global leader in alumina production. Alumina Limited owns the remaining 40% and is listed on the ASX (ASX:AWC).

2.2.7 Responsibilities

Environmental management and compliance with the management actions and protocols outlined below will be the responsibility of all personnel and a contractual obligation for all contractors involved with the Project, as set out in Table 2-1.

Table 2-1: Responsibilities

Position	Responsibilities
DSC	
Project Manager	Directly responsible for the management of the Project, including all environmental aspects. Reports directly to the DSC Executive Management.
Construction Manager/Supervisor	Directly responsible for overseeing and fulfilling commitments contained in this CEMP. Reports to the Project Manager regarding the project environmental performance and due diligence.

Position	Responsibilities
Environmental and Land Manager	Responsible for overseeing, supporting and advising the Construction Manager on environmental, cultural heritage and land matters. Environmental Manager (external specialist contractor) to liaise with Construction Contractor Environmental Manager on implementation of CEMP. Coordinates DSC audit programs.
Construction Contractor	
Environmental Manager	Responsible for ensuring that works comply with the CEMP, meet regulatory requirements, and that all environmental objectives contained in the contracts are attained. Provides advice to the construction workforce regarding implementation of the CEMP. Co-ordinates external heritage monitors, through specialist external heritage contractor, to be onsite in nominated areas during construction.
Superintendent and Inspectors	Field based personnel responsible for ensuring construction complies with the project's objectives and the CEMP.
External	
Environmental Auditors	External to DSC and contracted to conduct periodic audits according to the principles of this CEMP and relevant environment legislative compliance. The Auditors are coordinated by the Environment Manager but report to the Project Manager.
Heritage Advisers	Specialist external contractors used in the field to provide advice on specific heritage matters on an as-needs basis. Co-ordinated by the DSC Approvals Manager.
Heritage Monitors	Aboriginal community representative engaged to assist with cultural heritage site management in nominated areas during construction. Co-ordinated by the Construction Manager/Construction Environmental Manager through specialist external heritage contractor.

2.2.8 Inductions and training

Construction personnel shall be required to attend a project induction program prior to commencing work on site. The induction program will include a major environmental component designed to ensure that all personnel are aware of their environmental responsibilities.

The construction environmental induction component shall cover general environmental management issues, including:

- relevant legislation and legislative requirements
- roles and responsibilities
- environmental issues for the project, including:
- management of sensitive areas
- erosion and sediment control
- protection of water quality
- spill management and response
- vegetation and habitat management
- interaction with fauna
- weed control
- cultural awareness and heritage management
- protecting existing utilities, infrastructure and the amenity of landholders
- traffic and access
- waste management
- fire management
- emergency response
- project documentation (including the CEMP, Construction Alignment Sheets, Environmental Line List, technical drawings and other associated documents)

- incident reporting.

In addition, job specific training shall be conducted prior to the commencement of the following activities:

- clearing and grading
- trenching
- lowering in and backfill
- clean up and rehabilitation
- testing and commissioning
- drilling/boring.

It is the responsibility of the construction contractor to prepare and implement an environmental induction and job specific training program approved by DSC.

2.2.9 Public complaint response

All complaints from the public regarding construction activities and that relate to environmental factors shall be treated as Environmental Incidents and managed consistent with the Environmental Incident Response Protocol outlined in Section 4.1. Complaints shall be referred to the Environmental Manager or Construction Contractor for investigation as appropriate to the subject of the complaint. Incident forms will be used for recording and detailing investigations and management responses as for all environmental incidents.

2.3 Assessment of environmental effects and risk

2.3.1 Methodology

DSC is committed to continual improvement in performance, efficient use of natural resources and aspires to zero harm to the environment. A risk-based approach is applied in the management of construction and operations; the overall philosophy is to give priority to designing the pipeline and work activities in such a manner as to avoid the creation of hazards that may lead to the potential for environmental impact. Where this is not possible, the priority will be to minimise and mitigate potential environmental impact through design and/or the implementation of specific constructional processes and procedures. Where environmental hazards are inevitable, they are to be managed to ensure that the potential for environmental harm is reduced to “As Low As Reasonably Practicable” (ALARP).

Potential environmental impacts have been assessed to determine their consequence. Refer to Appendix 3 for a copy of the DBP Risk Model. The Risk Model combines the consequence and likelihood to determine the risk ranking which in turn assigned the correct level of management required to successfully reduce the environmental risk to ALARP.

2.4 Environmental risk register

An environmental risk register has been developed for the project. The following environmental factors were examined in developing the environmental risk register:

- vegetation and flora
- fauna
- soils and terrain
- groundwater
- watercourses
- noise and vibration
- air quality (dust)
- waste management

- heritage
- land usage and services
- public safety and risk.

The majority of potential impacts identified are considered to be of low risk and can be managed through standard operating procedures. Five aspects were considered be of moderate or high risk and these will require senior management attention. These aspects related to:

- trenching and excavation
- drilling/boring
- stringing and welding
- crossing watercourses
- clean up and rehabilitation.

The project will conduct construction risk assessments prior to implementation to ensure that all risks are appropriately identified, mitigation plans developed, and recording and auditing systems initiated.

Table 2-2: Environmental risk register

Activity	Potential environmental impact	Mitigation Measures	Consequence	Likelihood	Risk Level
Pre planning	Disturbance to infrastructure, nearby residents and land use activities Increase public risk from siting of pipeline	Dust Management Protocol (Section 4.9) Noise and Vibration Management Protocol (Section 4.10) Rehabilitation Protocol (Section 4.15)	Minor	Remote	Negligible
Refuelling and servicing	Contamination of local environment	Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11)	Minor	Remote	Negligible
Chemical storage and handling	Contamination of local environment	Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11)	Minor	Remote	Negligible
Waste management	Contamination of local environment	Waste Management Protocol (Section 4.12)	Minor	Remote	Negligible
Clear and Grade	Impacts on vegetation and flora	Flora and Vegetation Management Protocol (Section 4.2)	Minor	Remote	Negligible
	Disturbance to Declared Rare Flora	Flora and Vegetation Management Protocol (Section 4.2)	Severe	Remote (none present)	Negligible
	Impacts on fauna	Fauna Interaction Protocol (Section 4.6)	Minor	Remote	Negligible
	Spreading of weeds to detriment of native vegetation	Weed Management Protocol (Section 4.3)	Minor	Remote	Negligible
	Impacts on watercourses, wetlands, groundwater and surface waters	Dewatering and Water Disposal Management Protocol (Section 4.4) Watercourse Crossing Management Protocol (Section 4.7) Acid Sulphate Soil Management Protocol (Section 4.5)	Minor	Remote	Negligible
	Cultural heritage disturbance	Aboriginal Heritage Site Management Protocol (Section 4.14)	Minor	Remote	Negligible
	Noise	Noise and Vibration Management Protocol (Section 4.10)	Minor	Remote	Negligible
	Generation of dust that will impact on flora/fauna and local amenity	Dust Management Protocol (Section 4.9)	Minor	Remote	Negligible
Trenching and Excavation	Alteration to hydrological regimes (surface drainage) and sedimentation	Watercourse Crossing Management Protocol (Section 4.7)	Trivial	Unlikely	Low
	Soil erosion	Soil Management Protocol (Section 4.13)			
	Fauna impacts (injury/death by falling in trenches	Fauna Interaction Protocol (Section 4.6)			
	Damage to other land-uses	Management Measures not addressed in this plan			
	Disturbance of Acid Sulphate soils	Acid Sulphate Soil Management Protocol (Section 4.5)			
Drilling/boring	Soil erosion	Soil Management Protocol (Section 4.13)	Trivial	Unlikely	Low
	Sedimentation	Soil Management Protocol (Section 4.13)			

Activity	Potential environmental impact	Mitigation Measures	Consequence	Likelihood	Risk Level
	Disturbance of acid sulphate soils	Acid Sulphate Soil Management Protocol (Section 4.5)			
	Contamination of surface and groundwater	Acid Sulphate Soil Management Protocol (Section 4.5) Use of water based drilling fluids			
	Noise	Noise and Vibration Management Protocol (Section 4.10)			
Dewatering	Impacts on watercourses, groundwater and surface waters	Dewatering and Water Disposal Management Protocol (Section 4.4)	Minor	Remote	Negligible
	Disturbance of acid sulphate soils	Acid Sulphate Soil Management Protocol (Section 4.5)	Trivial	Remote	Low
Stringing and Welding	Potential to cause fire that will impact on flora, fauna and other land uses	Fire Management Protocol (Section 4.8)	Severe	Remote	Low
Lowering-in and backfilling	Trapping of fauna in trench	Fauna Interaction Protocol (Section 4.6)	Minor	Remote	Negligible
	Dust	Dust Management Protocol (Section 4.9)	Minor	Remote	Negligible
Clean-up and rehabilitation	Lack of vegetation can lead to erosion, sedimentation, visual amenity and alterations in hydrological regimes Disturbance to existing vegetation and faunal habitats	Rehabilitation Protocol (Section 4.15)	Severe	Remote	Low
	Dust	Dust Management Protocol (Section 4.9)	Minor	Remote	Negligible

2.5 Environmental objectives and performance criteria

Table 2-3 sets out the full range of environmental objectives and associated performance indicators for all aspects of the proposal.

Table 2-3: Environmental objectives and performance criteria

Issue	Objective	Performance Indicator
INCIDENT RESPONSE		
Environmental impact	To minimise and limit environmental impacts to the extent of the environmental approval.	Non-conformances with CEMP protocols.
Complaint	Investigate complaint and implement action to minimise future complaints.	Investigation completed. Remediation action undertaken. Complainant advised of outcomes.
Protocol	Protocols implemented to manage potential environmental impacts.	Protocol updated to minimise potential for future complaints.
FLORA AND VEGETATION		
Weeds and diseases	Prevent the introduction and dispersal of weeds.	The presence of weeds on the CROW is consistent with or better than adjacent land.
Disturbance to vegetation	Minimise and manage disturbance to vegetation.	All construction activities undertaken within the CROW. All areas of remnant vegetation (habitat) avoided outside the CROW.
Rehabilitation	Restoration of vegetation to meet specified completion criteria.	Achievement of compliance criteria, with exception of access road to remain.
WEEDS		
Introduction of new weeds	To minimise the potential for new weeds to be introduced into the pipeline easement from external sources.	No new species of weeds recorded in the pipeline easement within one year of completion of construction activities.
Threat of spreading weeds	To minimise the risk of spreading existing weeds along the easement and to adjacent areas.	Hygiene management stations located at edges of areas of conservation value and high risk areas. No significant change to the extent and distribution of weeds within one year of completion of construction activities compared to the extent and distribution of weeds prior to construction.
DEWATERING AND WATER DISPOSAL		
Water Quantity	To ensure that dewatering activities or water disposal do not extract excessive amounts of water that may be detrimental to the water resource.	No drawdown of the aquifer beyond the immediate proximity of the construction works from dewatering activities.
Water quality	To ensure that dewatering activities do not degrade the beneficial use of the aquifer or compromise the ecological value of nearby surface receptors.	No long-term detrimental impact to the aquifer compared to pre-construction background water quality from dewatering activities. Groundwater returned to the aquifer will meet or exceed pre-construction groundwater quality components. No greater than a 10% variation of water quality in nearby ecological receptors from dewatering activities.
ACID SULPHATE SOIL		
Acidification and release of metals	To ensure that there are no adverse impacts to sensitive receptors as a result of the excavation and stockpiling of acid sulphate soils.	Groundwater and surface water quality near the pipeline is not degraded as a result of soil disturbance activities. No visual acid sulphate soil oxidation impacts result from the stockpiling of acid sulphate soils.

Issue	Objective	Performance Indicator
FAUNA INTERACTION		
Fauna habitat	To minimise the temporary and permanent reduction or fragmentation of existing fauna habitat.	No habitat trees, or parts of habitat trees, other than those in the direct line of the proposed pipeline or that materially interfere with construction of the pipeline to be removed. No vegetation clearing to be undertaken outside approved areas.
Direct fauna impacts	To minimise the direct impacts on fauna through impacts with vehicles, entrapment in construction works, or extraordinary exposure to predators.	Vehicle speeds limited on unformed access tracks and construction worksite. Pipeline trenches to be open for a limited period of time. Achievement of fauna inspection and clearing requirements. Adherence to injured animal protocol.
WATERCOURSE CROSSINGS		
Disturbance to watercourses	Minimise and manage disturbance of watercourses.	No adverse impacts (for example to downstream ecology or land use) resulting from water body flow reductions, or diversions as a result of pipeline construction activities. No change in water body flows. No erosion of the water body intersecting or adjacent to the pipeline CROW.
Contamination of watercourses	Prevent contamination of watercourses from construction activities.	No direct discharge of dewatering water to watercourses. No decrease in natural surface or groundwater quality attributable to construction activities. No significant (in excess of 80 litres near wetlands and rivers) spills or leaks of hydrocarbons during construction and rehabilitation operations outside of areas designated for maintenance, refuelling or storage.
FIRE		
Prevent fires	To prevent fires occurring as a result of construction activities.	No pipeline construction related fires.
DUST		
Landholders	To minimise the temporary impact of dust emissions from construction activities, machinery and vehicles.	No reasonable substantiated complaints. Accordance with relevant policies. Acceptable ambient dust levels down-wind of the construction site.
Vegetation	To minimise the impact of dust on surrounding vegetation so long-term existence is ensured.	Health of vegetation adjacent to the CROW remains the same post-construction, as it was pre-construction.
NOISE		
Public/residents	To minimise the impact of noise and vibration emissions from construction activities, machinery and vehicles.	No reasonable landholder complaints. Land holder complaints resolved in a timely manner. Compliance with Environmental Protection (Noise) Regulations 1997.
WASTE		
Waste management	Minimise generation of waste during construction.	Minimise waste generation.
	Minimise pollution or environmental harm due to inappropriate disposal of waste.	No uncontained waste, rubbish or litter is found within the CROW or at facilities during construction. No waste found within CROW or at facilities immediately following construction. A waste register is maintained during construction indicating waste categories, approximate volumes of waste, and location of disposal. Waste material is contained and disposed of in accordance with Environment Protection Act 1986.

Issue	Objective	Performance Indicator
FUEL AND CHEMICAL STORAGE, SPILL AND EMERGENCY RESPONSE		
Contamination	Prevent contamination of groundwater, surface water and soil.	Chemicals and fuels stored and handled within designated areas. No significant spills or leaks of hydrocarbons (in excess of 80 litres near wetlands and rivers) during construction and rehabilitation operations outside areas designated for maintenance, refuelling or storage. No significant spills or leaks of hydrocarbons (in excess of 500 litres) during construction and rehabilitation operations outside of areas designated for maintenance, refuelling or storage.
SOIL		
Topsoil	Minimise change to soil profile from excavation activities.	No evidence of subsoil on surface (as detected by colour and texture) within CROW following backfill. No visual evidence of soil compaction following backfill and rehabilitation (e.g. hard soil, local water pooling).
Erosion	Prevent occurrence of soil erosion during and following construction.	The extent of soil erosion within the CROW during and within two years following construction is consistent with surrounding land. No visible soil erosion from CROW during or within three years following construction.
ABORIGINAL SITES		
Known (recorded) Aboriginal heritage sites	To avoid disturbance to Aboriginal heritage sites identified for protection near the pipeline easement.	No disturbance to Aboriginal heritage sites identified for protection.
New (unrecorded) Aboriginal heritage sites	To manage new Aboriginal heritage sites/artefacts uncovered or identified during construction in accordance with the requirements of the *Aboriginal Heritage Act 1972*.	All new Aboriginal heritage sites managed in accordance with the *Aboriginal Heritage Act 1972* and the land use agreement.
REHABILITATION		
Vegetation	To re-establish vegetation and associated habitat areas to the condition that it was in prior to disturbance or better.	Achievement of the completion criteria set out in Section 4.15.7.
Soil	To control sediment and erosion.	Achievement of the completion criteria set out in Section 4.15.7.

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3. Activity specific environmental management

The following management actions are to be undertaken at all times during the described activity for the project

3.1 General environmental management

Several of the environmental factors associated with the construction of the pipeline are likely to be encountered regardless of the activity to be undertaken. On this basis, the management actions outlined in Section 3.1.1 should be undertaken regardless of the activity. Additional management actions specific to the activity to be undertaken, are presented in Sections 3.2 to 3.10.

3.1.1 Required methods and actions

Issue	Action
Induction	Induction programs should include a session sufficient to ensure all personnel are aware of the environmental obligations prescribed within this CEMP. Personnel engaged in the various construction activities should be made aware of the specific management protocols that apply to their work activity, as set out in the following sections of this Chapter of the CEMP.
Location	Activities associated with pipeline construction shall be undertaken within the designated CROW unless otherwise approved.
	Disturbance shall be limited to the areas presented in the environmental review (Appendix 2).
Vehicle movements	Vehicles travelling on unformed access roads shall not exceed 80 km/hr.
	Vehicles travelling on the CROW shall not exceed 40 km/hr.
	Vehicles travelling within active construction areas shall not exceed 5 km/hr.
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).
Vegetation	Activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).
Weeds	All construction activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).
Threatened flora	Activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).
Dewatering and disposal of water	All dewatering activities and disposal of hydro-test water shall be managed in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).
Acid sulphate soils	Activities within areas designated on the ELL as being subject to potential acid sulphate soils shall be managed in accordance with the Acid Sulphate Soil Management Protocol (Section 4.5).
Fauna	Interactions within fauna during construction shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).
Watercourse crossings	Activities associated with construction of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).
Fire	Fire resulting from or threatening construction activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).
Dust	Dust emissions resulting from construction activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).
Noise	Noise emissions shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).
Soil	Activities involving movement of soil shall be managed in accordance with the Soil Management Protocol (Section 4.13).
Heritage	Activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).

Issue	Action
Rehabilitation	Cleanup and rehabilitation of all construction areas and campsites shall be managed in accordance with the Rehabilitation Protocol (Section 4.15).

3.2 Survey, fencing and service location

Survey crews will locate and accurately survey the pipeline alignment, and marking the centreline, bends and offsets along the alignment. A construction survey will be undertaken immediately prior to construction commencing, with pegs used to clearly delineate the CROW and areas of disturbance outside the CROW.

Temporary access gates will be installed in existing fences to provide access to the easement for machinery and vehicles. Fences will be reinstated at the completion of construction, with gates left for operational purposes or if required by the landowner. New fencing materials are used to reinstate fences, with gates recycled where possible.

Service location personnel will work ahead of clearing and grading to locate services (i.e. phone lines, mains water and sewerage lines, and poly water lines) and will be responsible for placing warnings and flagging for overhead powerlines.

3.2.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements, in particular reduced working widths, prior to start up.	Prior to the commencement of activities
	The CROW shall be clearly marked paying particular attention to reduced working widths as outlined in the ELL.	Prior to ground disturbing activities
	Features such as vegetation to be trimmed/retained, heritage sites, etc, shall be identified and flagged in accordance with the ELL.	Prior to ground disturbing activities
	Environmentally sensitive areas and “no-go” area boundaries (e.g. non-refuelling areas, hygiene stations and weed boundaries) shall be delineated and marked as outlined in the ELL.	Prior to ground disturbing activities
	All personnel shall be advised of additional environmental management requirements during inductions and toolbox meetings.	Prior to commencement of daily activities
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Vegetation	Activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Weeds	All surveying and fencing activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Surveying and fencing activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Fire	Fire resulting from or threatening surveying and fencing activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from surveying and fencing activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Heritage	Surveying and fencing activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.3 Clear and Grade

Clearing involves the removal and stockpiling of vegetation from the pipeline CROW, typically using bulldozers, graders or 'slashers', while grading involves the removal and separate stockpiling of topsoil for use during rehabilitation. Temporary sediment and erosion controls may be installed during clearing and grading operations.

3.3.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements, in particular reduced working widths, prior to start up.	Prior to ground disturbing activities
	Delineation of environmentally sensitive areas and the CROW shall be checked to ensure the extent of authorised clearing has been defined.	Daily
	All personnel shall be advised of additional environmental management requirements during inductions and toolbox meetings.	Daily: prior to daily activities
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Vegetation	Clear and grade activities shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Weeds	All clear and grade activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Clear and grade activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Fauna	Interactions with fauna during clear and grade activities shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).	At all times
Watercourse crossings	Clear and grade activities associated with construction of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	At all times
Fire	Fire resulting from or threatening clear and grade activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from clear and grade activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Soil	Clear and grade activities shall be managed in accordance with the Soil Management Protocol (Section 4.13).	At all times
Heritage	Clear and grade activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.4 Trenching and Excavation

Trenching is undertaken using a purpose-built trenching machine, with excavators required to dig the trench at tie-ins, bends, in very wet or boggy areas, in rocky areas, and in other areas where the use of the trenching machine is impractical. Excavators are also required to dig "bell holes[2]" and used to construct temporary erosion controls. Bell holes are usually benched and have ramped access points that enable personnel to enter the trench but also provide points for entrapped wildlife to leave the trench. Drilling and blasting may be undertaken where rock is encountered.

Dewatering will generally be avoided through wet trenching techniques, although it may be required where structural difficulties are encountered.

3.4.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements.	Daily, prior to ground disturbing activities
	Delineation of environmentally sensitive areas and the CROW shall be checked.	Daily
	All personnel shall be advised of additional environmental management requirements during inductions and toolbox meetings.	Prior to daily activities
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Vegetation	Trenching and excavation activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Weeds	Trenching and excavation activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Trenching and excavation activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Dewatering and disposal of water	All dewatering activities shall be managed in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times
Acid sulphate soils	Trenching and excavation activities within areas designated on the ELL as being subject to potential acid sulphate soils shall be managed in accordance with the Acid Sulphate Soil Management Protocol (Section 4.5).	At all times
Fauna	Interactions with fauna during trenching and excavation activities shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).	At all times
Watercourse crossings	Trenching and excavation activities associated with construction of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	At all times
Fire	Fire resulting from or threatening trenching and excavation activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from trenching and excavation activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions resulting from trenching and excavation activities shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times

[2] Bell holes are required to be constructed where pipe strings are joined, at mainline valves, at major bends, at facilities crossings, and where loop ends are tied into the existing pipeline or compressor station.

Issue	Action	Timing
Soil	Trenching and excavation activities involving movement of soil shall be managed in accordance with the Soil Management Protocol (Section 4.13).	At all times
Heritage	Trenching and excavation activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.5 Drilling and boring

Horizontal directional drilling (HDD) can be used for installing the pipe under watercourses and other features, and involves drilling at a shallow angle beneath the surface and pulling the pipe through the drill hole. Bentonite (drill mud) is a fine non-dispersive clay, which is used as the lubricant during drilling. It can be recycled but will need to be disposed of appropriately once HDD is complete. Bentonite is non-hazardous and hence disposal may involve reuse in dam lining to prevent leaks.

Boring is commonly used to install pipe beneath infrastructure such as roads, railways, etc, and involves the excavation of a large bell hole on either side of the crossing. A hole is hammered and/or drilled between the two bell holes, with spoil from the trench stockpiled on the CROW.

Unlike HDD, which provides a parabolic tunnel, boring provides a straight tunnel in which the pipeline is placed.

3.5.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements.	Weekly
	Delineation of environmentally sensitive areas and the CROW shall be checked.	Daily
	Liaise on additional management issues for the day.	Daily
	Additional management practices shall be included in toolbox meetings.	Prior to daily activities
General	HDD equipment shall be inspected prior to commencement of works to ensure it is in good working order.	As required
	HDD drilling sites shall be completely contained within an appropriate earthen bund.	At all times
	Topsoil shall not be used in the construction of the earthen bund.	At all times
	Drilling mud shall be contained in mud tanks or pits and de-sanded and recirculated during drilling.	At all times
	Only water based drilling fluids shall be used.	At all times
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Vegetation	Drilling and boring activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Weeds	All drilling and boring activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Drilling and boring activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Dewatering and disposal of water	All dewatering activities associated with drilling and boring shall be managed in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times
Watercourse crossings	Drilling and boring activities associated with construction of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	At all times
Fire	Fire resulting from or threatening drilling and boring activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from drilling and boring activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times

Issue	Action	Timing
Noise	Noise emissions resulting from drilling and boring activities shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Soil	Drilling and boring activities involving movement of soil shall be managed in accordance with the Soil Management Protocol (Section 4.13).	At all times
Heritage	Drilling and boring activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.5.2 Contingency action

Event	Action	Responsibility
Uncontrolled release of drilling mud	Cease operations. Stop mud entering surrounding environment (i.e. watercourse, vegetation). Investigate cause. Undertake required remedial action. Investigate and update protocol as required.	Construction Contractor

3.6 Pipe Stringing and Welding

This phase of pipeline construction involves delivery of the pipe to the construction area and its welding into continuous lengths known as pipe strings. The management actions relating to pipe stringing and welding are to minimise:

- adverse effects to fauna
- disruption to landowner, third parties and existing road networks.

3.6.1 Required methods and actions

Issue	Action	Timing
General	All pipe stringing activities (including stockpiling of pipeline sections) shall be confined to the CROW or other approved areas.	At all times
	All pipe welding activities shall be confined to the CROW.	At all times
	Defective machinery shall be shut down until the defect is rectified and the machine made safe for operations.	At all times
	Pipe shall be strung and mainline welded, allowing gaps for vehicles, stock and wildlife access across the CROW.	At all times
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Weeds	Pipe stringing and welding activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Pipe stringing and welding activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Fauna	Interactions with fauna during construction shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).	At all times
Fire	Fire resulting from or threatening pipe stringing and welding activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from pipe stringing and welding activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions resulting from pipe stringing and welding activities shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times

Issue	Action	Timing
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Heritage	Activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.7 Lowering-In and Backfill

Side booms or excavators are used in sequence to lift the welded pipe off the skids, move it over to the trench and position the pipe in the trench. The skids are removed and reused or, if damaged returned to the depot/yard for disposal. Jeeping[3] is often undertaken again at this point to ensure the coating has not been damaged, with damaged sections repaired prior to lowering in. The lowering-in crew may also be undertaking tie-ins, i.e. welding the long sections of pipe together in the trench.

Prior to lowering-in, a bedding layer may be placed in the base of the trench, with a padding layer placed around and on top of the pipe where trench conditions could damage the coating on the pipe. Bedding and padding material is screened material that does not have many large or sharp rocks that can damage the pipe coating or the pipe. Bedding material may be sourced by importing approved material or by screening trench spoil. Excavators or specialised padders will be used to place the bedding and padding carefully around the pipe.

Trench breakers are placed around the laid pipe to prevent tunnel erosion where the potential for this exists, e.g. steep slopes and on the banks of watercourse crossings. Trench breakers are constructed of cement, cement-stabilised sand bags or non-hazardous polyurethane foam, which expands and hardens once exposed to the air.

Backfill of the trench is undertaken after lowering-in and padding, with the spoil returned to the trench and compacted by rubber-tyred vehicles of a limited wheel load.

3.7.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements.	Daily
	Delineation of environmentally sensitive areas and the CROW shall be checked to ensure definition of the extent of authorised clearing.	Daily
	All personnel shall be advised of additional environmental management requirements during inductions and toolbox meetings.	Prior to daily start up
Timing	Where practicable, backfilling shall be within 0.5 km of lowering-in.	At all times
	Trenches shall be backfilled as soon as possible following pipe installation.	At all times
Backfill	The backfilled trench shall be compacted to reduce subsidence.	As required
	Surface contours shall be reinstated as soon as practicable.	Following backfill
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Weeds	All lowering-in and backfill activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Fauna	Interactions with fauna during lowering-in and backfill shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).	At all times
Watercourse crossings	Lowering-in and backfill activities associated with construction of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	At all times

[3] Jeeping refers to a process to test coated pipe with a high voltage current to evaluate the insulating effectiveness of the coating. The process is usually carried out prior to transport of the pipe to the site, but may also be undertaken after laying.

Issue	Action	Timing
Fire	Fire resulting from or threatening lowering-in and backfill activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from lowering-in and backfill activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions resulting from lowering-in and backfill activities shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Soil	Backfill activities shall be managed in accordance with the Soil Management Protocol (Section 4.13).	At all times
Heritage	Activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.8 Clean-up and Rehabilitation

The final phase of the project is Clean-up and Rehabilitation (Reinstatement), which involves:

- removing construction materials from the CROW (e.g. skids, palettes, etc).
- shaping the land surface to match the existing contours, including compacting material back into side cuts.
- ploughing or ripping of heavily compacted areas by graders.
- construction of final sediment and erosion controls from subsoil.
- respread topsoil across the CROW
- leaving a single vehicle width access track to service both adjacent pipeline easements.

In all cases the vegetation removed from the CROW will be respread to aid in sediment and erosion control, retain moisture, and to aid establishment of seeds/seedlings and revegetation of the CROW. Active rehabilitation (seeding) in remnant vegetation will only be conducted on areas that do not respond to the initial rehabilitation treatment, while seeding may be undertaken to re-introduce pasture in agricultural areas.

DSC will finalise rehabilitation objectives on private land with the concerned landowner, prior to ground disturbing activities. These objectives and specific environmental management requirements will be added to the environmental line list as required.

3.8.1 Required methods and actions

Issue	Action	Timing
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Clean-up and rehabilitation	Cleanup and rehabilitation of all construction areas and campsites shall be managed in accordance with the Rehabilitation Protocol (Section 4.15).	During and following cleanup and rehabilitation
Vegetation	Cleanup and rehabilitation activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2) and Rehabilitation Protocol (Section 4.15).	At all times
Weeds	All cleanup and rehabilitation activities shall be managed in accordance with the Weed Management Protocol (Section 4.3).	At all times
Threatened flora	Cleanup and rehabilitation activities within areas designated on the ELL as containing Threatened Flora shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Fauna	Interactions with fauna during clean-up and rehabilitation shall be managed in accordance with the Fauna Interaction Protocol (Section 4.6).	At all times

Issue	Action	Timing
Watercourse crossings	Cleanup and rehabilitation activities of watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	At all times
Fire	Fire resulting from or threatening cleanup and rehabilitation activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from cleanup and rehabilitation activities shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions resulting from cleanup and rehabilitation activities shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Soil	Cleanup and rehabilitation activities involving movement of soil shall be managed in accordance with the Soil Management Protocol (Section 4.13).	At all times
Heritage	Cleanup and rehabilitation activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.9 Testing and Commissioning

Hydrostatic testing (hydro-testing) involves filling the pipe with water and increasing the pressure to ensure the pipe can withstand the required pressure. Prior to hydro-testing commencing, agreement is usually sought from the controlling regulatory authority to source water from creeks, mains or bores, and to discharge the final water onto land surrounding the pipeline CROW. Once the test is complete, the water is pushed from the pipe by well-fitting plugs (known as pigs), with the controlled flow of water sprayed on to suitable areas surrounding the CROW. Once testing of the pipeline is complete, it can be commissioned.

3.9.1 Required methods and actions

Issue	Action	Timing
Environmental Line List (ELL)	The ELL shall be reviewed for specific environmental management requirements, in particular reduced working widths, prior to start up.	Prior to the commencement of activities
	All personnel shall be advised of additional environmental management requirements during inductions and toolbox meetings.	Prior to the commencement of daily activities
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Weeds	All testing and commissioning activities shall be managed in accordance with Weed Management Protocol (Section 4.3).	At all times
Disposal of water	All disposal of hydro-test water shall be managed in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times
Fire	Fire resulting from or threatening testing and commissioning activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Noise	Noise emissions resulting from testing and commissioning shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Heritage	Activities within or near areas designated on the ELL as being of Aboriginal heritage value shall be managed in accordance with the Aboriginal Heritage Site Management Protocol (Section 4.14).	At all times

3.10 Construction camp management

Construction camps shall be located in existing cleared areas where practical, removed from residences. Waste produced from the camp will include:

- food scraps and general domestic waste (putrescibles waste)
- recyclables, such as aluminium cans, bottles, steel and cooking oil
- wastewater – black and grey streams are generally combined.

Water for construction, campsites and hydro-testing of the pipeline will be drawn from surface water, groundwater or public water supply on a location specific basis.

3.10.1 Required methods and actions

Issue	Action	Timing
Planning	Camps shall be located in areas that have previously been disturbed/cleared.	Where possible
	The site for the accommodation camp shall be selected to minimise clearing.	As required
Incidents and complaints	All environmental incidents and complaints shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1).	At all times
Vegetation	Activities involving interaction with vegetation shall be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	At all times
Fire	Fire resulting from or threatening construction camp activities shall be managed in accordance with the Fire Management Protocol (Section 4.8).	At all times
Dust	Dust emissions resulting from construction or rehabilitation of the campsite areas shall be managed in accordance with the Dust Management Protocol (Section 4.9).	At all times
Noise	Noise emissions from campsite areas shall be managed in accordance with the Noise and Vibration Management Protocol (Section 4.10).	At all times
Fuels and chemicals	Handling and storage of all fuels and chemicals shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times
Waste	All campsite rubbish and waste materials shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times
Rehabilitation	Cleanup and rehabilitation of all campsites shall be managed in accordance with the Rehabilitation Protocol (Section 4.15).	At all times

4. Management protocols

The following management protocols (Sections 4.1 to 4.15) are to be followed for the various construction activities as directed in Section 3 and the Environmental Line List (ELL).

4.1 Environmental Incident Response Protocol

4.1.1 Background and environmental risks

Construction activities proposed to be undertaken as part of the project may inadvertently result in environmental impacts beyond the scope of the environmental approvals.

DSC proposes to manage environmental issues associated with the project such that there are no significant environmental impacts. However, it is important that should an environmental incident occur, or a complaint about an environmental issue be received, the issue is appropriately and efficiently managed to identify the cause and minimise potential re-occurrence.

4.1.2 Purpose and scope of protocol

This protocol provides for the management of environmental incidents and concerns raised by the public, to minimise potential re-occurrence.

4.1.3 Objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Environmental impact	To minimise and limit environmental impacts to the extent of the environmental approval.	No significant residual environmental effect. Environmental Protection Regulations 1987 Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Environmental Protection (Abrasive Blasting) Regulations 1998. CEMP protocols.	No non-conformances with protocols in this CEMP.
Complaint	Investigate complaint and implement action to minimise future complaints.	Environmental Protection (Noise) Regulations 1997 (Noise Regulations). Environmental Protection (Abrasive Blasting) Regulations 1998.	No unsubstantiated public complaints. Satisfactory resolution of all complaints.

4.1.4 Recordable and reportable incidents

Under the Petroleum Pipelines (Environment) Regulations 2012, a recordable incident means an incident arising from the pipeline activity that both:

- breaches an environmental performance objective or environmental performance standard in the environment plan for the pipeline activity
- is not a reportable incident.

A reportable incident means either:

- an incident that is classified as a reportable incident under the environment plan for the pipeline activity
- an incident arising from the pipeline activity if the incident has caused, or has the potential to cause, an adverse environmental impact; and under the environmental risk assessment process described in

Section 2.3 that environmental impact is categorised as moderate or more serious than moderate (see Section 4.1.5).

4.1.5 Incident level

The assessment of Hazard/Incidents that pose potential and actual significant threats to the environment shall be undertaken in order to learn from these Hazard/Incidents and prevent reoccurrence.

When classifying incidents, the Consequence Definitions from the DBNGP Risk Model (August 2008) shall be used (see Table 4-1). The level of analysis required will depend on the severity of the event (e.g. Trivial (1), Minor (2), Negligible (1), Severe (3), Major (4) or Catastrophic (5). Where more than one level is identified, the level of investigation will be determined by the highest risk rating. This level determines the management action and priority required to be undertaken following the incident.

Table 4-1: Environmental incident classification (as per DBNGP risk model)

	Impact on DBP	Environmental Impact	Loss
5 Catastrophic	Would threaten the survival of DBP without an additional unplanned equity contribution.	• Effects widespread; viability of ecosystems or species affected; or • Permanent major changes.	>$25 M
4 Major	Would threaten the effective operation of DBP for a substantial period, including its ability to raise capital, or have a significant effect on how DBP will operate in the future.	• Major off-site impact; long term (2 years or more) severe effects; rectification difficult; or • Major impact in an area of high conservation value or special significance (eg National Heritage list, Class A Reserves, National Parks, where the area of impact could be localized or very localized).	$10 M to $25 M
3 Severe	No threat to the effective operation of DBP, but exposes DBP to unacceptable cost consequences.	• Localised (<1 ha) and short-term (<2 yr) effects; easily rectified; or • Significant impact upon cultural and heritage sites; or rare and endangered flora/fauna; or • Chemical release contained with outside assistance resulting in the impacts described above.	$2.5 M to $10 M
2 Minor	No significant impact on DBP, issues are dealt with internally.	• Effect very localised (<0.1 ha) and very short-term (weeks), easily rectification; or • Minor impact upon cultural and heritage sites; or rare and endangered flora/fauna; or • Onsite chemical release that is contained without outside assistance with the impacts described above.	$0.5 M to $2.5 M
1 Trivial	No significant impact on DBP, issues are routinely dealt with by operational areas.	• No effect; or • Minor on-site effects rectified rapidly with negligible residual effect; or • Minor leak not contaminating.	<$0.5 M

4.1.6 Management actions

Issue	Action	Timing	Responsibility

Recording of Public complaint	Complainant details recorded, including:
	• name
	• address
	• contact details
	• recorded details of the incident, including:
	  ○ type of concern (dust/noise etc)
	  ○ time and date of concern
	  ○ duration of concern
	  ○ possible source of concern.
		At all times	Construction Contractor

Remediation	Rectifying or remedial action will be initiated.	Level 1	Construction Contractor

Issue	Action	Timing	Responsibility
Cease operations	All work activities directly causing an environmental incident shall be stopped immediately and corrective work procedures adopted. Rectifying or remedial action will immediately be implemented.	Level 2 or higher	Construction Contractor
Reporting	The Project Manager shall be advised of all Level 2, 3, 4 or 5 incidents as follows: • Level 2: within 24 hours • Level 3, 4 or 5: as soon as practicable within four hours.	As prescribed	Construction Contractor
	An Environmental Incident Report shall be completed and forwarded to the Project Manager.	Level 1 or higher	Construction Contractor
	Level 3, 4 and 5 incidents shall be notified to the Department of Environment and Conservation (DEC) and to the Department of Environment, Water, Heritage and the Arts (Environmental Protection Branch) where the incident involves matters pertaining to the *Environment Protection and Biodiversity Conservation Act 1999*.	As soon as becoming aware	DSC
	Reporting of incidents under the requirements of the *Petroleum Pipelines Act 1969* and Schedule of Onshore Petroleum Exploration and Production Requirements 1991 shall be carried out as detailed in Section 4.1.8 below.	See Section 4.1.8	DSC
Incident level	The impact level of an environmental incident shall be determined from the table provided above.	As soon as practical	Construction Contractor
Mitigation	Measures to limit the impact of Level 4 and 5 incidents on the environment shall be implemented.	As soon as practical	Construction Contractor
Procedural changes	The causes and effects of the incident, and actions to prevent the incident from reoccurring shall be discussed and documented in the Environmental Incident Report.	As soon as practical	Construction Contractor
	Recommended changes to management protocols shall be implemented.	As soon as practical	Construction Contractor
	The Environmental Incident Report shall be 'signed-off' following agreement on new procedures to prevent reoccurrence of the incident, and on any further remedial action required to mitigate impacts to the satisfaction of DSC and any regulatory authorities that were involved.	As soon as practical	Construction Contractor
	Any new procedures arising from the Environmental Incident process shall be added to the CEMP following Document Control procedures.	As soon as practical	DSC

4.1.7 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Recording of environmental incidents	As required	Environmental Incident Register	Ensure environmental incidents and resolutions are recorded	Construction Contractor

A record of all environmental incidents, including complaints, will be maintained in an Incident Register, and will include details of the action implemented to minimise potential reoccurrence.

4.1.8 Reporting

Under the *Petroleum Pipelines Act 1969* and Schedule of Onshore Petroleum Exploration and Production Requirements 1991, significant incidents must be reported to DMP. This is for incidents within the Pipeline Licence area(s). Incidents outside the Pipeline Licence area(s) are covered under the *Environmental Protection Act 1986* and must be reported to the Department of Environment & Conservation. Initial notice to DMP shall be verbal and must be provided at the earliest practicable opportunity, within 24 hours, and initial report within 3 days after the first occurrence of the accident or incident; or the detection of the accident or incident by the operator (unless a written extension is obtained). DSC is responsible for reporting incidents to DMP.

Reportable incidents include:

- leakage or escape of dangerous goods to the environment
- spills of >500 L hydrocarbons to land

- spills of hydrocarbons or other materials (such as drilling fluids, chemicals, produced formation water or substances that have the potential to adversely affect the surface vegetation, soil or subsurface ground water) that affects a ground surface area greater than 100 m^2
- uncontrolled escape of >500 m^3 of gas
- an unplanned potentially hazardous event
- discharge of ozone depleting substances (during servicing or refrigeration or air conditioning equipment) inappropriate waste disposal causing environmental pollution.

Contact Details:

DMP 24-Hour Reporting Number: 0419 960 621

DMP Reporting Email: petroleum.environment@dmp.wa.gov.au.

A report in writing of any occurrence referred above shall be submitted to the Director as soon as practicable after the occurrence specifying:

- the date, time and place of the occurrence
- the estimated quantity of liquid that escaped or burned
- particulars of damage caused by the escape of ignition
- the events so far as they are known or suspected that caused or contributed to the escape or ignition
- particulars of methods used to control the escape or ignition
- particulars of methods used or proposed to be used to repair property damaged by the escape or ignition
- measures taken, or to be taken, to prevent a possible recurrence of the escape or ignition.

4.1.9 External complaint resolution

Following sign-off of an incident reported from external sources, the Construction Contractor will advise the complainant of the outcomes of the investigation and any action taken to resolve their concerns and minimise potential re-occurrence. The Incident Register shall include a Section providing for sign-off on stakeholder consultation.

4.1.10 Non-environmentally related complaints

This protocol relates specifically and only to environmentally related complaints.

4.2 Flora and Vegetation Management Protocol

4.2.1 Background and environmental risks

The project requires removal of native vegetation from areas that have been largely previously disturbed, to enable access to the pipeline easement. This vegetation is a resource as it provides habitat for fauna, contains seed that assists in revegetation and stabilises the soil profile. However, the cleared vegetation may contain weeds, which if not adequately managed, may spread into unaffected areas. Further, stockpiling or burning of the cleared vegetation may increase the fire hazard associated with construction activities. Consequently, effective management of vegetation within the easement is required during removal, storage and re-use, to ensure the environmental risks are minimised and the resource is efficiently utilised.

4.2.2 Purpose and scope of protocol

The purpose of this protocol is to provide for management of flora and vegetation to ensure that clearing of the resource is minimised, the resource (vegetation) is reused, the risk of spreading weeds is reduced, and to set out the necessary actions to address and minimise the potential impacts to Threatened Flora. The protocol will apply to the full length of the pipeline easement and all areas required for construction-related activities and facilities. This protocol should be read in conjunction with the Weed Management Protocol (Section 4.3).

For the purposes of this protocol, “habitat trees” refers to trees with a trunk of diameter greater than 30 cm at breast height, irrespective of evidence of use or potential for use by fauna.

4.2.3 Environmental objectives and key performance criteria

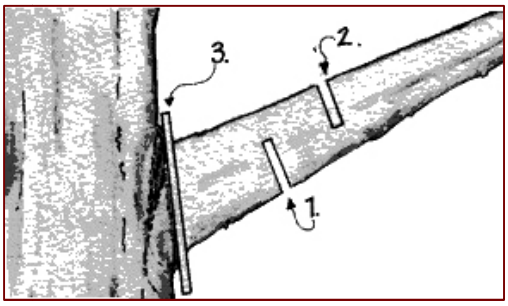
Issue	Objective	Performance standard	Management criteria
Disturbance to vegetation	Minimise and manage disturbance to remnant vegetation.	Environmental Protection (Clearing of Native Vegetation) Regulations 2004. DBP Flora and Vegetation Management Procedure. Weed and Pathogen Procedure.	All construction activities undertaken within the boundaries of the designated areas of disturbance in the native vegetation clearing permit. Conformance with the conditions of the native vegetation clearing permit. All areas of remnant vegetation (habitat) avoided outside the CROW.
Weeds and diseases	Prevent the introduction and dispersal of weeds.	*Agriculture and Related Resources Protection Act 1976.* Weed and Pathogen Procedure. CEMP Weed Management Protocol (Section 4.3).	The presence of weeds on the CROW is consistent with or better than adjacent land.
Disturbance to Threatened Flora and Threatened Ecological Communities	To minimise the disturbance or clearing of Threatened Ecological Communities and Threatened Flora, including Declared Rare Flora and Priority Flora species listed under the *Wildlife Conservation Act 1950* and Threatened Flora and Ecological Communities listed under the *Environment Protection and Biodiversity Conservation Act 1999.*	*Wildlife Conservation Act 1950* and associated regulations.\ *Environment Protection and Biodiversity Conservation Act 1999.*	No disturbance or clearing to Threatened Flora species other than that approved under licence to take. The width of the CROW reduced to prevent or minimise disturbance to Threatened Ecological Communities and Threatened Flora populations.

4.2.4 Management actions

Activity	Action	Timing	Responsibility
General requirements	The induction program shall include information regarding flora and vegetation management practices.	Prior to and during construction	Construction Contractor

Activity	Action	Timing	Responsibility
	Personnel shall be provided with information regarding Threatened Flora and the management practices at toolbox meetings on loops where the plants have been identified.	As required	Construction Contractor
	Burning of vegetation shall not occur.	At all times	Construction Contractor
	A construction survey will be undertaken immediately prior to construction commencing, with pegs to clearly delineate the CROW and all areas of disturbance outside the CROW. Records of the delineation are to be made as set out in Section 4.2.5 (Monitoring and recording) below.	Prior to ground disturbing activities	Construction Contractor
	Campsites in any vegetated areas shall provide space for firebreaks on all sides of the site that are contiguous with such vegetation. The firebreaks need not be cleared unless there is clear and immediate risk of fire, but should be delineated as part of the campsite, prior to any clearing for the facility.	Prior to ground disturbing activities	Construction Contractor
	No construction activities shall be undertaken outside the delineated CROW and areas of disturbance unless specifically approved.	At all times	Construction Contractor
	All turkey nests, turnarounds for vehicles and other infrastructure shall be located within existing cleared areas where possible.	At all times	Construction Contractor
	No vegetation flagged for protection shall be removed.	At all times	Construction Contractor
Weeds	Refer to the Weed Management Protocol (Section 4.3).	At all times	Construction Contractor
Clear and grade	Trimming of branches on flagged vegetation overhanging the easement shall be undertaken in preference to whole tree removal. All habitat trees flagged for either removal or branch trimming within DEC managed estate will require signoff by the local DEC district representative.	Where appropriate	Construction Contractor
	Trimming overhanging branches shall be undertaken using the 'three-cut method' to prevent bark stripping (see Figure 4-1).	As required	Construction Contractor
	No flora or vegetation outside approved areas shall be removed or disturbed.	At all times	Construction Contractor
Stockpiles	Cleared vegetation and log debris shall be stockpiled along the CROW separately from topsoil.	At all times	Construction Contractor
	Stockpiles shall be located adjacent to where vegetation has been cleared.	At all times	Construction Contractor
	Stockpiles shall be located so as not to impede vehicles, wildlife, and surface drainage, and avoid damage to adjacent live vegetation.	At all times	Construction Contractor
Welding	Welding activities shall be in accordance with the Fire Management Protocol (Section 4.8).	At all times	Construction Contractor
Pressure testing	No hydro-test water shall be sourced from local groundwater that may cause a detrimental effect to any known Threatened Flora.	At all times	Construction Contractor
	No hydro-test water shall be discharged into areas supporting Threatened Flora.	At all times	Construction Contractor
	Hydro-test water shall be disposed of in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times	Construction Contractor
Revegetation	Stockpiled cleared or trimmed vegetation shall be respread evenly across the CROW and other work areas from which it was removed as soon as practicable after the completion of construction works.	Following topsoil spreading	Construction Contractor
	Vegetative material including logs and leaf litter shall be respread to provide habitat.	As required	Construction Contractor
Reporting	All incidences of clearing or disturbance of Threatened flora without the necessary approvals shall be reported via the Incident Report Form and DEC notified.	As occurring	Construction Contractor (Incident Report) and DSC (DEC)

Figure 4-1 : Three cut method of branch pruning



4.2.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Photographic evidence and GPS coordinates of on-ground delineation of proposed disturbance areas	Prior to ground disturbance on relevant loop	All areas of proposed disturbance of native vegetation	To record incidences of clearing of vegetation and/or flora outside approved construction areas	Construction Contractor
GPS coordinates of all marked habitat trees	Prior to ground disturbance on relevant loop	All areas of conservation value	To record habitat tree locations	Construction Contractor
Clearing of native vegetation	As clearing occurs	All areas of clearing of native vegetation	To provide record of areas of clearing of native vegetation	Construction Contractor
Weed cover and species monitoring	Following rehabilitation	Entire easement length	The results will be used to develop weed management programs in consultation with DEC.	Construction Contractor

4.2.6 Contingency actions

Trigger	Action	Responsibility
Sites identified as weed infested.	Active weed control shall be required for at least one year after construction. Additional appropriate control measures shall be utilised after this time, based on monitoring results.	DSC
Clearing occurs outside approved areas or extent of any approvals	Determine extent of clearing. Determine activity that caused the clearing. Review the Flora and Vegetation Management Protocol. Implement rehabilitation measures as soon as practicable. Record incident in Incident Register.	Construction Contractor

4.3 Weed Management Protocol

4.3.1 Background and environmental risks

Construction activities have the potential to introduce or disperse weeds. The highest risk of weed will be during clear and grade operations and rehabilitation.

The highest risk of weed spread will be during the clear and grade and rehabilitation operations as weeds will be contained within the topsoil. As such, machinery associated with these operations will be cleaned down to remove all soil/organic matter when moving from disturbed/cleared areas into undisturbed areas. Removal of topsoil will sufficiently reduce the risk of weed spread during other construction activities.

Areas of surveyed occurrence of weed infested areas will be marked on the Environmental Line List (ELL). Easement access hygiene points will be marked on the construction alignment sheets.

4.3.2 Purpose and scope

The purpose of this protocol is to provide for the management of construction activities to prevent the introduction and spread of weeds along the easement and associated construction areas, to achieve the environmental objectives outlined below.

4.3.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Introduction of new weeds	Minimise the potential for new weeds to be introduced into the easement from external sources.	*Agriculture and Related Resources Protection Act 1976.* Weed and Pathogen Procedure.	No new species of weeds recorded in the pipeline easement within one year of completion of construction activities.
Threat of spreading weeds	Minimise the risk of spreading existing weeds along the easement and to adjacent areas.	*Agriculture and Related Resources Protection Act 1976.* Weed and Pathogen Procedure.	Hygiene management stations located at edges of areas of conservation value and high risk areas. No significant change to the extent and distribution of weeds within one year of completion of construction activities compared to the extent and distribution of weeds prior to construction.

4.3.4 Management actions

Activity	Action	Timing	Responsibility
Induction	The induction program shall involve hygiene training to ensure all personnel are aware of the requirements to prevent the spread of weeds.	Induction	Construction Contractor
General requirements	Field surveys shall be completed to identify areas of significant populations of Declared Plants, as defined by the Department of Agriculture and Food (DAF), and aggressive environmental weeds, which are aggressive and invasive and which may threaten the integrity of native plant communities (identified in consultation with DEC). These areas shall be marked as 'high risk' weed areas on the ELL.	Prior to ground disturbing activities	DSC
	Construction areas containing native vegetation and displaying weed covers in excess of 50% shall be selectively sprayed with Glyphosate to reduce weed seed loads in the topsoil in order to improve establishment of native species in the rehabilitation." Where such weeds are of a variety not conducive to eradication with Glyphosate, they shall be cleared and the weeds disposed of to an appropriate landfill. Construction areas that are heavily infested with weeds but not containing native vegetation shall also be cleared and the weeds disposed of to an appropriate landfill.	Prior to ground disturbing activities	Construction Contractor

Activity	Action	Timing	Responsibility
Access and vehicular /machinery movement	All vehicles and machinery that will access the CROW shall be checked to ensure they are free from soil/organic matter prior to arrival on site (recorded as part of the mobilisation procedure) and marked accordingly.	Prior to entering the easement	Construction Contractor
	Personnel shall remain on designated roads and access tracks and shall not go outside approved access areas.	At all times	Construction Contractor
	Vehicles that move off the CROW but remain on bitumen or hard surfaces do not require clean down prior to entering areas of the easement with the same risk rating.	At all times	Construction Contractor
Surveying	Distinctive flagging and signage shall be used to identify those areas of high risk for weeds and those areas known to be weed free.	Prior to ground disturbing activities	Construction Contractor
	Easement access hygiene points shall be identified on construction alignment sheets.	Prior to ground disturbing activities	Construction Contractor
	Easement access hygiene points shall be flagged in the field.	Prior to ground disturbing activities	Construction Contractor
	Flagging indicating weed infested areas shall remain in place until after rehabilitation works are complete.	At all times	Construction Contractor
Hygiene	Entry to areas identified as weed infested in the ELL will only be through hygiene stations.	Prior to construction	Construction Contractor
	Hygiene stations shall be at least 200 m from any watercourses/streams, environmentally sensitive areas and vulnerable areas provided no risk of contamination exists from within the area between the hygiene station and the area to be protected (hygiene buffer area). Where such risk of contamination may exist, the station shall be located as far from the area to be protected as will practically ensure no risk of contamination is present from the resulting hygiene buffer area.	At all times	Construction Contractor
	Signage shall be erected outlining the hygiene management procedure at each station.	At all times	Construction Contractor
	All construction machinery, including handheld tools, and vehicles shall be cleaned down at the hygiene management stations.	At all times	Construction Contractor
	Personnel shall clean footwear each time they enter or exit a high risk area.	At all times	Construction Contractor
	If weed seeds and/or soil are found attached to vehicles, footwear, clothing and/or equipment, they shall be collected in a sealed container and disposed in accordance with the Waste Management Protocol (Section 4.12).	At all times	Construction Contractor
Clear and grade	All topsoil within identified weed infested areas shall be stockpiled within the infested area and not with topsoil from uninfested areas.	At all times	Construction Contractor
Trenching	Stockpiles of weed and weed-free material shall be kept separate.	At all times	Construction Contractor
	Drainage for weed infested areas shall be designed so that it prevents water draining into weed free areas.	At all times	Construction Contractor
Bedding material	Bedding material imported to the site shall be certified as free of weeds.	As required	Construction Contractor
Rehabilitation	Stockpiles of weed and weed-free material shall only be re-spread back to their point of origin.	At all times	Construction Contractor

4.3.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Stockpiles of topsoil and trench material	Daily	All access and construction activities.	To ensure that high risk weed infested material is stockpiled separately from other material.	Construction Contractor

Parameter	Frequency	Location	Purpose	Responsibility
Digital photographs[8] of respreading of stockpiles in weed infested areas	During stockpile respreading for rehabilitation	At each location that infested stockpiles are respread for rehabilitation	To provide evidence of respreading of infested material being confined to source location	Construction Contractor
Hygiene stations	Daily	Identified hygiene stations. Entry of 'high risk' and conservation areas. Exit of 'high risk' areas.	To ensure that all vehicles, construction machinery including handheld tools, and footwear is subject to hygiene management procedures on entering/exiting high risk areas.	Construction Contractor
Vehicle hygiene	Each passing of a hygiene station	All hygiene stations	To record vehicle clean-downs as required to be undertaken	Construction Contractor
	All vehicle transfer between loops	Pre-entry to loop	To ensure all vehicles entering a loop are clean	Construction Contractor

4.3.6 Contingency actions

Trigger	Action	Responsibility
New infestation of weed(s) identified in areas of conservation value during construction	Identify source of weed infestation.	Construction Contractor
	Undertake weed control immediately (or as appropriate) in consultation with the Department of Agriculture and Food (DAF) and DEC and follow up weed control during Clean-up and Rehabilitation.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
New infestation of 'high risk' weed(s)	Identify source of weed infestation.	Construction Contractor
	Undertake weed control immediately (or as appropriate) in consultation with the DAF and DEC and follow up weed control during Clean-up and Rehabilitation.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
Weed infested and non-infested material are not stockpiled separately	Investigate cause of 'contamination'.	Construction Contractor
	Ensure appropriate identification of high risk areas for environmental weeds.	Construction Contractor
	Dispose infested stockpiled material off-site to a suitable disposal location, to be determined in consultation with DEC and DAF, to avoid contaminating non-infested areas.	Construction Contractor
	Source weed free material suitable for use in backfilling in consultation with DEC and DAF.	Construction Contractor
	Review hygiene management procedures.	Construction Contractor
Reporting	Any breaches of the hygiene management procedures shall be reported to DSC and DMP and investigated.	Construction Contractor

4.3.7 Hygiene management procedures

Disturbed areas along the pipeline route may contain a number of environmental weeds. Hygiene operations will be required to reduce the risk of spreading weeds into undisturbed areas of the CROW. Any locations and boundaries of weed infestations will be identified on a map if recorded, and included in the ELL.

The primary method for vehicle clean-down in the field will be by blow-down rather than wash-down. Wash-down is acceptable for the main site office if the vehicles are able to air dry whilst driving on the bitumen road before entering the CROW. Vehicle wash-down on the CROW is considered inappropriate, as it would provide wet surfaces for adhesion of soils and organic materials. However, wash-down will be required on the CROW during significant rain events when air drying is impractical.

[8] Original digital photographs should be retained to ensure files contain details of photograph (date and time taken, etc.).

Clean down for footwear and handheld tools where required is to follow standard clean down protocols (possible methods to be employed include water wash downs and brush downs).

4.3.8 Clean down procedures

Clean down operations will involve:

- laying timber skids across boundary (e.g. between infested areas and non-infested areas, boundary to areas of conservation value, etc.)
- cleaning vehicles/construction machinery using an air blower or high pressure water (e.g. to clean rake bucket and rake blade and undercarriage of machines and tyres etc.) inside the boundary of the disturbed/undisturbed area
- driving machinery from disturbed area onto timber skids
- cleaning tracks/wheels of machinery as the machine drives along the timber skids into the undisturbed area
- logging machinery hygiene inspections in machine daily log books
- audit of vehicle hygiene operations in the field
- conducting a clean down of all vehicles that accessed the CROW prior to them leaving the site.

4.3.9 Environmental weeds

Topsoil in the identified disturbed and cleared areas is potentially infested with environmental weed seeds. The machinery involved in the clear and grade, and rehabilitation operations will need to be cleaned down to remove all soil and/or organic matter when moving from disturbed/cleared areas into undisturbed areas. This will minimise the risk of spreading weed seeds and disease into undisturbed areas.

Environmental weeds will be dealt with on a case by case basis. Where infestations are extreme and contained only within the CROW, measures for their removal will be implemented. Declared plants and other invasive species will be controlled with herbicide, as advised by DAF, or where possible removed by hand to ensure underground corms are eradicated during rehabilitation monitoring after construction (refer to the Clean-up and Rehabilitation Management Protocol - Section 4.15).

4.3.10 Clean-up and rehabilitation

Weed monitoring and management requirements have been included into the Clean-up and Rehabilitation Management Protocol (Section 4.15). As part of this protocol, the project footprint will be inspected for weed outbreaks approximately 4–6 weeks after the first significant rainfall event (greater than 5 mm). Active control of weed outbreaks in previously uninfested areas along the CROW will be carried out in consultation with the relevant authorities.

4.4 Dewatering and Water Disposal Management Protocol

4.4.1 Background and environmental risks

Construction of the project requires clearing and grading, excavation, pipe-laying, backfilling, hydro-testing, rehabilitation and commissioning activities to be undertaken along the pipeline alignment. There will be a requirement for construction camps, stockpile sites, small worksites, access roads and water storage facilities (turkey nests) associated with these works. The following activities may require dewatering to facilitate construction works if shallow groundwater/surface water is encountered:

- trenching
- bell holes[9]
- watercourse crossings.

4.4.2 Purpose and scope of protocol

The purpose of this protocol is to provide for:

1. The management of dewatering and the preservation of environmental water quality during excavation and dewatering to achieve the environmental objectives for the water management factor (Section 4.4.3).
2. The management of abstraction and disposal of groundwater associated with dewatering and post-construction hydro-testing of the pipeline.

4.4.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Water quantity	To ensure that dewatering activities do not extract excessive amounts of water that may be detrimental to the water resource.	Dewatering licences under *Rights in Water and Irrigation Act* 1914.	Compliance with *Rights in Water and Irrigation Act* 1914 licence conditions.
Water quality	To ensure that dewatering activities or water disposal do not degrade the beneficial use of the receiving waters or compromise the ecological value of nearby surface receptors.	Dewatering licences under *Rights in Water and Irrigation Act* 1914. Environmental Protection (Unauthorised Discharges) Regulations 2004. DoW Water Quality Protection Note 13 (DoW 2006)	No long-term detrimental impact to the receiving waters compared to background water quality. Groundwater returned to the aquifer will meet or exceed pre-construction groundwater quality components. No greater than a 10% variation of water quality in nearby ecological receptors from dewatering activities.

4.4.4 Management actions

Issue	Action	Timing	Responsibility
DEWATERING MANAGEMENT			
Timing of Dewatering	Where practicable, earthworks in areas requiring dewatering shall be undertaken during summer and autumn months when water table levels are annually low.	During construction	Construction Contractor
	Where trench dewatering is undertaken at any location, it shall be undertaken as one continuous action to prevent the trench from periodically refilling with water overnight and endangering fauna (that is, dewatering should not be undertaken intermittently).	During construction	Construction Contractor

[9] Bell holes are constructed where pipe strings are joined, at mainline valves, at major bends, at facilities crossings, and where loop ends are tied into the existing pipeline or compressor station. Bell holes are usually benched and have ramped access points that enable personnel to enter the trench but also provide points for entrapped wildlife to leave the trench.

Issue	Action	Timing	Responsibility
Area of Impact	Dewatering shall be undertaken using a method that minimises the area of impact.	During construction	Construction Contractor
	Dewatering of trenches and bell holes shall be undertaken at a rate such that the drawdown cone will not affect surrounding water bodies, and groundwater dependent ecosystems (i.e. no drawdown at surface water bodies).	During construction	Construction Contractor
Acid Sulphate Soil areas	In acid sulphate soil risk areas, dewatering product shall be treated in accordance with specific requirements set out in the Acid Sulphate Soil Management Protocol (Section 4.5).	During construction	Construction Contractor
Disposal	Disposal of dewater product shall be undertaken through use for dust suppression in the first instance.	During construction	Construction Contractor
	Disposal of dewater product shall be undertaken by transport to a Turkey Nest for re-infiltration in the second instance.	During construction	Construction Contractor
	Where disposal to a Turkey Nest is not practicable, dewater product shall be disposed of to ground in a manner that ensures that standing water does not remain present beyond the CROW for a period of more than 3 days.	During construction	Construction Contractor
	Disposal of trench water shall be undertaken in a manner that shall avoid soil erosion, through the use of flow diffusers and energy dissipaters. Disposal shall avoid damage to remnant vegetation.	During construction	Construction Contractor
	Disposal will comply with DoW requirements as set out in Water Quality Protection Note 13 (DoW 2006).	During construction	Construction Contractor
Record keeping	Daily estimates shall be made of volumes abstracted. Field measurements of water levels and physical parameters shall also be recorded along with any visual observations made regarding water quality.	During construction	Construction Contractor
HYDRO-TESTING			
Disposal	Water used for hydro-testing shall be disposed of direct to Turkey Nests for re-infiltration or, if quality of water allows, disposed of to ground in a manner that ensures that erosion is prevented and standing water does not remain present beyond the CROW for a period of more than 3 days. Disposal will comply with DoW requirements as set out in Water Quality Protection Note 13 (DoW 2006).	During construction	Construction Contractor
	No hydro-test water shall be discharged within areas supporting Threatened Flora.	During pressure testing	Construction Contractor

4.4.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
DEWATERING				
Abstraction Volumes	Daily.	Pumps.	To estimate dewatering volumes.	Construction Contractor
Water level	Daily during dewatering in a given area and for a period of 1 week post-dewatering then monthly for a period of 6 months.	Relevant temporary piezometers.	To monitor the impacts of dewatering on water resource.	Construction Contractor
Field pH, EC, total acidity	Daily during dewatering in a given area.	In areas where acid sulphate soils are found, and at relevant pump outlets, and holding basin outlets.	To provide an early indication of potential adverse impacts from dewatering on acid sulphate soils.	Construction Contractor
GROUNDWATER ABSTRACTION – HYDRO-TESTING				
Abstraction Volumes	Daily.	Pumps.	To estimate abstraction volumes.	Construction Contractor

4.4.6 Contingency actions

Trigger	Action	Responsibility
Long-term deterioration of groundwater/surface water quality	Investigate and identify cause.	Construction Contractor
	Develop and implement a suitable groundwater and soil management strategy to mitigate impacts.	Construction Contractor
Lack of re-infiltration	If re-infiltration of dewatering effluent cannot be achieved through any of the options provided, dewatering effluent shall be disposed of off-site, to an approved location.	Construction Contractor

4.4.7 Recording

Records shall be kept of all areas where dewatering occurs. These shall include (where practicable): date, location (KP), looping number, UTM, datum (WGS84 or similar), volumes of water abstracted and methods of groundwater treatment. Results of any field testing and stockpile inspections undertaken shall be recorded.

Records shall be kept of the dates of abstraction for hydro-testing water, volumes abstracted and location of disposal.

4.5 Acid Sulphate Soil Management Protocol

4.5.1 Background and environmental risks

Acid sulphate soil is the common name for soil that contains iron sulphide or sulphide oxidation products. When acid sulphate soils are exposed to air and water, the iron sulphides can oxidise to produce sulphuric acid, iron precipitates and groundwater with elevated concentrations of dissolved metals such as aluminium, iron and arsenic. Although these materials are typically benign when undisturbed in their natural environment, the dewatering, excavation and/or stockpiling of acid sulphate soils that lies below the naturally occurring watertable may promote the occurrence of these adverse environmental impacts.

The project will result in the excavation and dewatering of potential acid sulphate soils at the northern end of the alignment. These activities could potentially result in the oxidation of acid sulphate soils in this area.

The potential for occurrence of acid sulphate soils occurring within the proposed excavation footprint was assessed through the use of key indicators such as geology, wetlands, depth to groundwater and vegetation, and classified as HIGH (almost certain), MEDIUM (likely), MED-LOW (possible in isolated circumstances), and LOW (unlikely). The results of the assessment are set out in the ELL. Detailed acid sulphate soil treatment plans were prepared for the areas of potential acid generation and the plans are presented in Appendix 5.

4.5.2 Purpose and scope of protocol

The purpose of this protocol is to provide for the management of acid sulphate soils during excavation and dewatering to achieve the environmental objectives for the acid sulphate soil factor (Section 4.5.3).

4.5.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Acidification and release of metals	To ensure that there are no adverse impacts to sensitive receptors as a result of the excavation and stockpiling of acid sulphate soils.	*Environmental Protection Act 1986* (Part V).	Groundwater and surface water quality near the pipeline is not degraded as a result of soil disturbance activities. No visual acid sulphate soil oxidation impacts result from the stockpiling of acid sulphate soils.

4.5.4 Management actions

Issue	Action	Timing	Responsibility
Acid sulphate soil surveys	Pre-construction acid sulphate soil surveys shall be undertaken in areas where there is a HIGH or MEDIUM risk of the presence of acid sulphate soils. Results shall be included in the Environmental Line List (ELL) and specific management plans developed for handling soils in these areas.	Prior to clear and grade	DSC
	No excavation or dewatering operations shall commence on any loop until the pre–construction field survey for that loop is complete, site specific acid sulphate soil management plans are approved by DEC and the ELL has been updated with the results of the survey.	Prior to construction	DSC
	Soils in the MED-LOW risk areas with potential for excavation below the watertable shall be in-field tested prior to excavation for field pH (pHF) and field pH after oxidation with hydrogen peroxide (pHFOX) at a rate of 1 sample per 200 m3 of soil expected to be excavated.	During excavation	Construction Contractor
	Acid sulphate soils shall be managed in accordance with both this protocol and the acid sulphate soil treatment plans (see Appendix 5).	During construction	Construction Contractor

Issue	Action	Timing	Responsibility
Trench management	Segments of the trench that occur within the HIGH, MEDIUM, and MED-LOW acid sulphate soil risk areas shall be excavated in lengths that permit opening and closing of the trench within a period not to exceed 48 hours to minimise the opportunity for the oxidation of soils. A sufficient number of machines capable of backfilling trenches are to be kept immediately available on the relevant loops while trenches are open, with sufficient aggregated backfilling capability to ensure the 48 hour requirement can be met. Note: All machines with backfilling capability are to be pre-rated as to their backfilling capability in terms of kilometres of trench/hour.	During construction	Construction Contractor
Soil treatment	Soils excavated from the LOW risk areas do not require active treatment or management.	During construction	Construction Contractor
	Soils excavated from the MED-LOW area do not require active treatment or management unless in-field testing indicates that pH_F <4 and pHFOX 3. If pH_F<4 and pH_{FOX} <3 then the soils shall be: • underlain by a 0.1 m guard layer of aglime or equivalent before being re-emplaced in the trench, or • uniformly treated with sufficient neutralising agent using an alternative method approved by the DEC.	During construction	Construction Contractor
	Soils within the MEDIUM and HIGH risk areas that are confirmed to be potentially acid generating as evidenced by a sulphide content: for coarse sandy soils (clay content <5%) of 0.03%S, for sandy loam to light clay (clay content <40%) of 0.06%S and for clayey soils with clay content >40% of 0.1%S shall, in the case of dry soils be uniformly treated with sufficient neutralising agent in accordance with DEC requirements. The amount of neutralising agent at any location shall be based on the laboratory defined %S concentration with a 1.5 safety factor. Approved treatment methods include either of the following: 1. Prior to excavation of the trench, a layer of neutralising agent (aglime or lime sands) shall be laid along the trench line, within the width of the expected excavation. The thickness of the neutralising layer shall be based on the laboratory defined %S concentration with a 1.5 safety factor. Excavation of the trench will result in a blended stockpile. The blended stockpile should then all be placed into the trench during backfilling. 2. The excavated soil stockpile shall be uniformly covered with the neutralising agent (aglime or lime sands) immediately upon excavation from the trench. The thickness of the neutralising layer shall be based on the laboratory defined %S concentration with a 1.5 safety factor. The stockpile and covering layer should then all be placed into the trench during backfilling to result in a blended backfill.	During construction	Construction Contractor
	Clays excavated from within the MEDIUM and HIGH risk areas that exhibit a sulphide content >0.03%S and <0.1%S shall not require active treatment or management unless visual signs of sulphide oxidation arise during the stockpiling period.	During construction	Construction Contractor
Dewatering and water disposal	Dewatering and water disposal in areas of identified Acid Sulphate Soil shall be carried out in accordance with the Dewatering and Water Disposal Management Protocol (Section 4.4).	During construction	Construction Contractor
Record keeping	Records shall be kept of the source, type and volume of neutralising agent supplied for the project. The Effective Neutralising Value (ENV) of the neutralising agent will be provided by the supplier and kept on record.	During construction	Construction Contractor
	Records shall be kept of daily excavation lengths, neutralising rates and areas, and stockpile inspections. Photographs shall be taken to demonstrate protocols have been followed.	During construction	Construction Contractor

NOTE: The above management actions only apply to acid sulphate soils that occur below the natural watertable.

4.5.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Sulphide oxidation	Daily.	Stockpiles.	To confirm that sulphide oxidation does not occur as a result of stockpiling activities.	Construction Contractor
pHF and pHFOX	1 sample per 200 m^3 of soil excavated.	MED-LOW risk areas.	To confirm that acid sulphate soils are not present.	Construction Contractor
Trench backfilling capability	Daily while any trench is open in HIGH, MEDIUM, and MED-LOW acid sulphate soil risk area	On Loops with identified acid sulphate risk	To demonstrate capability to backfill trench within 48 hours of opening, if required	Construction Contractor
Source, type, ENV and volume of neutralising agent used	On application to trench	On Loops with identified acid sulphate risk	To demonstrate compliance with required treatment rates	Construction Contractor
Daily excavation lengths, neutralising rates and areas, and stockpile inspections. Photographs shall be taken to demonstrate protocols have been followed.	Daily when trenches open in acid sulphate soil risk areas	On Loops with identified acid sulphate risk	To demonstrate compliance with required treatment rates and protocol	Construction Contractor

4.5.6 Contingency actions

Trigger	Action	Responsibility
Trench remains open for longer than 48 hours	Investigate cause of trenching delay.	Construction Contractor
	Stockpiles shall be tested daily for pH_F at a rate of 1 sample per 200 m^3 of stockpiled soil. If pH_F 4 then the stockpile shall be covered with a guard layer of neutralising material.	Construction Contractor
Unexpected soils	If any soil types are encountered in the MEDIUM or HIGH risk areas during the excavation works that are not representative of the material sampled during the acid sulphate soil investigation, these soils shall be treated as acid generating and neutralised by layering with a neutralising material (aglime or lime sands) at 0.5 m intervals upon re-emplacement in the trench. The thickness of the neutralising layers shall be 0.05 m/layer.	Construction Contractor
Unquantified Neutralising Agent	If the ENV of the neutralising agent is not provided by the supplier, 1 sample for every 500 m^3 of neutralising agent shall be collected and analysed for Calcium Carbonate Equivalence by a NATA accredited laboratory to determine the ENV of the material.	Construction Contractor

4.5.7 Recording

Records shall be kept of all areas where active acid sulphate soil management occurs. Records to be kept shall include (where practicable): date, location (KP), UTM, datum (WGS84 or similar), volumes of neutralising agent used, volume of soil treated, soil type and photographic evidence of the soil management process to confirm adherence to the protocol. Results of any field testing and stockpile inspections undertaken shall be recorded.

4.6 Fauna Interaction Protocol

4.6.1 Background and environmental risks

Construction of the project requires clearing and grading, excavation, pipe-laying, backfilling, hydrotesting, rehabilitation and commissioning activities to be undertaken adjacent to the existing pipeline. There will be a requirement for construction camps, stockpile sites, small worksites, access roads and water storage facilities (turkey nests) associated with these works. Looping construction could potentially affect indigenous and feral fauna in a number of ways, including:

- death/injury of fauna from impact with vehicles
- spread of weeds and feral fauna along cleared line
- fragmentation of habitat (temporary)
- loss of habitat (generally temporary, however, the necessary removal of large habitat trees may result in some permanent habitat loss)
- increase in indigenous and feral fauna due to provision of water in "turkey nests" (temporary)
- entrapment in trenches excavated to receive the pipeline with potential for stress, and mortality through exposure or increased predation (temporary)
- disturbance of fauna in nearby areas from light, noise and even by personnel feeding selected species (temporary).

Rare or endangered fauna species are protected by the *Wildlife Conservation Act 1950* (Wildlife Act), some of which are also listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). A cleared access track near the pipeline will be retained for maintenance purposes. The existing track may be relocated within the pipeline easement to cater for access to the multiple pipelines within the easement.

4.6.2 Purpose and scope of protocol

The purpose of this protocol is to provide for management of interactions between people/machinery and fauna so that the above effects on fauna are minimised, to achieve the environmental objectives for the fauna factor (Section 4.6.3).

The fauna inspection and clearing protocols associated with the trenches, including time limits on trench openings, do not apply to "bell holes[10]" left open where pipe strings are joined, at valve pit installation points, etc., which would be managed in the same fashion as any point excavations associated with maintenance of the existing pipeline facility. For safety purposes, bell holes are required to be constructed with ramps to enable construction personnel to safely egress. These ramps also prevent entrapment of fauna.

For the purposes of this protocol:

- "trench" refers to open excavation deeper than 50 cm below the working surface of the CROW, intended to contain the gas pipeline or containing the gas pipeline
- in the case of watercourse crossings, the "trench" is the narrow excavation at the base of the excavated CROW (the working platform), whose sole purpose is to contain the laid pipe—it does not include the excavation below the natural surface to create the working platform in the watercourse area
- "fauna" refers to native vertebrate fauna and feral fauna refers to predatory species, such as foxes, cats, etc.

[10] Bell holes are constructed where pipe strings are joined, at mainline valves, at major bends, at inlets for hydrotesting, at facilities crossings, and where loop ends are tied into the existing pipeline or compressor station. Bell holes are usually benched and have ramped access points that enable personnel to enter the trench but also provide points for entrapped wildlife to leave the trench. Bell holes will be required, on average, every 500 m along the pipeline.

- "habitat trees" refers to trees with a trunk of diameter greater than 30 cm at breast height, irrespective of evidence of use or potential for use by fauna.

4.6.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Direct fauna impacts	To minimise the direct impacts on fauna through impacts with vehicles, entrapment in construction works, or extraordinary exposure to predators.	*Wildlife Conservation Act 1950* and associated regulations. DBP Fauna Management Procedure.	Pipeline trenches to be not be open for longer than prescribed in this protocol. Achievement of fauna inspection and clearing requirements. Adherence to injured animal protocol. Vehicle speeds limited on unformed access tracks and construction worksite.
Fauna habitat	To minimise the temporary and permanent reduction or fragmentation of existing fauna habitat.	Conformance with Flora and Vegetation Management Protocol (Section 4.2). DBP Fauna Management Procedure.	No habitat trees, or parts of habitat trees, other than those in the direct line of the proposed pipeline or that materially interfere with construction of the pipeline to be removed. No vegetation clearing to be undertaken outside approved areas.

4.6.4 Management actions

Issue	Action	Timing	Responsibility
Fauna surveys	Pre-construction fauna surveys shall be undertaken in areas where significant species are considered likely to occur, and specific management plans developed for handling each species. No clear and grade operations shall commence on each loop until the pre–construction field survey is complete for that loop, preservation markings on vegetation to be retained (e.g. habitat trees, Threatened Flora) are affixed and the Environmental Line List (ELL) updated with the results of the survey.	Prior to construction	Construction Contractor
Inductions	All field staff are to be made familiar with the Fauna Interaction Protocol.	During induction	DSC and Construction Contractor
Vehicle impact	Clearing shall not occur outside authorised clearing areas.	At all times	Construction Contractor
	Vehicle speeds shall not exceed 40 km/h in the CROW[11] or walking pace in active construction areas.	At all times	All drivers
	Vehicle drivers and construction staff shall arrange translocation (by licensed handlers) of fauna observed in construction area.	As required	Vehicle drivers and construction staff
Loss of habitat	Habitat trees within or immediately adjacent to any construction areas shall be marked by the fauna handling team and the relevant Regional Office of DEC advised. Marked trees shall not be felled except where they materially interfere with construction of the pipeline, or are a safety concern.	Prior to clearing and grading	Construction Contractor
	Fauna handlers shall inspect habitat trees for fauna immediately prior to felling and shall be present during felling to translocate fauna as required.	During clearing and grading	Construction Contractor

[11] The CROW is the area that has been or is being cleared for active works for the construction of the pipeline. It is typically a 30 m wide easement with a reduced width in specified areas to minimise environmental impacts.

Issue	Action	Timing	Responsibility
	Any habitat trees with nesting hollows that are felled are to have the hollow removed and attached to a suitable nearby tree, if available.	Prior to clearing and grading	Construction Contractor
	Prune habitat trees that overhang construction areas, rather than remove them, where practical. Pruning is to by undertaken with the 'three cut method' to prevent bark stripping (see Figure 4-1).	As required	Construction Contractor
Entrapment in pipeline	Pipes shall be inspected prior to welding and observed fauna removed by fauna handlers.	Prior to welding	Construction Contractor
	Welded pipeline sections shall be capped at end of shifts to prevent fauna entry.	Immediately following welding and weld testing	Construction Contractor
Entrapment in trenches	Where practicable to do so, open trenching shall be avoided between the months of November to March to minimise fauna stress or deaths during the summer months.	November to March	Construction Contractor
	No part of the trench, other than "bell holes", shall remain open for more than 14 days unless such an exceedance can be demonstrated as being unavoidable under the prevailing circumstances and approval is obtained from the CEO of the DMP[12 13].	During construction	Construction Contractor
	In environmentally sensitive areas, no part of the trench shall remain open for more than 7 days unless such an exceedance can be demonstrated as being unavoidable under the prevailing circumstances and approval is obtained from the CEO of the DMP[14].	During construction	Construction Contractor
	Fauna shelters/refuges (eg: cardboard boxes, hessian bags, commercial egg cartons) shall be placed in open trenches at intervals not exceeding 50 m.	Immediately following trenching	Construction Contractor
	Trench plugs and fauna exit ramps shall be installed at both ends of trenches at intervals not exceeding 1200 m and ramp slopes are not to exceed 45° unless alternative arrangements are agreed to with DMP in consultation with DEC.	During trench excavation	Construction Contractor
	Open trenches shall be inspected and cleared by fauna handling teams by 4.5 hours after sunrise. Trench clearing shall be managed in accordance with Section 4.6.10.	Daily when trenches are open April to October	Construction Contractor
	If open trenching is undertaken during November to March, trenches shall be inspected and cleared by 3 hours after sunrise, except if the maximum daily temperature is forecast to exceed 35°C, then trenches shall be inspected and cleared by 2.5 hours after sunrise.	November to March	Construction Contractor
	Trench inspections procedures shall ensure inspection of the entire base of the trench, with attention to evidence of burrowing reptiles, and inspection of all shelters/refuges.	All inspections	Construction Contractor

[12] Routine construction breaks in areas other than conservation areas are considered as being demonstrably unavoidable.

[13] CEO Approval has been obtained for trenches to remain open for up to 21 days in areas where rock is encountered, such that trenching is slowed down. See Section 4.6.5 for details of approval and associated requirements.

[14] CEO Approval has been obtained for trenches to remain open for up to 10 days in environmentally sensitive areas where rock is encountered, such that trenching is slowed down, and for up to 14 days in the Melaleuca Park and Ellenbrook Landscape Conservation Areas. See Section 4.6.5 for details of approval and associated requirements.

Issue	Action	Timing	Responsibility
	Open trench lengths shall not exceed lengths capable of being practically inspected and cleared in accordance with this protocol by the available fauna teams at any time.	During construction	Construction Contractor
	The occurrence of water in trenches shall be managed by taking action to avoid the development of any individual water bodies longer than 100 m in length[15].	While trench open	Construction Contractor
	Where a trench contains water and is not dewatered, the trench shall not remain open for longer than 7 days.	While trench open	Construction Contractor
	Open trench shall be inspected by the construction contractor immediately prior to lowering in and any entrapped fauna cleared by a fauna handler before lowering in can be completed.	Prior to lowering in	Construction Contractor
	Open trench shall be inspected by construction contractor half an hour prior to backfilling and any entrapped fauna cleared by a fauna handler before backfilling can be completed.	Prior to backfilling	Construction Contractor
Spread of weeds	The Weed Management Protocol (Section 4.3) shall be implemented.	As required	Construction Contractor
Fauna access to turkey nests	All turkey nests and dams shall be fenced.	As required	Construction Contractor
Weekly reports	Weekly reports on fauna interactions shall be provided to the Environmental Management Branch and the relevant Regional office of DEC no later than one week after the period covered by the report.	Weekly	DSC
Adverse weather	Daily checks of Bureau of Meteorology flood forecasts shall be undertaken. In the event of flooding being forecast for areas with open trench, the contingency action (Section 4.6.7) shall be implemented.	Daily	Construction Contractor
Other	Rubbish shall be managed in accordance with the Waste Management Protocol (Section 4.12).	At all times	Construction Contractor
	The feeding of animals, hunting, or keeping of firearms or pets on the construction site and camps is prohibited.	At all times	Construction Contractor

4.6.5 Approvals for extended trench open times

In areas where blasting or other rock breaking measures are required to excavate the trench, trenches may remain open for a maximum of 21 days. Where the extended times are to be implemented, the following management actions are required:

1. DMP is to be informed via DSC on each occasion the extended time is to be implemented, including an explanation of the reasons for that occurrence.
2. Fauna inspections are to be conducted twice daily, with the first inspections to be undertaken in accordance with the requirements set out in Section 4.6.4. The second inspection and clearing is to be undertaken daily between the fours of 3:00 pm and 6:00 pm.
3. The requirements for the second inspection and clearing are to be reviewed after ten days of implementation in consultation with DMP and may be consequently modified with the approval of the DMP.

4.6.6 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Trench open lengths and locations (trench start and end locations by KP points)	Daily	All open trenches	To demonstrate compliance with time limits on open trenches	Construction Contractor
Trench plug locations (by KP point)	Daily	All open trenches	To demonstrate compliance with trench plug requirements	Construction Contractor

[15] Use of soil "islands" or floating refuges would be an acceptable method of managing water body lengths in situations where dewatering of the trench is not to be undertaken.

Parameter	Frequency	Location	Purpose	Responsibility
Bell hole locations	Daily	All open trenches	To demonstrate compliance with time limits on open trenches where extended by crew breaks	Construction Contractor
Areas of rock excavation (by KP point)	Daily	All open trenches	To demonstrate compliance with time limits on open trenches in rock areas	Construction Contractor
Break periods for pipe laying and backfilling crews	Daily	All open trenches	To demonstrate compliance with time limits on open trenches where extended by crew breaks	Construction Contractor
Vehicle interactions	As occurs	All access and construction roads	To record incidences of vehicular contact with fauna	All drivers
Habitat tree removal	During clear and grade	All access and construction roads	To record removal of fauna habitat	Construction Contractor
Fauna entrapment incidents and actions taken	Daily	Pipes prior to welding Open trenches Constructed water sources	To record fauna entrapment and clearing incidents	Construction Contractor
Reports on fauna inspections, interactions, mortalities, opportunistic sightings and all actions taken	Weekly	All	To enable DSC to provide interaction occurrences to DEC	Construction Contractor
Performance monitoring reports on fauna management	Report to be made publicly available on completion	All	To inform public	Construction Contractor
Fauna handler licence register	Maintained up to date	All	To record staff authorised to perform duties as an experienced fauna handler (see Section 4.6.8)	Construction Contractor
Fauna handler training register	Maintained up to date	All	To record staff authorised to perform duties as an assistant fauna handler (see Section 4.6.8)	Construction Contractor
Pre-pipe laying and backfilling fauna inspection register	Maintained up to date during pipe laying and backfilling operations	During pipe laying and backfilling operations	To record inspections of trench for entrapped fauna immediately prior to pipe-laying and/or backfilling	Construction Contractor
Digital photographs[16] of fauna teams with required fauna handling equipment (hoop and bag)	Weekly during fauna inspection and clearing activities	On each loop during periods that trenches are open	To provide evidence of use of required equipment for audit purposes	Construction Contractor

4.6.7 Contingency actions

Trigger	Action	Responsibility
Weekly fauna mortality rate exceeds 5% for two consecutive weeks on any loop where the weekly fauna interaction rate exceeds 25/week#.	Advise DMP as soon as practically possible in order to determine a possible cause and implement appropriate and timely contingency measures.	DSC
Request to any query from DEC regarding fauna interaction or mortality rates.	Respond to DEC query.	DSC

[16] Original digital photographs should be retained to ensure files contain details of photograph (date and time taken, etc.).

Trigger	Action	Responsibility
Death of any *Wildlife Conservation Act 1950* or EPBC Act listed species	Advise DEC regional staff and DSEWPaC as soon as practically possible.	DSC
Injured animals	Injured animals shall be reported to the fauna team in the first instance and assessed by an experienced zoologist to determine whether translocation, transfer to wildlife carer or euthanasia is the required action, and that action shall be implemented (see Sections 4.6.10 and 4.6.11). If the injured fauna is of conservation significance, the regional DEC office shall be advised.	All drivers

4.6.8 Fauna teams

Daily trench inspections and fauna handling shall only be undertaken by teams of a minimum of two people. At least one person in each team must be able to demonstrate experience in:

- fauna identification, capture and handling (including venomous snakes)
- identification of tracks, scats, burrows and nests of conservation significant species (i.e. mulgara or malleefowl)
- fauna vouchering
- assessing injured fauna for suitability for release, rehabilitation or euthanasia
- familiarity with the ecology of the species that may be encountered in order to be able to appropriately translocation fauna encountered
- performing euthanasia
- interacting with venomous snakes.

The means of demonstrating the required experience shall be through the holding of a Section 15 *Licence to take fauna for public purposes*, under the Wildlife Conservation Regulations 1950, issued specifically for the purposes of fauna capture and release on the project, and based on having the required experience as above.

Basic fauna handling training is to be provided to all members of fauna handling teams who do not possess the above experience. This training is to be provided before team members are employed in fauna inspection or clearing activities, in accordance with a DEC approved training package. Experienced fauna handlers are to conduct training, unless otherwise authorised by DSC.

An experienced zoologist or veterinarian shall be available for consultation on fauna handling matters as required. The zoologist need not be located on site.

4.6.9 Fauna handling and inspections

Fauna handlers shall be equipped with a hoop-bag for capturing animals, a snake jigger, and means of inspecting fauna shelters without the need to enter the trench.

Trench inspections and clearing could, on average, be expected to progress at walking pace (≈3 km/hr). Based on the 4.5-hour clearing period in the northern sections, trench lengths of about 13.5 km can be managed per fauna team. In the southern sections, trench lengths of about 15 km/team can be managed during the 5-hour clearing period. Based on this, limitations on the lengths of trench permitted to be open at any one time can be related directly to the number of fauna teams available.

Inspections, other than those associated with the required daily trench inspections, may be carried out by any personnel employed on the site. Fauna handling shall only be undertaken by an experienced member of any fauna team, or under the direct supervision of an experienced fauna handler.

Pre-pipe laying and backfilling inspections may be carried out by any person, however, any fauna found in the trench are to be immediately reported to the fauna handling team and removal arranged before pipe laying or backfilling is undertaken at that location.

4.6.10 Translocation and release

Where animals are to be captured for immediate translocation, this shall be done in a manner that will minimise stress and risk of injury to both the animal and the handler. Translocation shall be immediate to suitable habitat at a suitable distance from the disturbance, on advice from an experienced zoologist.

There may be a trade-off between distance from disturbance (and, therefore, chance of re-encounter) and habitat or species requirements (and, therefore, species' survival). For small species, species with small home ranges, or species that have reasonably specific habitat requirements, this may mean that the optimum release point is near the point of disturbance. For example, species from rocky habitats need to be released in rocky habitats even if these lie only 20–30 m from the pipeline route.

For large species, species with broad home ranges, or species that have broad/general habitat requirements, the release point could be over 100 m from the pipeline route. In uniform habitat, practicality may determine the appropriate release distance. A suitably experienced zoologist with a sound working knowledge of fauna ecology and requirements shall be responsible for the management of this process. They shall also be responsible for deciding if an injured animal should be released or dealt with in another way (see below).

4.6.11 Injured animals

In some instances, injured animals may be found. If the injuries to an animal are so serious that it is decided that the animal will not survive if released, transfer to a wildlife carer may be appropriate in some cases. The same situation would apply with nesting birds and orphaned joeys. The alternative to caring for such fauna would be euthanasia (see below).

Transfer to a wildlife carer

Transfer of injured or orphaned fauna to a wildlife carer will be dependent upon a number of factors, including:

1. **Location.** In remote areas, there is unlikely to be access to a wildlife carer. Where there is no ready access to a wildlife carer, euthanasia may be the only option (see below). There may be ready access to a wildlife carer in other areas.
3. **Species.** Decisions to rehabilitate or not rehabilitate wildlife shall be made by a suitably experienced/trained zoologist, in consultation with DEC in the case of rare species.
4. **Introduced species.** As a policy, injured introduced species should be euthanased (see below).

A directory of recognised DEC wildlife carers shall be distributed to relevant project construction personnel.

Euthanasia

If an experienced zoologist/veterinarian advises that rehabilitation is not an option for an injured or orphaned animal because it is an introduced species or because access to a carer is not possible or justified, then euthanasia is the only option. Injured animals shall not be left to suffer.

Transferring injured animals to a veterinarian is unlikely to be a viable option in most cases, unless the animal is located near a veterinary clinic, as an animal is likely to suffer during such transportation.

Euthanasia shall be carried out by a suitably qualified person and shall be consistent with animal welfare legislation and DEC guidelines (e.g. Chapman *et al*. 2005). All fauna handlers shall have access to this document.

In most cases, dead animals, either found during operations or euthanased, shall be removed from the immediate vicinity of activity to prevent carrion feeding species being attracted to areas where they may, in turn, be injured. Carcases shall be incinerated or buried.

4.6.12 Recording

Records shall be kept of all animals encountered during fauna management operations. Opportunistic listings of fauna (native and introduced) shall also be kept, including bird lists. Detailed records shall be made of animals handled. Records to be kept shall include (where practicable): date, location (KP), UTM, datum (WGS84 or similar), species, vegetation and landform, and any notes such as the form of encounter and details regarding release. Photographs shall be taken of any unidentifiable species.

Weekly reports on fauna interactions, together with any information on opportunistic sightings shall be forwarded to the Environmental Management Branch of DEC within one month of completion of the project. A performance monitoring reports on fauna management shall be produced and made publicly available via the DBP website. A final summary report shall also be forwarded to the relevant regulatory agencies on completion of the project.

4.6.13 EPBC Act listed threatened and/or migratory species

The actions described in this protocol are considered adequate to cover the management of Threatened and/or Migratory Fauna species listed under the EPBC Act; no additional species-specific management is considered necessary.

4.7 Watercourse Crossing Management Protocol

4.7.1 Background and environmental risks

The project crosses the Ashburton River at two locations along the alignment. Crossing the watercourse may result in disturbance of the beds and banks, increasing the risk of erosion and disturbance of riparian vegetation, which may result in a reduction of downstream water quality.

Two methods are proposed to be undertaken to cross watercourses, with the methods adopted at each site to be based on the geotechnical characteristics of the site, the environmental significance of the watercourse, the potential for environmental impacts as a result of the activity and expected water flow during construction. The alternative methods proposed are:

- open trenching
- horizontal directional drilling (HDD).

The environmental impacts associated with both open trenching and HDD are likely to be temporary, although trenching is likely to be more disruptive to the bed and banks of the watercourse. HDD cannot be undertaken where the geotechnical characteristics of the site may result in the possibility of drilling fluid escaping through the bed of the watercourse. The method to be adopted for the individual sites will be determined on a site-specific basis. Due to the environmental risk associated with both open trenching and HDD, specific management is required to minimise the potential for environmental impacts to result from the construction activities.

The CROW for open trenching through watercourses will be substantially wider than in other areas, to facilitate space for the excavation necessary to establish a working platform close to the pipeline trench invert, and to provide areas to store excavated material.

4.7.2 Purpose and scope of protocol

The purpose of this protocol is to provide for the management and protection of watercourses, water quality and dependent ecosystems, including minimisation of disturbance of riparian vegetation. The protocol will apply where outlined in the Environmental Line List (ELL).

4.7.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Disturbance to watercourses	Minimise and manage disturbance of watercourses.	*Rights in Water and Irrigation Act* 1914 permit conditions.	Compliance with *Rights in Water and Irrigation Act* 1914 permit conditions.
Contamination of watercourses	Prevent contamination of watercourses from construction activities.	*Rights in Water and Irrigation Act* 1914 permit conditions.	Compliance with *Rights in Water and Irrigation Act* 1914 permit conditions. No direct discharge of dewatering water to watercourses. No waste discharges to watercourses. No significant (in excess of 80 litres) spills or leaks of hydrocarbons during construction and rehabilitation operations outside of areas designated for maintenance, refuelling or storage.

4.7.4 Management actions

Issue	Action	Timing	Responsibility
General requirements	The induction program shall involve a watercourse management component to ensure all personnel are aware of the requirements for the protection of watercourses.	Induction	Construction Contractor
	Watercourse crossings shall be scheduled during dry conditions or low flow periods wherever practicable.	As required	Construction Contractor
	Erosion control measures shall be installed as required to protect sites near the pipeline easement.	Prior to construction	Construction Contractor
	The procedures set out in the detailed watercourse crossing rehabilitation and wet crossing plan presented in Appendix 6 shall be implemented. The procedures are to ensure that there is no adverse effect on the flow available to downstream users in terms of either quantity or quality. The procedures set out the methods to be employed, including flow bypass methods, i.e.: trenches, pumps etc.	Prior to construction commencing	Construction Contractor
Survey, fencing and service location	The total area of proposed disturbance associated with the watercourse crossing shall be marked out with survey pegs and flagging so as to delineate the areas of construction activity and access.	Prior to ground disturbing activities	Construction Contractor
	Watercourses and riparian zones shall only be accessed along the CROW.	At all times	Construction Contractor
	A buffer zone extending 200 m from each bank of all watercourses along the CROW shall be flagged and signposted and recorded in the ELL.	Prior to construction activities	Construction Contractor
	Habitat trees in the riparian zone shall be marked and managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	Prior to and during ground disturbing activities	Construction Contractor
Fuel storage, handling and refuelling	Fuel storage and handling shall be consistent with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11). No storage of fuel or hydrocarbons shall occur within 200 m of a watercourse.	At all times	Construction Contractor
	Refuelling of any plant within 200 m of a watercourse is to be undertaken in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times	Construction Contractor
Soil management	Soil management shall be in accordance with the Soil Management Protocol (Section 4.13).	As required	Construction Contractor
	Topsoil shall be cleared from any area within the watercourse buffer zone to be subject to disturbance, and stockpiled separately from subsoil to avoid soil profile inversion on backfilling.	As required	Construction Contractor
Vegetation	Vegetation management shall be in accordance with the Flora and Vegetation Management Protocol (Section 4.2).	As required	Construction Contractor
	Cleared and pruned vegetation shall be stockpiled on-site for later use in bank stabilisation and rehabilitation.	As required	Construction Contractor
	Cleared and pruned vegetation shall be placed and secured over the disturbed areas of the mid-stream banks to stabilise and minimise flood erosion, and to encourage re-establishment of mid-stream vegetation.	As required	Construction Contractor
Drilling	HDD drill site, entry and exit points shall be located away from watercourse banks and riparian areas, as far as practicable.	As required	Construction Contractor
	Prior to commencement of works HDD equipment shall be inspected to ensure it is in good working order.	Daily	Construction Contractor
	The drilling site shall be completely contained within an appropriate earthen bund. Topsoil must not be used in the construction of the bund.	At all times	Construction Contractor
	Drill entry and exit points shall be monitored during drilling for potential fracturing out of drilling mud.	At all times	Construction Contractor
	Only water based drilling fluids shall be used and shall be contained in mud tanks or pits and de-sanded and recirculated during drilling.	At all times	Construction Contractor
	Drilling mud and cuttings shall be disposed of consistent with the Waste Management Protocol (Section 4.12).	At all times	Construction Contractor

Issue	Action	Timing	Responsibility
Trenching and excavation	When surface water is present, diversion berms or drains shall be installed to divert water away from the construction area.	As required	Construction Contractor
Clean-up and rehabilitation	Rehabilitation of watercourses shall be undertaken as set out in the watercourse crossing rehabilitation and wet crossing plan presented in Appendix 6.	As required	Construction Contractor
	Pre–construction equivalent stability, channel profile and bed composition shall be achieved wherever practicable.	At all times	Construction Contractor
	The banks shall be reinstated in the same manner as the original pipeline construction using hessian bags filled with a combination of sand and cement, unless otherwise approved by DSC and the action is consistent with the watercourse crossing rehabilitation and wet crossing plan presented in Appendix 6.	As required	Construction Contractor
	Backfill crown shall be graded and shaped as closely as practicable to pre-existing contours and flow patterns of riverbed and riparian zone.	At all times	Construction Contractor

4.7.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Photographic evidence and GPS coordinates of on-ground delineation of proposed disturbance areas within and adjacent to watercourses	Prior to ground disturbance on relevant loop	All areas of proposed disturbance of native vegetation associated with watercourses	To record incidences of clearing of vegetation and/or flora outside approved construction areas	Construction Contractor
Rehabilitation effectiveness	After first significant flow event following rehabilitation	All major river crossings	To confirm effectiveness of rehabilitation	DSC

4.7.6 Contingency actions

Trigger	Action	Responsibility
Erosion/sedimentation	Initiate control measures to prevent further erosion/sedimentation.	Construction Contractor
	Undertake remedial action.	Construction Contractor
	Investigate and update protocol as required.	Construction Contractor
Complaints	Should DSC or DoW receive a complaint of low flow or silt problems etc., the company will audit /review their on the ground practices to ensure they are not contributing or causing the problem and then report their findings to the DoW within 7 days of receiving the complaint. If the audit identified they were causing the problem they would also advise the DoW on what action they have taken to rectify the problem and prevent it happening again.	DSC

4.8 Fire Management Protocol

4.8.1 Background and environmental risks

Construction activities associated with the project (i.e. welding) and the operation of equipment (generators) may increase the risk of fire, particularly within high fire danger areas. Fires have the potential to result in damage to property and equipment, and cause injury or loss of life. Further, fire within bushland and areas of conservation value can detrimentally affect the conservation significance of these areas.

As such, the fire risk associated with construction activities is required to be managed, to minimise the potential for fires and contingency actions implemented should a fire occur.

4.8.2 Purpose and scope of protocol

The purpose of this protocol is to provide for fire management during the construction activities of the project, to achieve the environmental objectives outlined below.

4.8.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Prevent fires	To prevent fires occurring as a result of construction activities.	*Bush Fires Act 1954.* DBP Bushfire Management Procedure.	Compliance with *Bush Fires Act 1954.* No pipeline construction related fires.

4.8.4 Management actions

Issue	Action	Timing	Responsibility
Induction	All construction staff shall be trained in the use of fire fighting equipment, and shall be familiar with the equipment located within their specific work areas and campsites.	Prior to commencing work on site	Construction Contractor
General	Campsites in any vegetated areas shall provide space for firebreaks on all sides of the site that are contiguous with such vegetation. The firebreaks need not be cleared unless there is clear and immediate risk of fire, but should be delineated as part of the campsite, prior to any clearing for the facility.	Prior to and during construction	Construction Contractor
	Open fires (including BBQs, billy fires, brush burning and rubbish burning) are banned.	During construction	Construction Contractor
	Fire prevention and response equipment shall be made available and checked prior to construction in any area.	Prior to construction	Construction Contractor
	All machinery shall be maintained and operated to comply with relevant fire safety standards. Defective machinery shall be shut down until the defect is rectified and the machine made safe for operations.	At all times	Construction Contractor
	All personnel shall be inducted on the smoking policy and the dangers of inappropriate cigarette disposal with reiteration of duty of care to be stated at toolbox meetings.	Prior to construction and daily	Construction Contractor
	No burning of vegetation shall occur.	At all times	Construction Contractor
Consultation	Regular liaison shall be initiated and maintained with local emergency service organisations and stakeholders, including advising them of the nature and schedule of construction activities.	As required	Construction Contractor
Fire weather monitoring	Fire weather warnings will be monitored daily through local government sources and other relevant authorities (DEC, DAF).	Daily	Construction Contractor
	Information regarding fire warnings shall be provided to construction crews during toolbox meetings.	As required	Construction Contractor
Permits	Work necessary to be undertaken that is in contravention of fire bans shall only be managed in accordance with permits from DEC.	As required	Construction Contractor

Issue	Action	Timing	Responsibility
Fuel storage and re-fuelling	Fuel storage and re-fuelling shall be managed in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times	Construction Contractor
Fire fighting equipment	All vehicles shall be fitted with dry chemical extinguishers (light vehicles with 1 kg units, trucks etc 9 kg units). All extinguishers shall be tagged by an approved inspector prior to mobilisation.	Prior to and during construction	Construction Contractor
	Fast attack vehicles shall be provided and used in accordance with FESA requirements.	Prior to and during construction	Construction Contractor
	Access to pump, hose and associated fire fighting equipment shall be available at all times.	At all times	Construction Contractor
	A water cart (approx 4000-5000 litre capacity) with fire fighting capacity shall be available for immediate use within each pipeline spread.	During construction	Construction Contractor
	Service trucks shall be fitted with both a 9 kg foam extinguisher and a 9 kg chemical extinguisher.	During construction	Construction Contractor
Clear and grade	Cleared vegetation shall be stockpiled clear of any hot work activities.	During clear and grade	Construction Contractor
Welding and weld testing	All welding and grinding shall be undertaken with facilities in place to prevent any sparks contacting any flammable material.	During welding operations	Construction Contractor
	The welding rig shall be fitted with a 900 L capacity tank and spray packs for welding crews for fire fighting purposes.	Prior to construction	Construction Contractor
	Welding assistants shall be alert for any evidence of spot fires.	During welding operations	Construction Contractor
Waste disposal	Disposal of refuse, including cigarettes, shall be undertaken to minimise potential fire risk in accordance with the Waste Management Protocol (Section 4.12).	During construction	Construction Contractor
Fire reporting	Any fires within the CROW or in adjoining lands shall be reported to the Site Supervisor and appropriate actions taken (site evacuation, mobilisation of fire fighting teams etc.). All incidents will be recorded.	During construction	Construction Contractor

4.8.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Fire fighting training	All welding crews, plant operators and supervisors	Active construction areas	To ensure adequate training of personnel likely to be exposed to fires	Construction Contractor
Occurrence of fires as a result of construction activities	As occurs	Active construction areas	To determine if management measures are appropriate to prevent fires occurring as a result of construction activities	All employees
Inspection	Opportunistic	Active construction areas	To determine if management measures are appropriate to prevent fires occurring as a result of construction activities	Construction Contractor

4.8.6 Contingency actions

Trigger	Action	Responsibility
Localised (small) fire incident	Extinguish fire. Determine the activity that caused the fire incident. Review the Fire Management Protocol and implement additional management measures as necessary to prevent another fire occurring.	Construction Contractor
Significant fire incident	Extinguish fire. Determine the activity that caused the fire incident. Review the Fire Management Protocol and implement additional management measures as necessary to prevent another fire occurring. Advise DMP and other stakeholders such as landholders, DEC and DAF. Undertake rehabilitation measures in accordance with the Rehabilitation Protocol (Section 4.15) in consultation with the landholder(s) and other stakeholders.	Construction Contractor

4.8.7 Fire equipment training

As part of the induction package, all project personnel shall be instructed on prevention, safety and response practices for fire management as a component of the environmental induction process. Specific training on the use of relevant fire fighting equipment is to be provided to all welding crews, plant operators and supervisors.

4.8.8 Communications

DEC district (regional) offices shall be advised of activities prior to construction occurring in areas of conservation value. This will include an assessment of potential fire risks and management measures implemented to minimise the dangers.

In the event of a fire ban, construction activities shall cease unless a permit to work is obtained. In areas of conservation value, the process to obtain a permit to work will also require seeking advice from DEC district offices.

4.9 Dust Management Protocol

4.9.1 Background and environmental risks

Construction activities; such as clearing and grading, trenching, backfill, rehabilitation, and general vehicle movement along the easement are likely to increase the risk of atmospheric dust emissions. These emissions may result in off-site environmental impacts and public concern, particularly when activities are undertaken close to residences.

The risk of activities resulting in off-site dust emissions is generally dependant on:

- the frequency at which a dust generating activity takes place
- meteorological conditions, such as wind speed
- composition of dust, including particle size distribution, particle density and moisture content
- the condition of the source.

The majority of the airborne particles associated with dust emissions from construction activities are likely to be larger than PM_{10} and are associated with nuisance rather than public health problems. Further, the larger particles tend to settle back to the ground within a short range (<300 m) from the source, reducing the potential impact of the operations.

The impact of dust on fauna is expected to be insignificant as individuals are unlikely to be near the construction site when dust-generating activities are being conducted. Further, due to the short-term nature of the construction activities, the risk of dust smothering vegetation is not expected to be significant.

To ensure environmental impacts are minimised, and to provide for appropriate working conditions, dust generation should be minimised to the greatest extent practical, with specific management required when activities are close to residences and within the Perth Metropolitan region.

4.9.2 Purpose and scope of protocol

The purpose of this protocol is to provide for the management of dust emissions to achieve the environmental objectives outlined in Section 4.9.3. Contingency actions are provided and should be implemented where existing management measures are determined to be inadequate in being able to meet the environmental objectives.

4.9.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Landholders	To minimise the temporary impact of dust emissions from construction activities, machinery and vehicles on landholders.	Environmental Protection Regulations 1987. Environmental Protection (Abrasive Blasting) Regulations 1998.	Compliance with statutory regulations. No reasonable substantiated complaints. Acceptable ambient dust levels down-wind of the construction site.

4.9.4 Management actions

Activity	Action	Timing	Responsibility
Planning	Dust generating activities shall not be undertaken during unfavourable weather conditions (e.g. high wind speed), unfavourable wind directions relative to sensitive premises.	Daily	Construction Contractor
	Construction shall be planned to minimise the elapsed time between clearing, grading and restoration.	At all times	Construction Contractor
Consultation	Local residents and stakeholders (within 200 m of pipeline CROW) shall be advised of the likely duration, impacts, potential health risks and mitigation measures to be undertaken whilst construction is occurring in their vicinity (consult DEC Guidelines for the Prevention of Dust and Smoke Pollution from Land Development Sites).	At least 48 hrs prior to construction	Construction Contractor
Vehicle movement	Unnecessary movement of vehicles shall be avoided.	At all times	Construction Contractor
	Vehicles shall not operate on areas other than designated roads, access tracks, CROW and associated construction areas, including construction camps.	At all times	Construction Contractor
	Vehicle speed shall be restricted to no more than 40 km/hr in the CROW.	At all times	Construction Contractor
Clearing and grading	Operations shall be monitored to ensure compliance with design requirements.	At all times	Construction Contractor
	The area being cleared, and thus exposed soil surfaces, shall be minimised.	At all times	Construction Contractor
	Stockpiles shall be lower than the average height of surrounding structures, with a maximum height of 3 m.	At all times	Construction Contractor
	Stockpiles shall be below fence heights when within 5 m of residential boundary.	When within 5 m of residential boundary	Construction Contractor
Trenching	Stockpiles shall be lower than the average height of surrounding structures, with a maximum height of 3 m.	At all times	Construction Contractor
	When within 5 m of residential boundary, stockpiles shall be below fence heights.	When within 5 m of residential boundary	Construction Contractor
Pipe Joining	Grit blasting shall be undertaken to comply with the Environmental Protection (Abrasive Blasting) Regulations 1998.	At all times	Construction Contractor
Padding	Where screening is to be undertaken within 200 m of residences, material shall be damp to prevent visible dust crossing the easement boundary.	As required	Construction Contractor
Rehabilitation	Exposed areas shall be rehabilitated and/or stabilised as soon as possible after disturbance, in accordance with the Rehabilitation Management Protocol (Section 4.15).	As required	Construction Contractor
Record keeping	Records shall be kept of all dust monitoring undertaken under Section 4.9.5.	As required	Construction Contractor
Complaints handling	All complaints shall be managed consistent with the Environmental Incident Response Management Protocol (Section 4.1).	As required	Construction Contractor

4.9.5 Monitoring and recording and recording

Parameter	Frequency	Location	Purpose	Responsibility
Dust monitoring	Daily Opportunistic	Construction Area Access tracks	To monitor dust generation and determine if dust suppression is required.	Construction Contractor
Dust from stockpiles	Daily Opportunistic	Construction Area Access tracks	To monitor dust generation and determine if dust suppression is required.	Construction Contractor
Dust on vegetation	Weekly Opportunistic	Construction Area Access tracks	Impacts of dust on vegetation will be visually monitored.	Construction Contractor

4.9.6 Contingency actions

Trigger	Action	Responsibility
Excessive dust generation noted during monitoring or receipt of a reasonable landholder complaint	Investigate cause.	Construction Contractor
	Implement appropriate dust control measures within 48 hrs, including as appropriate: 3. Application of water or stabilisers via water trucks and sprayers to dampen down soil. No run-off should be generated from application. Applications should be frequent enough to provide persistent dust suppression. 4. Cover vehicles with dust emitting loads (except when loading unloading). 5. Use of dust stabilisers, tarps or geo-textile materials to suppress dust generated from stockpiles. These measures shall remain in effect until construction is completed and rehabilitation has taken place.	Construction Contractor and relevant personnel
	Should dust suppression techniques be inadequate, construction activities that generate dust shall be temporarily ceased until a remedy is sought (consultation with relevant agencies may be required).	Construction Contractor

4.9.7 Recording

A record of all dust monitoring shall be maintained with any exceedances reported to DMP within 14 days. The report shall include details of the action implemented to minimise potential reoccurrence of the emissions.

4.9.8 Complaints register

A register of all external complaints received shall be maintained by the Construction Contractor. This register will contain information provided by the complainant regarding their concerns, including:

- name and contact details
- details of the complaint; date, time and description of dust
- outcomes of the investigation
- documentation of the consultation with the complainant describing the mitigation measures that were implemented.

4.10 Noise and Vibration Management Protocol

4.10.1 Background and environmental risks

Noise emissions from the CROW will vary depending on the activity being undertaken (e.g. blasting, clearing and grading), with the duration that noise and vibration impact on any one location limited by the progressive movement of the active construction areas (3 to 6 km per day in the northern loops and 500 m per day in the southern loops).

Construction activities may result in minor increases in traffic noise on roads near the pipeline easement, and may cause localised temporary disruption to fauna in areas adjacent to the easement. However, increased noise emissions will be temporary and as such it is unlikely that the behaviour of fauna will be disrupted in the long term. Campsites should not be located within 2 km of residences.

The assigned noise levels in the Environmental Protection (Noise) Regulations 1997 (Noise Regulations) do not apply to construction activities carried out between 0700 and 1900 hours on any day except Sunday and public holidays provided:

- construction work is carried out in accordance with Section 6 of the Australian Standard 2436-1981 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”
- the equipment used is the quietest reasonably available
- where work is to be undertaken outside these times, the following provisions will be additionally required:
- demonstration to the satisfaction of DMP that it is necessary for the activity to be undertaken during these times
- preparation of a noise management plan to the requirement of the Local Government Authority (LGA), which will include a requirement to notify residents likely to be affected, at least 24 hours prior to commencement of the relevant activity.

Activities outside normal working hours (7 am to 6 pm Monday to Saturday) will be undertaken to ensure emissions comply with the assigned levels provided in the Noise Regulations, unless undertaken in compliance with an approved Noise Management Plan.

Compliance with the assigned levels is based on an approximate distance to residence, calculated from the sound pressure levels provided in AS2436-1981 and using the inverse square rule. Given the temporary nature of the activity, notional criteria consistent with the L_{A1} and L_{Amax} for the specified times have been determined as reasonable targets, and will be used to restrict activities that are unable to comply. Table 4-2 provides an estimate of the distance required to ensure compliance with proposed noise criteria.

Table 4-2: Noise emission characteristics of equipment proposed to be used (taken from AS 2436—1981)

	Expected noise emissions (dBA)	Approx distance to meet noise criteria (m)		
		55 dB (LAmax)	45 dB (LA1) (prior to 9 am Sundays)	50 dB (LA1) (between 9 am and 7 pm Sundays)
Excavators 100 kW to- 200 kW	112	290	948	527
Tractors track 100-200 kW	118	579	1896	1053
Compressors 7 m3/m partly silenced	100	73	240	133
Graders > 100 kW	120	730	2388	1327
Hand tools: grinder breaker	106	145	474	263
Hand tools: chipping hammer	119	655	2142	1190
Trucks 20 T	108	183	600	333
Rock breaker: breaker hydraulic	119	655	2142	1190
Ditching machine: approx	112	290	948	527

	Expected noise emissions (dBA)	Approx distance to meet noise criteria (m)		
		55 dB (LAmax)	45 dB (LA1) (prior to 9 am Sundays)	50 dB (LA1) (between 9 am and 7 pm Sundays)
Padding machine: approx	115	413	1350	750
Dewatering pump	108	183	600	333
Generator	112	290	948	527

Vibration may result from blasting, compaction, excavation and the movement of equipment within the easement, with blasting and compaction likely to result in the greatest potential for impact. Significant levels of vibration have the potential to damage buildings adjacent to the pipeline easement. As with noise, vibration may result in localised temporary disruption to fauna in areas adjacent to the easement disturb fauna, although the increased emissions will be temporary and as such it is unlikely to result in long-term disruption to the behaviour of fauna.

The inappropriate use of explosives and vibration may detrimentally affect existing gas pipeline(s), located adjacent to the proposed trench. Consequently, due to the safety aspect associated with the existing gas pipeline, the use of explosives, and mass of the charges, will be minimised.

Vibration due to compaction of the backfilled trench is unlikely to be a significant issue as the required compaction will be achieved through the driving of rubber wheeled vehicles along the trench in favour of plate and other vibratory-based compactors. Vibration impacts from the movement of heavy vehicles along the easement will be managed through the operating hour limitations proposed to manage noise emissions, as vibration is unlikely to 'travel' as far as noise emissions.

Consequently, specific management is required to ensure compliance with relevant legislation, and to minimise the potential for noise and vibration associated with construction activities affecting residences adjacent to the easement.

4.10.2 Purpose and scope of protocol

The Noise and Vibration Management Protocol provides for the management of noise and vibration so that the above effects are minimised to achieve the environmental objectives for this factor (Section 4.10.3). The protocol outlines management actions to be undertaken to minimise potential impacts during construction, and ensures compliance with relevant legislation.

4.10.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Public/residents	To minimise the impact of noise and vibration emissions from construction activities, machinery and vehicles	Environmental Protection (Noise) Regulations 1997 (Noise Regulations). Noise management plans (if and as required for specific situations)	No reasonable substantiated landholder complaints. Landholder complaints resolved in a timely manner. Compliance with Noise Regulations and approved noise management plans.

4.10.4 Management actions

Activity	Action	Timing	Responsibility
Planning	Schedule activities to avoid construction activities near residences being carried out: • on Sundays and public holidays • after 1900 and before 0700 hours on any other day unless the construction activities can comply with the assigned levels in the Environmental Protection (Noise) Regulations 1997 (Noise Regulations) or are managed in accordance with an approved Noise Management Plan.	When residences are within the distance specified in Table 4-2	Construction Contractor

Activity	Action	Timing	Responsibility
	The noise emissions from construction activities may be monitored to substantiate the expected area of potential impact, with this information used to establish whether activities can be undertaken closer to sensitive receptors than indicated by Table 4-2.		Construction Contractor
	Semi-fixed noise generating equipment (e.g. generators, compressors and campsite equipment) shall be located as far as practicable from surrounding premises.		Construction Contractor
	The accommodation camps shall be located greater than 2 km from neighbouring residences.	As required	Construction Contractor
	Residents in proximity to the pipeline shall be advised of the proposed working schedule.	Prior to construction	Construction Contractor
General requirements	Appropriate mufflers shall be maintained on earth-moving equipment and other vehicles on the site.	At all times	Construction Contractor
	Equipment used within the easement shall be the quietest reasonable practicable.	At all times	Construction Contractor
	All equipment and plant shall conform to appropriate noise control standards.	At all times	Construction Contractor
	All equipment shall be regularly and efficiently maintained to ensure that noise-attenuating measures are operating efficiently.	At all times	Construction Contractor
	Between work periods, machines such as cranes, loaders and generators shall be shut down or set at minimum throttle.	At all times	Construction Contractor
	All mobile machinery and stationary equipment shall be fitted with appropriate noise control equipment (eg. mufflers or sound attenuation enclosures).	At all times	Construction Contractor
	Construction work shall be carried out in accordance with Section 6 of the Australian Standard 2436-1981 “Guide to Noise Control on Construction, Maintenance and Demolition Sites”.	At all times	Construction Contractor
	All noise management plans shall be submitted to the LGA for approval, consistent with the Noise Regulations.	At all times	Construction Contractor
Vehicles	All vehicles shall comply with Australian Design Rules.	At all times	Construction Contractor
	Site speed limits shall be complied with at all times.	At all times	Construction Contractor
Blasting	Blasting shall only be carried out during daylight hours.	At all times	Construction Contractor
Record keeping	Records shall be kept of all noise emission monitoring.	At all times	Construction Contractor
Survey, fencing and service location	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor
Clear and grade	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor
Trenching and excavation	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor
Dewatering	Dewatering pumps shall be the quietest practicably available.	At all times	Construction Contractor
	Dewatering pumps shall be located as far from residences as practicable.	At all times	Construction Contractor
Drilling/boring	Drilling equipment shall be the quietest practicably available.	At all times	Construction Contractor
Pipe stringing and welding	Grinding shall not be undertaken after 7:00 pm and prior to 7:00 am, or on Sundays or public holidays.	Within 1000 m of any residence	Construction Contractor
	Grinding and welding shall be undertaken within the mobile enclosure.	At all times	Construction Contractor
Lowering-in and backfill	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
Clean-up and rehabilitation	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor
Testing and commissioning	Equipment used shall be the quietest practicably available.	At all times	Construction Contractor
Complaints register	All complaints received from landholders shall be recorded and stored in a Complaint register. The ensuing investigation outlining the cause of excessive noise emissions and consultation with the landholder shall also be recorded.	As required	Construction Contractor

4.10.5 Monitoring and recording and recording

Parameter	Frequency	Location	Purpose	Responsibility
Integrity of noise control equipment	As part of construction site inspections.	Entire construction site.	To ensure noise control measures are in good working order.	Construction Contractor

4.10.6 Contingency actions

Trigger	Action	Responsibility
Complaint received from external source	Any complaints shall be considered incidents and shall be managed in accordance with the Environmental Incident Response Protocol (Section 4.1). Noise and vibration monitoring and data recording may be initiated to provide information to support development of a management response.	Construction Contractor
	If deemed necessary, mitigation measures shall be implemented to the satisfaction of DMP in consultation with DEC/LGA.	Construction Contractor

4.11 Fuel and Chemical Storage, Spill and Emergency Response Protocol

4.11.1 Background and environmental risks

The uncontrolled release of fuels and chemicals has the potential to result in the contamination of soil, groundwater and surface water, which may lead to significant environmental impact and harm. On this basis, the storage and use of fuels and chemicals must be managed to minimise the risk of a release, and measures adopted to promptly address these impacts should a release occur.

4.11.2 Purpose and scope of protocol

The purpose of this protocol is to provide for the management of fuel and chemicals to achieve the following environmental objectives.

4.11.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Contamination	Prevent contamination of groundwater, surface water and soil.	Environmental Protection Regulations 1987. Environmental Protection (Unauthorised Discharges) Regulations 2004. Australian Dangerous Goods Code. DBP Spill Prevention and Response Procedure. DBP Hazardous Materials Handling Procedure.	Chemicals and fuels stored and handled within designated areas. No significant spills or leaks of hydrocarbons (in excess of 80 litres) during construction and rehabilitation operations outside of areas designated for maintenance, refuelling or storage. No spills or leaks within 200 m of watercourses. Satisfactory cleanup of any spills or leaks.

4.11.4 Management actions

Activity	Action	Timing	Responsibility
Planning	Strategies shall be developed to deal with a spill of all types of fuel, oil or chemicals to be used on-site.	Prior to construction	Construction Contractor
	Major servicing of plant and equipment shall be undertaken off-site in appropriately equipped areas.	At all times	Construction Contractor
	All construction staff will receive information and training on: • spill management • spill response • refuelling.	Induction	Construction Contractor
	Areas on the CROW within which refuelling is prohibited should be marked on the ELL as designated non-refuelling areas.	Prior to ground disturbing activities	Contractor Construction
	Areas on the CROW that are subject to special conditions regarding refuelling (watercourses) shall be marked on the ELL with those special conditions.	Prior to ground disturbing activities	Contractor Construction
Survey	Areas on the CROW within which refuelling is prohibited shall be marked in the field as designated non-refuelling areas.	Prior to ground disturbing activities	Contractor Construction
	Areas for refuelling within campsites, laydown areas or other areas outside the CROW shall be designated and marked with appropriate signage.	Prior to ground disturbing activities	Contractor Construction

Activity	Action	Timing	Responsibility
Storage	Fuel, chemicals and/or lubricants shall only be stored in the campsite or within the laydown area and not within 200 m of any Conservation Category Wetland or watercourse, or within areas designated to be of conservation value.	At all times	Construction Contractor
	Fuels, lubricants and chemicals shall be stored within containment facilities including: • leak proof trays • impermeable bunds The volume of the containment facility should be sufficient to hold at least 110% of the volume of the largest container of product stored within or on the facility.	At all times	Construction Contractor
	All fuel and chemical storage and handling equipment (including transfer hoses, etc.) shall be kept in a well-maintained condition.	At all times	Construction Contractor
	The location of on-site fuel/chemical storage areas shall be clearly signed and designated.	At all times	Construction Contractor
	Storage and handling of fuels and chemicals shall be in compliance with relevant legislation, regulations and Australian Standards.	At all times	Contractor Construction
Bulk fuel storage and refuelling areas	Containment and recovery equipment (including but not limited to absorbent materials, shovels and sandbag sacks, plastic bags and protective clothing eg. gloves and overalls) shall be provided and maintained at all bulk fuel storage and refuelling areas.	At all times	Construction Contractor
	Vehicles being refuelled from any bulk fuel storage shall be parked over a steel grating and spill capture tank fitted with a drain and fuel/water recovery system.	At all times	Construction Contractor
Refuelling vehicles	Refuelling vehicles shall be equipped with the following to enable quick response to spillages: • 250 L spill kits • spill tray(s) • shovel • containers for temporary storage and transport of contaminated soil.	At all times	Contractor Construction
Refuelling: General	Refuelling shall not be undertaken within designated non-refuelling areas.	At all times	Contractor Construction
	Refuelling procedures shall be adopted to minimise the risk of spills, including measures such as shut-off nozzles and spill buckets.	At all times	Contractor Construction
	High pressure hose shall be used for low pressure pumping of fuel to reduce the risk of hose rupture.	At all times	Contractor Construction
	Absorbent material shall be placed beneath machinery being refuelled in the field to collect any drips and potential spills.	At all times	Contractor Construction
Refuelling: Self-propelled plant	Refuelling of any self-propelled plant within 200 m of any watercourse is prohibited unless this results in a requirement to move the plant more than 400 m to enable refuelling. In this situation, the plant may be refuelled at a location no closer than 50 m from the edge of the watercourse, with the following additional safeguards being applied: 1. Refuelling of self-propelled plant is to be carried out from a mobile tank no larger than 1000 L in capacity, towed to a refuelling location no closer than 50 m from the edge of the watercourse. 2. The refuelling crew will be one experienced fuel truck operator and one experienced off-sider as well as the operator of the individual machine if required. 3. The mobile tank unit may only be refilled in the field from bulk tanker within designated refuelling areas (and not within the 200 m watercourse buffer). 4. Refuelling procedures and safeguards otherwise apply as for designated refuelling areas. Application of these requirements may be varied for specific locations with the written approval of the Department of Mines and Petroleum.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
Refuelling: Non self-propelled plant	Refuelling of non self-propelled plant proximate to watercourses shall be carried out as follows: 1. Refuelling of non self-propelled plant proximate to or within watercourses is to be carried out from a mobile tank no larger than 1000 L in capacity, towed to the location of the non self-propelled plant. 2. The refuelling crew will be one experienced fuel truck operator and one experienced off-sider as well as the operator of the individual machine if required. 3. The mobile tank unit may only be refilled in the field from bulk tanker within designated refuelling areas (and not within the 200 m watercourse buffer). 4. The 1000 L mobile tank will travel between the designated refuelling locations and the non self-propelled plant. 5. Refuelling procedures and safeguards otherwise apply as for designated refuelling areas.	At all times	Construction Contractor
Spillages	Spill kits are to be provided as follows: • all refuelling vehicles carry 250 L spill kits • all vehicles fitted with hydraulic hoses have immediate access to 20 L spill kits • all crews handling hazardous chemicals have immediate access to 20 L spill kits • all supervisors will carry 20 L spill kits.	At all times	Construction Contractor
	All vehicles and equipment shall be adequately maintained to minimise drips/leaks of oil and fuel.	At all times	Construction Contractor
	Spills shall be stopped at source as soon as practicable.	At all times	Construction Contractor
	Spilt material shall be contained to the smallest possible area.	At all times	Construction Contractor
	Spilt material shall be recovered as soon as possible, using appropriate equipment.	At all times	Construction Contractor
	Pipe coating shall be carried out over a spill tray or absorbent material to prevent drips of coating chemicals contaminating the soil.	At all times	Construction Contractor
Material handling and disposal	Hazardous materials or wastes, such as solvents, rust proofing agents and primer, shall be managed, transported, stored and handled in accordance with the requirements of relevant legislation and industry standards (i.e. Australian Dangerous Goods Code and relevant OH&S regulations).	At all times	Construction Contractor
	Contaminated materials such as absorbent pads and soil shall be disposed of to appropriately licensed facilities, consistent with the Waste Management Protocol (Section 4.12).	As required	Construction Contractor
	Handling and disposal of wastes shall comply with the Waste Management Protocol (Section 4.12).	At all times	Construction Contractor
Safety	Material Safety Data Sheets shall be kept for each chemical used on-site and at a location that is easily accessible to all construction personnel.	At all times	Construction Contractor
Designated areas of conservation value	No fuel or chemical storage facilities shall be located within areas of conservation value identified in the ELL.	At all times	Construction Contractor
Reporting	All spills over 2 L shall be considered an environmental incident and reported via the Incident Report Form.	As required	Construction Contractor
Drilling	Only water based drilling fluids shall be used.	At all times	Construction Contractor
	All drilling fluids shall be managed in accordance with the material handling and disposal activity actions of this protocol.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
Trenching and excavation	Fuel powered dewatering pumps shall be bunded to contain spills, using an impermeable liner. The bund shall be large enough to contain 110% of the volume of the pump fuel tank.	At all times	Construction Contractor
Pipe stringing and welding	All hazardous materials, including radiographic processing liquid shall be managed in accordance with the material handling and disposal activity actions of this protocol.	At all times	Construction Contractor

4.11.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Inspections	Weekly. Opportune.	Construction and refuelling areas.	Ensure compliance management protocols.	Construction Contractor
Hydrocarbon and chemical storage	Prior to receipt of hydrocarbon and chemicals.	Storage area.	Ensure that separation distances and bunding as required.	Construction Contractor

4.11.6 Contingency actions

Trigger	Action	Responsibility
Uncontrolled release (i.e. spill, leak)	Further loss of material shall be prevented either by addressing the process control problem or by undertaking repair of faulty pipe, valve or other components.	Construction Contractor
	Spillages shall be immediately contained by constructing earthen bunds or using other containment methods.	Construction Contractor
	Ponded material shall be removed as soon as practicable by pumping into an appropriate storage facility, or withdrawn using an absorbent material.	Construction Contractor
	Contaminated soil or material shall be removed offsite and disposed of in an approved landfill facility.	Construction Contractor
	Person(s) involved in the incident (or witness to) shall notify the Construction Contractor if not already aware of the incident (see below).	Construction Contractor
	An Environmental Incident Report shall be completed for spills greater than 2 L.	Construction Contractor
	Spill response action shall be investigated to ascertain if it was appropriately initiated and achieved objectives.	Construction Contractor
Inappropriate storage of material	Investigate why material is being inappropriately stored.	Construction Contractor
	Initiate action to ensure compliance.	Construction Contractor
	Amend protocol if required.	DSC

4.12 Waste Management Protocol

4.12.1 Background and environmental risks

Waste from the project will include waste generated from construction activities such as welding, and waste from the accommodation camps. Both waste streams have the potential to result in detrimental impacts on the environment and as such will require specific management.

Waste disposal must also be undertaken so as to ensure compliance with relevant environmental legislation, including the Environmental Protection (Controlled Waste) Regulations 2004 and the *Environmental Protection Act 1986*.

Consequently, specific management is required to ensure that waste is appropriately managed to ensure compliance with relevant legislation and minimise potential contamination of the easement.

4.12.2 Purpose and scope

The purpose of this protocol is to provide for the management of generation and disposal of waste materials within the pipeline easement and associated construction areas, to achieve the environmental objectives outlined below.

4.12.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Waste management	Minimise generation of waste during construction.	*Environmental Protection Act 1986* (Part V) Environmental Protection (Controlled Waste) Regulations 2004. Environmental Protection (Unauthorised Discharges) Regulations 2004. DBP Waste Management Procedure.	Minimisation of waste generation.
	Minimise pollution or environmental harm due to inappropriate disposal of waste.	*Environmental Protection Act 1986* (Part V) Environmental Protection Regulations 1987. DBP Waste Management Procedure.	No uncontained waste, rubbish or litter is found within CROW or at facilities during construction. No waste found within CROW or at facilities immediately following construction. A waste register is maintained during construction indicating waste categories, approximate volumes of waste, and location of disposal. Waste material is contained and disposed of in accordance with the *Environment Protection Act 1986*.

4.12.4 Management actions

Activity	Action	Timing	Responsibility
Planning	Waste management strategies shall be developed for each waste stream based on the principles of reduce, reuse, recycle and appropriate disposal.	Prior to commencing any waste producing activities	Construction Contractor
General	All waste shall be removed from the site for reuse/recycling/disposal.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
	All waste shall be collected and transported to appropriately licensed disposal sites.	As required	Construction Contractor
	High emphasis shall be placed on housekeeping and cleanliness at the site.	At all times	Construction Contractor
	Records shall be kept of all waste removed from site.	At all times	Construction Contractor
	No waste materials shall be stored within a Wellhead Protection Zone.	At all times	Construction Contractor
Ablution facilities	Temporary portable sanitary or ablution facilities shall be provided on-site (in the laydown areas and campsites) where existing facilities are not present.	Prior to construction activities	Construction Contractor
	Ablution facilities shall be regularly cleaned and maintained.	At all times	Construction Contractor
	Septage collected within portable sanitary or ablution facilities shall be either removed by a licensed contractor and disposed of to a licensed facility, or treated and disposed of through an appropriately approved on-site facility operated by the Construction Contractor.	As required	Construction Contractor
Oil, solvents and Chemicals	Chemical wastes (e.g. spent x-ray film developer chemicals) shall be collected in appropriately labelled drums.	At all times	Construction Contractor
	Waste oil, solvents and other toxic material, shall be collected for off-site reuse, recycling, treatment or disposal.	At all times	Construction Contractor
	Chemical wastes, waste oils, solvents and other toxic material shall be stored in appropriately bunded areas prior to off-site disposal.	At all times	Construction Contractor
	Licensed carriers shall be used for off-site transport and disposal.	As required	Construction Contractor
Hygiene stations	Seed, soil and organic matter removed during clean-down activities shall be collected in a sealed container for disposal.	As required	Construction Contractor
	Seed, soil and organic matter removed during clean-down activities shall be disposed of at approved landfill facilities or within areas that have been determined to be weed infested.	As required	Construction Contractor
Pipe stringing and welding	Timber skids, pallets, rope spacers, drums and scrap metal shall be stockpiled separately for salvaging or recycling.	At all times	Construction Contractor
	Welding refuse, including electrode stub-ends shall be retrieved for disposal at an approved waste disposal site and shall not be discarded in the pipe trench.	At all times	Construction Contractor
	All bonding and dunnage from transport vehicles and unloading areas shall be collected and transported offsite to approved disposal facilities.	As required	Construction Contractor
	All hazardous materials, including radiographic liquid processing waste, shall be managed consistent with the actions outlined in the Oil, Solvents and Chemicals in this protocol.	At all times	Construction Contractor
	Empty paint tins and used brushes shall be disposed of at licensed facilities.	As required	Construction Contractor
Drilling and boring	Drilling mud and cuttings shall be disposed of to a licensed waste disposal centre unless alternative reuse options or disposal sites have been approved.	As required	Construction Contractor
Trench dewatering	Disposal of water shall be consistent with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times	Construction Contractor
Hydro-test water	Disposal of water shall be consistent with the Dewatering and Water Disposal Management Protocol (Section 4.4).	At all times	Construction Contractor
Rehabilitation	All waste material shall be removed from the CROW on completion of each section of the pipeline.	As required	Construction Contractor
Construction camps	Litter bins shall be provided within campsites and construction storage yards/laydown areas.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
	Litter bins and waste containers shall be covered as necessary to prevent: • access by fauna • waste falling out of the container as a result of overfilling • waste material being blown out of the container by wind.	At all times	Construction Contractor
	All waste storage containers shall be regularly emptied and waste removed from site.	At all times	Construction Contractor
	Domestic campsite wastes (e.g. sewage, kitchen/putrescible, grey water, packaging etc) shall be disposed of to a licensed facility.	At all times	Construction Contractor
	Hydrocarbon wastes, including lube oils, shall be collected for safe transport off-site for reuse, recycling, treatment or disposal at approved locations.	At all times	Construction Contractor
	Licensed carriers shall be used for the transport of all controlled wastes (such as liquid waste).	At all times	Construction Contractor
	Waste fuels, waste hydrocarbons and other waste chemicals shall be stored and handled in accordance with the Fuel and Chemical Storage, Spill and Emergency Response Protocol (Section 4.11).	At all times	Construction Contractor

4.12.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Inspection	Weekly Opportunistic	Construction areas and campsite.	Ensure appropriate disposal of waste material.	Construction Contractor
Record keeping	All inspections and waste disposal activities as they occur.	Construction areas and campsite.	Ensure appropriate disposal of waste material.	Construction Contractor

4.12.6 Contingency actions

Trigger	Action	Responsibility
Inappropriate disposal of waste	Investigate cause of inappropriate disposal.	Construction Contractor
	Initiate action to rectify disposal methods.	Construction Contractor
	Amend protocol to avoid recurrences.	DSC
Ablution facilities inappropriately cleaned	Investigate cause of concerns.	Construction Contractor
	Contact contractor to rectify.	Construction Contractor

4.13 Soil Management Protocol

4.13.1 Background and environmental risks

Topsoil is an important resource in CROW rehabilitation as it provides nutrients, biomass and productivity for vegetation and contains a significant seed bank. Inappropriate soil management increases the risk of erosion, sedimentation, and mixing of the soil profiles, potentially resulting in environmental impacts on surrounding vegetation, waterbodies and residents.

Topsoil performs a vital role in rehabilitation processes, and the loss or contamination of topsoil (with subsoil) may reduce the success of rehabilitation efforts.

4.13.2 Purpose and scope

The purpose of this protocol is to provide for the effective management of soil and disturbed areas to achieve the environmental objectives outlined below.

4.13.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Topsoil	Minimise change to soil profile from excavation activities.	*Agriculture and Related Resources Protection Act 1976.* *Soil and Land Conservation Act 1945.*	No evidence of subsoil on surface (as detected by colour and texture) within CROW following backfill. No visual evidence of soil compaction following backfill and rehabilitation (e.g. hard soil, local water pooling).
Erosion	Prevent occurrence of soil erosion during and following construction.	*Soil and Land Conservation Act 1945.*	The extent of soil erosion within the CROW during and within two years following construction is consistent with surrounding land. No visible soil erosion from CROW during or within three years following construction.

4.13.4 Management actions

Activity	Action	Timing	Responsibility
Topsoil	The top 100-150 mm of topsoil shall be removed from any areas where soil disturbance is likely to occur as a consequence of the construction process, and includes: • all areas to be subjected to excavation • all areas where spoil from excavations is to be stored • all areas where construction machinery is operating • all areas on the CROW which will be used in any way during construction • all areas where soil inversion or loss of topsoil is likely as a result of any activities associated with construction, including at facilities such as camp sites. The exception to the above is areas that do not contain native vegetation and where there is a formal agreement with the landowner to leave topsoil in place.	As required	Construction Contractor
	Any topsoil removed, including leaf litter shall be stockpiled to one or either side of the easement with breaks provided in the stockpiles to allow water and stock movement.	At all times	Construction Contractor
	The topsoil shall be stockpiled in a manner so that it can be easily returned to the CROW during reinstatement.	At all times	Construction Contractor

Activity	Action	Timing	Responsibility
	Graded topsoil shall be stockpiled separately from cleared stockpiled ground cover vegetation and other excavated material (e.g. trench spoil, padding material, etc).	At all times	Construction Contractor
Stockpiles	Trench spoil (backfill soil) shall be stockpiled separately from topsoil.	As required	Construction Contractor
	Trench spoil stockpiles shall be located immediately adjacent to the area from which soil was removed, except in major watercourses where trench spoil stockpiles may be located out of the watercourse, but as close as practically possible to the watercourse without impacting riparian vegetation	As required	Construction Contractor
	Topsoil stockpiles shall not be located where they have the potential to contribute to sedimentation of land or surface water.	At all times	Construction Contractor
	Stockpiles shall be stored away from watercourse banks to reduce the impact on bank vegetation.	As required	Construction Contractor
	Bank spoil shall be stored to the side of the easement and away from the riparian vegetation on the top of the river banks so as to minimise the disturbance to the river banks.	As required	Construction Contractor
	River overburden (sand) stockpiles shall be located in open areas within the river bed so as to not disturb existing river bed vegetation.	As required	Construction Contractor
	Overburden (other than river overburden) shall be stockpiled away from stream banks, beds and riparian zones and windrows broken either side of waterways.	At all times	Construction Contractor
	Stockpiles shall not be graded across property boundaries. A break in the windrow shall be maintained at property boundaries.	Property access points	Construction Contractor
Erosion	Temporary and/or permanent soil erosion berms, drains and sediment barriers shall be installed, where required, for erosion protection.	As required	Construction Contractor
	Design of erosion and sediment control measures shall consider site conditions such as wind, rainfall frequency and intensity, soil type, infiltration rates, gradient, catchment area, vegetation cover and condition.	As required	Construction Contractor
Padding	Where practicable, padding material shall be reclaimed from trench spoil.	As required	Construction Contractor
	Imported padding material shall be demonstrated to be disease and weed free and be non-acid sulphate soils (ASS).	As required	Construction Contractor
	Topsoil shall not be used as backfill or padding.	At all times	Construction Contractor
	As much rock material as possible shall be returned to the trench, without threatening the integrity of the pipe coating.	As required	Construction Contractor
Rehabilitation	In the event that excavation (bell holes) or a drilling platform is required, topsoil shall be cleared from the site and stockpiled separately from subsoil to allow the subsequent backfilling of soil in the correct horizons.	At all times	Construction Contractor

4.13.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
Erosion	Opportune	Active construction areas	Ensure that erosion control measures are effective.	Construction Contractor
Stockpiles	Opportune	Stockpiles	Ensure that separation of soil profiles is being observed. Ensure that stockpiles are not impeding access to property or fauna.	Construction Contractor
Photographs of topsoil stockpiles	Immediately following backfilling	Construction right-of-way	To demonstrate that topsoil has not been used for backfilling	Construction Contractor

4.13.6 Contingency actions

Trigger	Action	Responsibility
Erosion	Investigate cause.	Construction Contractor
	Implement remedial action.	Construction Contractor

4.14 Aboriginal Heritage Site Management Protocol

4.14.1 Background and environmental risks

Construction activities that physically disturb the land surface or subsurface profile (e.g. clear and grade, trenching), may unearth and/or destroy Aboriginal artefacts or skeletal remains and may also have the potential to disturb known Aboriginal sites adjacent to construction areas identified for protection. Consequently, specific management is required to minimise the risk of construction activities detrimentally affecting or destroying heritage sites and to ensure compliance with relevant legislation.

4.14.2 Purpose and scope of protocol

The purpose of this protocol is to provide for the management and protection of known (e.g. recorded) Aboriginal heritage sites identified for protection and any new sites/artefacts uncovered or identified during construction, to achieve the environmental objectives for the heritage factor. The protocol will apply to the full length of the pipeline easement.

4.14.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Known (recorded) Aboriginal heritage sites	To avoid disturbance to Aboriginal heritage sites identified for protection near the pipeline easement.	*Aboriginal Heritage Act 1972 s 18 permits*.	No disturbance to Aboriginal heritage sites identified for protection. Conformance with s 18 permit conditions.
New (unrecorded) Aboriginal heritage sites	To manage new Aboriginal heritage sites/artefacts uncovered or identified during construction in accordance with the requirements of the *Aboriginal Heritage Act 1972*.	*Aboriginal Heritage Act 1972*.	All new Aboriginal heritage sites managed in accordance with the *Aboriginal Heritage Act 1972*.

4.14.4 Management actions

Activity	Action	Timing	Responsibility
General requirements	The induction program shall involve an Aboriginal Heritage component to ensure all personnel are aware of obligations under the *Aboriginal Heritage Act 1972,* and the requirements for the protection of known Aboriginal heritage sites and are directed to avoid any disturbance to the sites.	Induction	Construction Contractor
	The induction program shall ensure personnel are informed of the possibility of encountering new sites and what may constitute a site/artefact.	Induction	Construction Contractor
	Aboriginal heritage sites to be protected shall be recorded on the Environmental Line List (ELL).	Prior to construction	DSC
	Erosion control measures shall be installed as required to protect sites near the pipeline easement.	Prior to construction	Construction Contractor
Survey and Fencing	Heritage sites near construction activities identified for protection shall be clearly flagged and/or fenced.	Prior to construction	Construction Contractor
Clear and grade	Qualified site heritage monitors and archaeologists (issued with a Section 16 permit) shall be onsite to monitor clear and grade activities for areas designated in the ELL (e.g. areas considered to have a high potential to contain additional surface or sub-surface archaeological material).	As outlined in the ELL	Construction Contractor
Trenching and excavation	Qualified site heritage monitors and archaeologists (issued with a Section 16 permit) shall be onsite to monitor trenching activities for areas designated in the ELL (e.g. areas considered to have a high potential to contain additional surface or sub-surface archaeological material).	As outlined in the ELL	Construction Contractor

Activity	Action	Timing	Responsibility
Clean-up and rehabilitation	All flagging and fencing used to identify and protect heritage sites (if any) shall be removed. Erosion control measures not required post-construction (if installed) shall be removed.	At completion of construction activities	Construction Contractor

4.14.5 Monitoring and recording

Parameter	Frequency	Location	Purpose	Responsibility
New (unrecorded) Aboriginal heritage sites, artefacts or skeletal remains	During clear and grade, and trenching	All active construction areas.	To ensure no new heritage sites or artefacts (e.g. currently unrecorded sites) are disturbed or destroyed by construction activities in contravention of the *Aboriginal Heritage Act 1972*.	Construction Contractor

4.14.6 Contingency actions

Trigger	Action	Responsibility
Previously unrecorded Aboriginal heritage site/artefact is uncovered or identified	Immediately cease construction operations within 30 m of the potential heritage site.	Construction Contractor
	Establish a 30 m buffer around the potential heritage site, outside which work may continue.	Construction Contractor
	Notify DSC appointed archaeologist and the Department of Indigenous Affairs (DIA) (if not already present). The Police and State Coroner shall be contacted in the instance of the discovery of skeletal remains. If it is determined the remains are Aboriginal, the Commonwealth Minister for Aboriginal Affairs shall be notified (legal requirement under the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* – Section 20(1).	Construction Contractor
	The authenticity of the site or material shall be determined using appropriate methods, in consultation with all relevant stakeholders, and suitable mitigating/management measures, once agreed upon by all stakeholders, shall be implemented as soon as practicable. Where disturbance to the site cannot be avoided, consent to disturb the site shall be obtained under Section 18 of the *Aboriginal Heritage Act 1972*. Where disturbance to the site can be avoided (i.e. through reduced working widths), actions may include compiling a detailed site record, collection of the cultural material or protection of the site (e.g. fencing).	Construction Contractor
	Complete and forward an Incident Report to the appropriate person(s).	Construction Contractor
Disturbance of an existing Aboriginal heritage site identified for protection	Immediately cease all work in the area of the heritage site	Construction Contractor
	Investigate the cause of disturbance	Construction Contractor
	Implement actions to prevent disturbance from reoccurring (e.g. fencing site or re-informing workforce).	Construction Contractor
	If necessary, consult with relevant stakeholders (e.g. DIA) to determine actions required to restore the site to its original condition.	Construction Contractor
	Complete and forward an Incident Report to the appropriate person(s).	Construction Contractor

4.14.7 Recording

All new Aboriginal heritage sites or disturbances to sites identified for protection shall be recorded in accordance with the Incident Reporting procedures and a report prepared and submitted to the DIA within seven days of the discovery/disturbance incident. The report shall outline the nature of the discovery, the extent and significance of any disturbance, and any mitigation/management measures implemented.

4.15 Rehabilitation Protocol

4.15.1 Background and environmental risks

The final phase of the project is Clean-up and Rehabilitation (Reinstatement), which involves:

- removing construction materials from the CROW (e.g. skids, palettes, survey pegs, flagging, etc)
- shaping the land surface to match the existing contours, including compacting material back into side cuts
- ploughing or ripping of compacted areas by graders
- construction of final sediment and erosion controls from subsoil
- respread topsoil and cleared vegetation/brush across the CROW.

Effective rehabilitation will minimise the risk of introducing weed species, minimise disturbance of fauna through re-establishing habitat and stabilising disturbed areas; reducing the potential for erosion and sedimentation of surrounding water bodies.

Native vegetation removed from the CROW will be respread to aid in sediment and erosion control, retain moisture and to aid establishment of seeds/seedlings and revegetation of the CROW. Active rehabilitation (seeding) in remnant vegetation will only be conducted on areas that do not respond to the initial rehabilitation treatment.

DSC will finalise rehabilitation objectives on private land, with the concerned landowner prior to ground disturbing activities. These objectives and specific environmental management requirements will be added to the Environmental Line List (ELL) as required.

4.15.2 Purpose and scope of protocol

The purpose of this protocol is to guide reinstatement of the CROW and associated construction areas to achieve the following environmental objectives (Section 4.15.3).

For the purpose of this protocol, the term 'Threatened Flora' is used to collectively describe DRF, Priority Flora and Threatened Flora listed under the EPBC Act.

4.15.3 Environmental objectives and key performance criteria

Issue	Objective	Performance standard	Management criteria
Vegetation	To re-establish vegetation and associated habitat areas to the condition that it was in prior to disturbance or better.	Completion criteria.	Achievement of completion criteria set out in Section 4.15.7[17].
Soil	To control sediment and erosion.	*Soil and Land Conservation Act 1945.*	Achievement of the completion criteria set out in Section 4.15.7. The extent of soil erosion within the CROW during and within two years following construction is consistent with surrounding land. No visible soil erosion from CROW during or within three years following construction

[17] There are obligations under the Department of Industry and Resources legislation to maintain the vehicle access track and certain completion criteria may not be achievable within the access track.

4.15.4 Management actions

Issue	Action	Responsibility
ELL	Areas requiring rehabilitation other than spreading of vegetation and re-seeding shall be entered onto the Environmental Line List (ELL).	DSC
Clean-up	All waste materials (e.g. bags, pegs, skids, pillows) and equipment shall be removed from the construction areas once backfilling and tie-ins are completed.	Construction Contractor
	All flagging and bunting installed for other than environmental or safety reasons shall be removed from the construction areas once backfilling and tie-ins are completed.	Construction Contractor
	Small amounts of rocks and stones generated by the construction process shall be distributed evenly over the CROW. Where larger volumes of such material have been produced, consideration shall be given to its removal from site.	Construction Contractor
Infrastructure	All temporary gates shall be removed (unless required for operational reasons) and the fence reinstated to at least as good has the pre-construction condition. Gates removed from the fence line shall be returned.	Construction Contractor
	Any third party infrastructure disturbed during construction shall be restored to the owner's satisfaction.	Construction Contractor
	Public roads and tracks used during construction shall be returned to their pre-construction state, or to a condition agreed to with the landholder.	Construction Contractor
	All fences that were cut and replaced by gates during construction shall be repaired to at least the equivalent pre-construction condition, unless permanent gates or other arrangements are agreed to with the landholder.	Construction Contractor
Ripping	Areas subject to high traffic movements during construction to be rehabilitated shall be ripped to a depth of 30 cm, where necessary, prior to respreading topsoil.	Construction Contractor
Topsoil	Topsoil spreading will be managed in accordance with the Soil Management Protocol (Section 4.13) and with the completion criteria set out in Section 4.15.7.	Construction Contractor
Vegetation	Vegetation spreading will be managed in accordance with the Flora and Vegetation Management Protocol (Section 4.2) and with the completion criteria set out in Section 4.15.7.	Construction Contractor, DSC
Erosion	Erosion shall be managed in accordance with the Soil Management Protocol (Section 4.13) and with the completion criteria set out in Section 4.15.7.	Construction Contractor
	If the construction works result in subsequent erosion of watercourses, reasonable remedial action will be taken if requested by the DoW. This would require that the erosion is demonstrably attributable to the construction work or an associated activity by DSC.	DSC
Watercourses	Watercourse crossings shall be managed in accordance with the Watercourse Crossing Management Protocol (Section 4.7).	Construction Contractor
Weeds	Weeds shall be managed in accordance with the Weed Management Protocol (Section 4.3) and with the completion criteria set out in Section 4.15.7.	Construction Contractor

4.15.5 Monitoring and recording

Issue	Action	Timing	Responsibility
Native species	Species abundance and, distribution within the CROW after rehabilitation.	12 months after reinstatement	DSC
	Records of visual and photo monitoring.	Prior to clear and grade and immediately following reinstatement	Construction Contractor
	Records of visual and photo monitoring.	12 months after reinstatement	DSC
Weed assessment	Quadrant and photo-point monitoring of rehabilitation in areas of remnant vegetation.	Immediately following reinstatement	Construction Contractor
	Weed species richness and cover to facilitate management of weed issues.	Following completion of reinstatement	Construction Contractor
Erosion	Inspections of the soil shall be undertaken in the 12-month period following the completion of construction to determine subsequent erosion and changes in the drainage patterns, and any further rehabilitation measures required determined in consultation with regulators.	12 months following reinstatement	DSC

Issue	Action	Timing	Responsibility
	If the construction works result in subsequent erosion of watercourses, reasonable remedial action will be taken if requested by the DoW. This would require that the erosion is demonstrably attributable to the construction work or an associated activity by DSC.	At any time following completion of construction	DSC
	Records of visual and photo monitoring.	Prior to clear and grade and following reinstatement	Construction Contractor
Landowner satisfaction	Following reinstatement, DSC and the Construction Contractor shall meet with affected landowners to discuss rehabilitation and further ongoing management.	Following reinstatement	DSC and Construction Contractor

4.15.6 Photo monitoring

Photo monitoring shall be conducted to monitor reinstatement, with two photographs taken at each point – one in each direction along the easement, immediately prior to clear and grade and immediately following reinstatement. At a minimum, two photos shall be taken at spacing no greater than 50 m. The two photos at each point are to be looking in both directions along the CROW alignment. These photo monitoring locations shall be used for subsequent monitoring of rehabilitation progress.

The future access for vehicles near the pipeline is critical for ongoing maintenance and or operational activities along the pipeline. Therefore, parts of the CROW will remain disturbed as a result of the need for an access track. The existing track may be relocated within the pipeline easement to cater for access to two pipelines.

Because of the obligation to strip all topsoil, any monitoring quadrats shall be located immediately adjacent to the CROW in vegetation type and density that is consistent with the area to be cleared.

Monitoring shall be conducted annually post wet season, until the rehabilitated areas have regenerated to a stable condition, to the satisfaction of DEC.

After completion, the entire CROW shall be reviewed for bare areas and weed infestations. Once the rehabilitation programme is complete, this monitoring shall be captured in the ongoing operational management of the pipeline.

Propagule augmentation may be necessary to achieve completion criteria.

4.15.7 Rehabilitation Completion Criteria

Aspect	Objective	Criteria	Assessment Method
Construction	To ensure that the key commitments implemented during the construction phase will assist in maximising the recovery of the native flora and vegetation on the pipeline CROW.	100% compliance with the weed hygiene protocol.	Audit during the operation.
		Vegetation and topsoil is cleared and stored in compliance with CEMP.	Audit during the operation.
		Significant plant species are protected in accordance with the CEMP.	Audit during the operation.
Decommissioning	To ensure that all visual disturbances are removed by prompt remedial action to the greatest extent practicable.	All equipment, materials and litter are removed from the area of disturbance.	Visual inspection of the area of disturbance.
Erosion	To reinstate the land to provide suitable conditions for natural re-colonisation of native vegetation and support natural surface water	Re-instatement of natural contours to pre-disturbance conditions.	Visual inspection of area of disturbance.
		No active erosion rills in excess of the surrounding land.	GPS record and physical measurement of any points of erosion.

Aspect	Objective	Criteria	Assessment Method
	movement.	In erosion prone areas, within the 30 m wide CROW, individual bare patches must not exceed 10 m in length, and the cumulative sum of bare patches must not exceed 10% of the total area of each consecutive 100 m length of CROW after 12 and 24 months.	Visual assessment. Note this criterion does not apply in areas that were previously bare.
Weeds	To facilitate the establishment of native plant species, where native vegetation has been removed during the construction process.	Minimise the spread and intensification of weed infestations through vehicle hygiene protocols.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		The foliage cover of declared and environmental weeds within disturbed areas should be similar to vegetation immediately adjacent to the area of disturbance after 12 and 24 months.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
Flora and Vegetation (where native vegetation has been removed during the construction process)	To facilitate the establishment of native plant species, where native vegetation has been removed during the construction process.	A minimum of 1 native plant per square metre when averaged over the entire area rehabilitated at 12 months, or the pre-construction density, whichever is the lesser. A minimum of 2 native plants per square metre when averaged over the entire area rehabilitated at 24 months, or the pre-construction density, whichever is the lesser.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		Percentage foliage cover of native species indigenous to each plant community is greater than or equal to 40% of foliage cover in vegetation immediately adjacent to the area of disturbance after 24 months (excluding pipeline access track) , or the pre-construction cover, whichever is the lesser.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.
		Species richness of greater than or equal to 50% (unless negotiated otherwise with DEC) in vegetation immediately adjacent to the area of disturbance after 24 months, or the pre-construction density, whichever is the lesser.	Visual inspection of the area of disturbance, with backing from photographs, baseline surveys and rehabilitation monitoring datasets.

4.15.8 Contingency actions

If monitoring indicates that the criteria are not being met after 12 months (Loops 8 to 10) and 24 months (Loops 0 to 7), remedial action shall be discussed with DEC and DMP. Remedial action within failed areas may include active reinstatement such as ripping, seeding or active weed control. In the event that reseeding is required, DEC will be invited to participate in the reseeding process (e.g. identify suitable seed lists, witness reseeding activities).

Areas of high weed cover will be treated, with a program developed in consultation with the Department of Agriculture and Food (DAF) and Department of Environment and Conservation DEC, and designed to ensure weed infestations are at least comparable to pre-construction levels and, where possible, less than those baseline levels.

While best endeavours will be made to achieve these Completion Criteria there may be some exclusions in the event that uncharacteristic seasonal weather conditions prevail. This shall be taken into consideration in relation to the Completion Criteria. In the event of areas not meeting Completion Criteria, joint site reviews will be undertaken to determine appropriate remedial action, if required, to DEC requirements.

5. Stakeholder consultation

DSC has undertaken a program to identify and consult stakeholders, including local residents and all landholders whose properties will be affected by the project, to inform them of the project, the proposed schedule of construction works and the actions that will be undertaken to minimise potential impacts.

<<Details of consultation to be inserted.>>

DSC and its contractors will continue this consultation program to ensure stakeholders are kept informed on the project and to minimise disruption to landowners affected by both pre-construction and construction activities. Many of the management actions, particularly those with the potential to impact on neighbouring residences including dust, noise and rehabilitation, require continued ongoing consultation with landowners.

6. Administration

6.1 Auditing

Assessment of the level of compliance will be undertaken through a number of methods and at different timeframes throughout the life of the project. Construction areas shall be subject to weekly inspections during construction, to be undertaken by the construction contractor(s). Relevant documentation to be reviewed during these inspections may include Environmental Incident Reports, waste disposal forms and previous records of inspection, to check whether problems or non-adherences to the Management Protocols have been rectified. Monitoring will be undertaken on an as required basis, dependent upon the management protocols being implemented.

Auditing will be undertaken separately from the contractor inspections, and will assess and record whether activities are being undertaken in compliance with regulatory requirements and the objectives and requirements set out in this CEMP. The audit program will involve:

1. Regular internal audits by DSC at frequencies no less than one every three weeks during the construction phase—to assess implementation of key management actions and protocols and may involve specialist auditors.
5. Formal environmental compliance audits as required under the conditions of environmental approval—to assess compliance with the objectives and requirements of this CEMP.

The internal audits will be undertaken by suitably qualified environmental personnel employed by DSC to ensure contractors are fulfilling environmental obligations. The formal compliance audits will be undertaken by an external auditor, conducted in accordance with an agreed Audit Protocol.

The findings of environmental audits will be submitted to the Project Manager, and used to develop and implement rectification plans as required. The auditable parameters for the project shall be based on the objectives and performance criteria presented under each of the protocols in Section 4.

6.2 Review and revision

Revision of the CEMP and associated Management Protocols may be required to ensure that the proposed management actions are current and effective in achieving the management objectives. As such, a “change management” process is required to ensure that regulatory bodies and the proponent may request and be involved in the development of new or additional management protocols. The “change management” process must be capable of ensuring that all versions of the document, held by the various parties, are updated with recent amendments.

6.3 Reporting

DSC shall maintain an appropriate and auditable record system in accordance with its EMS. Environmental reporting shall be conducted in accordance with the conditions of all approval instruments.

Environmental incidents and identified instances of non-compliance with the CEMP shall be recorded and reported on an Incident Report proforma in accordance with the Environmental Incident Response Protocol (Section 4.1), and actions taken to close out the incidents.

7. Bibliography and abbreviations

7.1 Bibliography

Acoustical Surfaces Inc 2006, *Inverse Square Law* [online] available from http://www.acousticalsurfaces.com/acoustic_IOI/101_5.htm [downloaded 20/06/06].

Australian Pipeline Industry Association (APIA) Inc 1998, *Code of Environmental Practice*, APIA.

Department of Water (DoW) 2006, *Dewatering of soils at construction sites*, Water Quality Protection Note 13, April 2006.

Department of Water (DoW) 2006a, *Tanks for temporary elevated fuel and chemical storage - Water Quality Protection Note 58,* Perth, Western Australia*, April 2006*.

Department of the Environment, Water, Heritage and the Arts (DEWHA) 2008, *Rangelands 2008 - Taking the pulse*, *Australian Collaborative Rangeland Information System: Reporting Change in the Rangelands*, [Online], Department of the Environment, Water, Heritage and the Arts, Available from:< *http://www.environment.gov.au/land/publications/acris/report08.html*> [1 May 2013].

Mattiske Consulting Pty Ltd (Mattiske) 2013, *Flora and Vegetation of the CS2 – Tubridgi – Wheatstone Gas Pipeline Project Area*, report prepared for DBP*,* May 2013*.*

Ninox Wildlife Consulting 2013, *A Level 1 Vertebrate Fauna Assessment of the Proposed Wheatstone Gas Pipeline, Western Australia*, report prepared for Mattiske Consulting Pty Ltd, May 2013.

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7.2 Abbreviations and acronyms

Table 7-1: Abbreviations

Abbreviation	Full Title
ALARP	As low as reasonably practicable
ANZECC	Australian and New Zealand Environment Conservation Council
APIA	Australian Pipeline Industry Association Inc
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
ASS	Acid sulphate soils
Cwlth	Commonwealth
d	day
DAF	Department of Agriculture and Food
dB	Decibel
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DBP	Dampier Bunbury Pipeline (the trading name of the DBNGP group of companies)
DEC	Department of Environment and Conservation (WA)
DEP	Department of Environmental Protection (former)
DIA	Department of Indigenous Affairs
DO	Dissolved oxygen
DoE	Department of Environment (former)
DMP	Department of Mines and Petroleum
DoW	Department of Water
DRF	Declared Rare Flora
DSC	DBP Services Co Group
DUET	Diversified Utilities and Energy Trust
EC	Electrical conductivity
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELL	Environmental Line List
EMS	Environmental Management System
ENV	Effective neutralising value
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPP	Environmental Protection Policy
ESA	Environmentally Sensitive Area
FESA	Fire and Emergency Services Authority
GDE	Groundwater dependent ecosystems
GPS	Global Positioning System
ha	Hectare
HDD	Horizontal directional drilling
Heritage Act	*Heritage of Western Australia Act 1990* (WA)
IBRA	Interim Biogeographic Regionalisation for Australia

Abbreviation	Full Title
IUCN	International Union for the Conservation of Nature
JESHA	Job environmental safety hazard analysis
km	kilometre
KP	Kilometre Point
kW	kilowatt
LGA	Local Government Authority
m	metre
mAHD	metres above Australian Height Datum
mBGL	metres below ground level
ML	Megalitres
mm	Millimetre
OEMP	Operational Environmental Management Plan
pH_F	Field pH
pH_{FOX}	Field pH after oxidation with hydrogen peroxide
RLDL	Department of Regional Development and Lands
RWI Act	*Rights in Water and Irrigation Act 1914*
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Cwlth)
TDS	Total dissolved solids
TEC	Threatened ecological community
TJ	Tetra-joules
WA	Western Australia
WAPC	Western Australian Planning Commission
Wildlife Act	*Wildlife Conservation Act 1950* (WA)
WRC	Water and Rivers Commission (now DoW and DEC)