Dampier To Bunbury Natural Gas Pipeline - Environmental Plan

Public Summary

Australian Gas Infrastructure Group

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Definitions and Abbreviations

Term	Meaning/ Description
ACV	Authorisation to Clear Vegetation
AGIG	Australian Gas Infrastructure Group
ALARP	As Low As Reasonably Practicable
AMP	Asset Management Plan
AS	Australian Standard
Aspect	Elements of the operator's activities, products, or services that may interact with the environment. Includes planned and unplanned activities.
ASS	Acid Sulphate Soils
ASSMP	ASS Management Plan
BEP	Burrup Extension Pipeline
CBA	Cost benefit analysis
CCVT	Closed Cycle Vapour Turbine (Turbogenerator)
CKI	CK Infrastructure Holdings Limited
Clearing	The killing or destruction of; removal of; severing of trunks or stems; or the doing of any other substantial damage to native vegetation in an area.
CMP	Crisis Management Plan
CMT	Crisis Management Team
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, impact, injury, an expressed concern, disadvantage or gain.
CP	Cathodic Protection or Corrosion Protection
CRS	Customer Reporting System
CS	Compressor Station
Cth	Commonwealth
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DBP	Dampier Bunbury Pipeline - group of companies that own and operate the DBNGP
DEC	Department of Environment and Conservation
DEMIRS	Department of Energy,Mines, Industry Regulation and Safety
DWER	Department of Water and Environmental Regulation
EGM TAM	Executive General Manager Transmission Asset Management
EGM TO	Executive General Manager Transmission Operations
EHB	European House Borer
EP	Environment Plan
EPBC	Environment Protection and Biodiversity Conservation
EPO	Environment Performance Objectives
ERP	Emergency Response Plan
EMT	Emergency Management Team
ESD	Ecologically Sustainable Development
GIS	Geographic Information System
HAZID	Hazard Identification study
HSE	Health, Safety and Environment
IMT	Incident Management Team
Inherent Risk	The risk rating for an event before control measures (EPSs) are applied, reflects the worst-case scenario.
ITP	Inspection Test Plan
KLV	Kwinana Line Valve
km	Kilometre
KP	Kilometre Point

Term	Meaning/ Description
Landholder	Those who hold any underlying tenure or interest in the land in which the pipeline is held. This includes freehold landowners, lessees, pastoralists, Native Title bodies and Claimants, local government authorities, government departments and other utilities.
LGA	Local Government Area
Likelihood	The probability or frequency of an event occurring.
LMS	Land Management System
MAE	Major Accident Event
MAOP	Maximum Allowable Operating Pressure
MLV	Main Line Valve
mm	Milimetre
MNES	Matters of National Environmental Significance
MPa	Mega Pascal
Native vegetation	Any indigenous vegetation; be it aquatic or terrestrial; living or dead (excluding plantations).
NGERS	National Greenhouse and Energy Reporting Scheme
OSCP	Oil Spill Contingency Plan
PAH	Power Asset Holdings Limited
PEC	Priority Ecological Communities
Petroleum activity	Any operations or works carried out in the State under a petroleum, geothermal, or pipeline instrument; or any other operations or works carried out in the State relating to petroleum or geothermal exploration or development, or to a pipeline which may have an environmental impact.
PL	Pipeline Licence
PPE	Personal protective equipment
psi	Pounds per square inch
Residual risk	The risk rating for an event after control measures (EPSs) are applied.
RiWI Act	Rights in Water and Irrigation Act 1914
RMZ	Restricted Movement Zones
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
TEC	Threatened Ecological Community
WA	Western Australia

1. INTRODUCTION

1.1 Background

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) was constructed and commissioned in 1984 to transport natural gas from the north-west of Western Australia (starting near the township of Dampier) to commercial, industrial and domestic markets in the south-west of the State (finishing at MLV157 (Clifton Road) near the city of Bunbury).

Pipeline licenses (PL 40, 41, 47, 69, 91, 94, 95, 100, 101 and 123) have been issued under the Western Australian (WA) *Petroleum Pipelines Act 1969* (PP Act) to allow the DBNGP to be operated. Additionally, Pipeline Licence 38 has been issued to allow the operation of the Burrup Extension Pipeline (BEP) which is connected to the DBNGP.

The *Petroleum Pipelines (Environment) Regulations 2012* (the Regulations) require the development and implementation of an Environment Plan (EP) to the satisfaction of the Department of Environment, Mines, Industry Regulation and Safety (DEMIRS). The DBNGP Environment Plan (DBNGP EP) has been prepared to collectively satisfy this requirement for each of PL 38, 40, 41, 47, 62, 69, 91, 94, 95, 100, 101 and 123.

Under Regulation 6 of the Regulations, DBP acknowledges that it is an offence to carry out activities without approved EP. An EP may be submitted for each stage of an activity. Alternatively, an EP may cover multiple stages of an activity and/or may incorporate multiple repetitive activities where they are:

- Carried out by the same operator.
- Located in the same geographical area (having the same/similar environmental values and significance).
- Of the same nature (such as a multiple well drilling program).

1.2 Proponent

The Pipeline Licences for the DBNGP and other connected pipelines have been issued to various instrument holders, each of whom have nominated DBNGP (WA) Transmission Pty Limited as the Operator.

1.3 3.Location

The DBNGP is a buried pipeline that transports natural gas approximately 1,400km from the Burrup Peninsula, starting near the township of Dampier, running parallel to the west coast of Western Australia and finishing near Bunbury. Figure 2-1 provides an overview of the route traversed by the DBNGP. The distribution of compressor stations (CS) and main line valves (MLV) along the pipeline is shown in Figure 1 also. Appendix A provides locality coordinates.

2. EXISTING ENVIRONMENT

The objective of this section is to provide a description of the existing environment that may be affected by the DBNGP. Due to the long and linear nature of the DBNGP, the infrastructure spans a wide range of natural, socioeconomic and cultural environments. Each of the sections below break down the key regions that the DBNGP traverses and provide an overview of the key values and sensitivities associated with each, as determined by the Environmental Risk Assessment (ERA) (Section 4).

2.1 Natural Environment

The DBNGP extends through the following 6 bio-geographical regions, Figure 2-1 provides a spatial representation of the biogeographical regions that the DBNGP traverses, which are summarised below:

- Pilbara Region;
- Carnarvon Region;
- Gascoyne Region;
- Yalgoo Region;
- Geraldton Sandplains Region;
- Swan Coastal Plains Region; and
- Jarrah Forrest Region.

Flora and fauna surveys are conducted regularly by DBNGP.

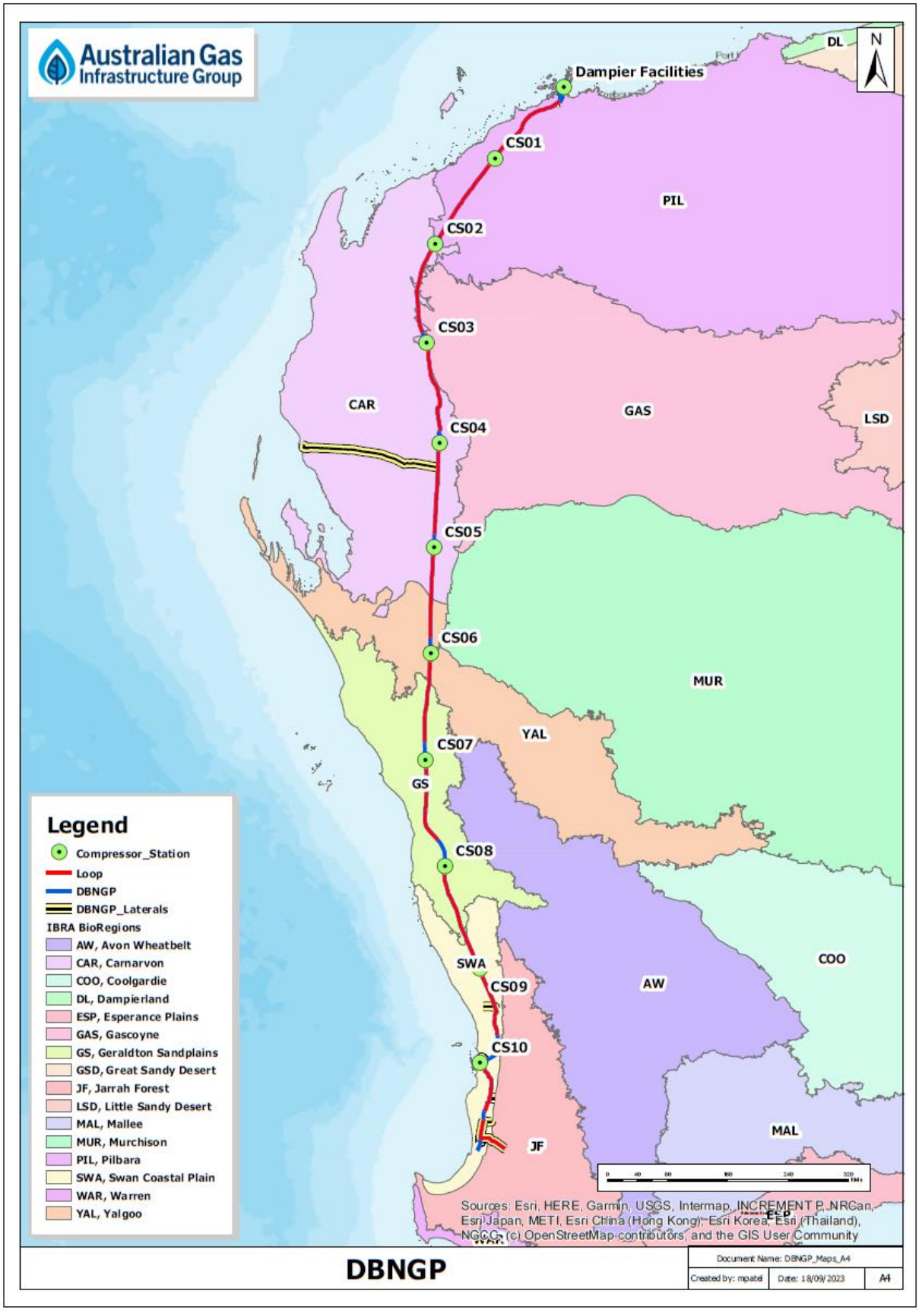

Figure 2-1: Biogeographical regions traversed by the DBNGP

2.1.1 Pilbara Region

Climate

The Pilbara Region has an arid climate with summer rainfall that is strongly influenced by tropical cyclones. The mean annual rainfall in Karratha Aero (site number 004083) is 289.0 mm (BOM 2023). Mean maximum temperatures range from 26.5°C to 36.2°C. Mean minimum temperatures range from 13.9°C to 26.9°C (BOM 2023).

Geology

The Pilbara Region consists of mountainous ranges and plateaus, alluvial plains, granite and basalt plains (LAWA 2001). The bioregion can be divided into three geographic sub-regions:

- Plateaus and Tableland;
- Coastal Plain including mudflats; and
- Transitional Zone

The soils on the banks of watercourses in these sub-regions have been identified as having high erosion potential when exposed to water (Dames and Moore 2000).

Flora

The DBNGP within the Pilbara Region is located within the Fortescue Botanical District of the Eremaean Botanical Province as defined by Beard (1975). The vegetation of this area is characterised by tree and shrub-steppe communities. Dominant genera of the area are *Eucalyptus, Acacia* and *Triodia* (Mattiske, 2006).

Based on publicly available information, there is one species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Pilbara Bioregion. A survey conducted in 2019 confirmed that *Ryhnchosia bungarensis* (P4) and *Terminalia supranitifolia*, (P3) were located within the pipeline corridor near KP1 through to KP9 with multiple small populations found (Astron 2019 and Mattiske, 2014).

Floristic aspects of three Priority Ecological Communities (PEC) are inferred to occur within the DBNGP pipeline corridor between KP 0 and 85, namely 'Roebourne Plains coastal grasslands with gilgai microrelief on deep cracking clays (P1)', 'Tanpool Land System (P1)' and 'Horseflat Land System of the Roebourne Plain (P3)' (Mattiske, 2014).

Fauna

Bancroft and Bamford (2006) conducted a Level 1 fauna survey of the entire pipeline corridor in accordance with EPA Position Statement No. 3 (Bancroft and Bamford 2006). A total of 51 species of conservation significance were identified as potentially occurring within the Pastoral region of the DBNGP corridor (i.e. Pilbara, Carnarvon, Gascoyne, Yalgoo and a portion of the Geraldton Sandplains). A NatureMap (DBCA) review was also conducted in 2020 with the combined list of species below:

- Gilled Slender Blue-tongue
- Fortescue Grunter
- Western Spiny-tailed Skink
- *Lerista lineata*
- Woma
- *Lerista planiventralis maryani*
- Pilbara Olive Python
- *Lerista yuna*
- Carpet Python
- Grey Falcon

- Malleefowl
- Australian Bustard
- Great Egret
- Bush Stone-curlew
- Glossy Ibis
- Barking Owl
- White-bellied Sea-Eagle
- Thick-billed Grasswren
- Peregrine Falcon
- Rufous Fieldwren
- Little Curlew
- Slender-billed Thornbill
- Common Greenshank
- White-browed Babbler
- Wood Sandpiper
- Crested Bellbird
- Common Sandpiper
- Spectacled Hare-wallaby
- Red-necked Stint
- Tammar
- Sharp-tailed Sandpiper
- Ghost Bat
- Curlew Sandpiper
- Northern Short-tailed Mouse
- Oriental Plover
- Western Pebble-mound Mouse
- Oriental Pratincole
- Caspian Tern
- White-winged Black Tern
- Carnaby's Cockatoo
- Major Mitchell's Cockatoo
- Night Parrot
- Fork-tailed Swift
- Rainbow Bee-eater
- Star Finch
- Barn Swallow
- Mulgara
- Northern Quoll
- Bilby
- Black-footed Rock-wallaby
- Orange Leaf-nosed Bat
- Ruddy Turnstone
- Sanderling
- Red Knot
- Long-toed Stint
- Great Knot
- Greater Sand Plover
- Lesser Sand Plover
- Broad-billed Sandpiper
- Bar-tailed Godwit
- Eastern Curlew
- Whimbrel
- Osprey
- Grey Plover
- Little Tern
- Crested Tern
- Grey-tailed Tatter
- Common Greenshank
- Little Greenshank
- Terek Sandpiper

Surface Water

Table 2-1 summarises the major water courses crossed by the DBNGP in the Pilbara bioregion.

Table 2-1: Major Water Courses Crossed by the DBNGP in the Pilbara Bioregion

Major Water Course	KP
Maitland River	37
Melford Creek	45
Yanyare River	47
Devils Creek	57-58
Du Boulay Creek	98
Fortescue River	108
Trevarton Creek	127
Peter's Creek	138
Robe River North	152
Robe River South	153
Warramboo Creek	166
Peedamulla Creek	183
Cane River	210
Peepingee Creek	264

Ground Water

Groundwater is available mainly from unconfined aquifers at shallow depths which are dependent upon rainfall. The depth of the water table on the alluvial plain in between 4 – 10 m. The water quality and quantity is generally quite good and improves with proximity to the hills and drainage channels where subsurface flows persist throughout the year (Payne & Tille, 1992).

Conservation Estate

Cane River Station (a C class Conservation Park) lies adjacent to the DBNGP corridor between KP 208 and KP 262 (inclusive of former leasehold areas proposed for conservation). It should be noted that the DBNGP corridor is excised from this reserve. Nevertheless, the adjacent area is still classified as "of conservation value" for the purpose of operational activities.

The proposed extension of Loop 1 by 16.5 kms to Compressor Station 2 included a flora, vegetation and fauna survey and a hydrology desktop survey conducted in May 2021. All works will be contained with the existing disturbed corridor. The setting for the works includes a water crossing (Peepingee Creek) and vegetation clearing in the area. The survey did not identify any conservation flora species.

2.1.2 Carnarvon Region

Climate

The coastal areas of the Carnarvon Region experience a semi-desert climate with winter rainfall while the Shark Bay area has a Mediterranean climate. Further inland the climate is arid with low rainfall which is predominantly received in the winter. The mean annual rainfall in Carnarvon Airport (site number 006011) is 221.1 mm (BOM 2023). Mean maximum temperatures range from 22.3°C to 32.5°C. Mean minimum temperatures range from 10.9°C to 23.4°C (BOM 2023).

Geology

The Carnarvon Region is characterised by low gently undulating relief and open drainage and large undulating sand plains (ECOS 2003). The geomorphic districts of the bioregion that the DBNGP passes through can be grouped into the following six areas based on soil and relief characteristics:

- Depositional surfaces predominating Aeolian forms;
- Erosional surfaces predominating forms of low relief (plains with relief of <30m);
- Forms of moderate relief (plains and hills with relied 30m to >100m);
- Forms of marked relief (hills with relief >100m);
- Fluvial forms; and
- Lacustrine and marine forms.

The soils of the Carnarvon system are erodible and disperse readily when they come into contact with water.

Flora

Classified as the Carnarvon Botanical District as defined by Beard (1975). Dominant genera are *Acacia* and *Triodia* with occurrences of species from the *Chenopodiaceae* (Chenopods) family such as *Halosarcia*, *Atriplex* and *Maireana* on flats and claypans. The vegetation of the area is varied and is dominated by *Acacia* in the south and changes to *Triodia* dominated in the north.

Based on publicly available information, there are no species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Carnarvon Bioregion.

Fauna

A summary of the fauna species likely to occur within the entire pastoral region (inclusive of the Carnarvon Bioregion) is provided under Section 2.1.1.

Surface Water

Table 3-2 summarises the major water courses crossed by the DBNGP in the Carnarvon bioregion.

Table 2-2: Major Water Courses Crossed by the DBNGP in the Carnarvon Bioregion

Major Water course	KP
Ashburton River	275
Minilya River South	449
Newman Creek	495
Lyons River	534
Davis Creek	553
Gascoyne River	568
Gascoyne River South	569
Wooramel River	651

Ground Water

Groundwater in the region is generally found in the sedimentary rocks of the basin and is fed from rainfall in the region. There are three basins in the region:

- **Western Carnarvon Basin:** coastal lowland rising 100m above sea-level. Unconfined groundwater occurs in the surficial sediments and artesian water occurs in underlying Cretaceous sediments. Groundwater is generally available from 0-30m. Fresh water usually overlies very saline water. Artesian groundwater is primarily found in the Birdsong Sandstone and averages 30m in thickness. The water is brackish to very saline and is corrosive.
- **Eastern Carnarvon Basin:** dissected upland rising 300m above sea-level. Unconfined groundwater, ranging from near surface to 100m occurs throughout the basin. Artesian groundwater occurs in some sandstones and springs, located on faults, are a feature of the region. Fresh groundwater is restricted to areas of outcrops or along major rivers. Elsewhere the groundwater is generally brackish to saline**.**
- **Gascoyne** Province: irregular relief about 300m above sea-level. Unconfined groundwater at depths down to 20m occur. Groundwater occurs within fractures within the rocks and salinity ranges from marginal to brackish (Payne et al. 1987).

Conservation Estate

The Toolonga Nature Reserve (a C Class Nature Reserve) lies adjacent to the DBNGP corridor between KP 746 and KP 818, spanning the Carnarvon and Yalgoo bioregions. It should be noted that the DBNGP corridor is excised from this reserve. Nevertheless, the adjacent area is still classified as "of conservation value" for the purpose of operational activities.

2.1.3 Gascoyne Region

Climate

The region experiences a moderate arid tropical climate with very hot summers and warm winters. Rainfall is erratic and unreliable (LAWA 2001). The majority of the rainfall occurs as a result of cyclonic activity and hence varies considerably but rainfall can be received as both summer and winter rainfall (Beard 1976, GDB 2003).

The mean annual rainfall in Gascoyne Junction (Site number 006022) is 210.9 mm (BOM 2023). Mean maximum temperatures range from 23.0°C to 40.7°C. Mean minimum temperatures range from 9.3°C to 24.4°C (BOM 2023).

Geology

The Gascoyne region has moderately high relief, a close dendritic drainage pattern and mature valley topography (Payne et al 1987). The region is characterised by low rugged sedimentary and granite ranges and broad flat valleys and includes the drainage basins of the Wooramel, Gascoyne, Lyons, Minilya, Lyndon and Ashburton Rivers (LAWA 2001, GDB 2003).

Soils in the bioregion include shallow stony earthy loams, hard alkaline red soils, acidic or neutral shallow red earths, brown calcareous loams and red sands (Beard 1976).

Flora

The region is dominated by acacia shrublands and acacia forests and woodlands. Other shrublands and acacia open woodlands, salt lakes, and chenopod and samphire shrublands occur in the west (LAWA 2001).

The vegetation associations and regions identified in the western area of the Gascoyne bioregion, crossed by the DBNGP alignment, can be divided into three broad associations. These associations are:

- Gascoyne Ranges - the ranges, hills and plains of this sub-region are dominated by low Acacia woodland with a mixture of understorey species including *Eremophila* and *Cassia* species. The river flood plains carry dense marginal vegetation in which *Eucalyptus camalulensis* and Acacia species are found. The small sandplains are vegetated in the west with Acacia scrub and with hummock grassland and *Eucalyptus gamophylla* scrub in the east.
- Carnegie Salient - the vegetation in this sub-region is predominantly covered with a low mulga woodland. Samphire communities, composed of a Frankenia-Atriplex community are present in the lower wetter pans.
- Yinnietharra Hills - the vegetation in this sub-region is dominated by low Acacia scrub with a variety of shrubs and annual grasses and forbs forming a generally sparse understorey (Beard 1976).

Based on publicly available information, there are no species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Gascoyne Bioregion.

Fauna

A summary of the fauna species likely to occur within the entire pastoral region (inclusive of the Gascoyne Bioregion) is provided under Section 3.1.1.

Surface Water

Table 3-3 summarises the major water courses crossed by the DBNGP in the Gascoyne bioregion.

Table 2-3: Major Water Courses Crossed by the DBNGP in the Gascoyne Bioregion

Major Water Course	KP
Yannarie	339
Lyndon River	400
Monkey Creek North	405
Monkey Creek South	406
Minilya River North	432

Ground Water

Numerous rivers drain the Gascoyne region. Due to their ephemeral nature these rivers are usually dry with the exception of a few permanent waterholes however the Gascoyne River occasionally flows between February and August, recharging local aquifers within the riverbed (GDC 2003).

Conservation Estate

There are no areas of conservation estate that intersect the DBNGP corridor within the Gascoyne Bioregion.

2.1.4 Yalgoo Region

Climate

The climate varies from semi-desert to Mediterranean with hot dry summers and mild winters with winter rainfall (LAWA 2001). Average annual rainfall is 225-300 mm (Beard 1976).

The mean annual rainfall in Yalgoo (Site number 007091) is 259.6 mm (BOM 2023). Mean maximum temperatures range from 18.2°C to 37.2°C. Mean minimum temperatures range from 6.2°C to 20.7°C (BOM 2023).

Geology

This region is characterised by sand and alluvial plains, lateritic breakaways, low ranges and saltlakes. Broad alluvial valleys separate the breakaways and low ranges (LAWA 2001).

The soils of this bioregion are quite varied and include the following units:

- Shallow loams on hilly areas with rock outcrops.
- Sandplain and sandy upland soils comprising acidic yellow earths containing ironstone, shallow yellow earthy sands and ironstone gravely forms in association with shallow red earthy sands and shallow red earths.
- Shallow earthy loams and red earths overlying red-brown hardpan on topography from ranges to plains.
- Neutral and acidic red earths over hardpan on plains and flanking slopes.
- Shallow acidic or neutral red earths with shallow earthy loams, overlaying hardpan, on plains with surface gravel.
- Alkaline, neutral or acidic red earths on plains with extensive playa lakes and flanking dunes.
- Saline soils of valleys and salt lakes (Beard 1976).

Flora

The vegetation in the region is dominated by acacia shrublands, acacia forests and woodlands, hummock grasslands and smaller areas of Eucalypt woodlands and chenopod shrublands and samphire shrublands (LAWA 2001).

The stony hills and low-lying plains of this bioregion are dominated by acacia dominated scrub mixed with a variety of undershrubs. The winter rainfall results in strong annual growth of a variety of ephemeral species. In the south of this region there is a distinctive area that is comprised of heath on granite outcrops, acacia scrub on the shallow soils on the higher ground, *Acacia-Melaluca* thickets on the middle slopes, and *Acacia ramulosa* scrub with scattered eucalypts and cypress pines in the valleys.

The chain of salt flats and lakes from Lake Monger to Lake Nullewa are surrounded by samphire, teatree and *Acacia-Eremophila* scrub (Beard 1976).

Based on publicly available information, there are no species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Yalgoo Bioregion.

Fauna

A summary of the fauna species likely to occur within the entire pastoral region (inclusive of the Yalgoo Bioregion) is provided under Section 2.1.1.

Surface Water

Due to the low and erratic rainfall of the region there is little or no surface water. There are numerous salt lakes present in the region.

The only major watercourse crossed by the DBNGP in the Yalgoo bioregion is the Murchison River at KP 845.

Ground Water

Groundwater occurs throughout the bioregion although the water table is sometimes absent in high areas where rock fractures are poorly developed on the fractured rock zone is unsaturated. Water quality ranges from fresh to brackish and is generally encountered within 10m of the surface (Payne et al 1998).

Conservation Estate

The Toolonga Nature Reserve (a C Class Nature Reserve) lies adjacent to the DBNGP corridor between KP 746 and KP 818, spanning the Carnarvon and Yalgoo bioregions. It should be noted that the DBNGP corridor is excised from this reserve. Nevertheless, the adjacent area is still classified as "of conservation value" for the purpose of operational activities.

2.1.5 Geraldton Sandplains Region

Climate

The coastal climate is Mediterranean with mild wet winters and hot dry summers. Inland areas experience semi-desert arid climate with low un-seasonal rainfall, hot dry summers and mild dry winters. A semi-arid climate is transitional between the two. The great variation in rainfall, from north to south, results in considerable variation in vegetation and land use (LAWA 2001).

Rainfall decreases in a northerly and easterly direction. Most coastal areas receive an average 400 - 500 mm of rainfall per year while inland areas can expect less than 250 mm. Rainfall in inland areas tends to be more erratic and unreliable (MWDC 2003). Annual evaporation in the region averages 2000-2800 mm (BOM 2023).

Mean maximum temperatures at Geraldton Airport (Site number 008051) range from 19.6°C to 32.6°C (BOM 2023). Mean minimum temperatures range from 8.9°C to 19.2°C (BOM 2023).

Geology

The Geraldton bioregion consists of undulating lateritic red sand plains overlaying sediments and gravels or cap-rock (LAWA 2001).

The bioregion includes a diversity of geographic features. Ranges include the flat-topped Moresby Ranges near Geraldton, the Weld, Nicholas, Dividing, Montague, and Robinson ranges. However, these are minor and with a few other exceptions including the dissected Northampton Block and small areas of breakaway country, the region tends to be relatively flat.

With the exception of the laterite breakaways land systems the soils in this region, which are characterised by loose sandy surfaces, are prone to wind erosion (Dames & Moore 2000) and tend to have a high erosion potential.

Flora

Twenty-nine different vegetation systems have been identified within the Geraldton bioregion reflecting the influences of the high winter rainfall and soils in the region (Beard 1976).

Areas in the region that have been cleared are susceptible to wind and water erosion and many areas suffer from land degradation from spread of weeds, uncontrolled fire and overgrazing by introduced pests such as feral goats, foxes and rabbits (WA Planning Commission 1999).

The plant disease Dieback (*Phytophthora cinnamomi*) occurs in this bioregion. This fungal pathogen is soil borne and kills susceptible vegetation by killing root and tissue cells. Native vegetation in this area is susceptible to Dieback, which is spread by either soil or water, and management measures are required to prevent its spread. Dieback management plans are required for those areas either known to contain the disease or with the potential to be infected by the disease for adjoining areas (Epic 1999).

Based on publicly available information, there are two species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Pilbara Bioregion.

Grevillea florida (P3) is located in the vicinity of KP 1143. *Eucalyptus ebbanoensis subsp. Photina* (P4) is located in the vicinity of KP 1027.

A survey conducted (ELA 2014) along the pipeline corridor identified nine priority species in this sub-region including:

- *Dicrastylis linearifolia, Hemiandra sp. Mesomelaena sygia subsp. deflexa and Lepidobolus quadtratus* (all Priority 3)
- *Banksia chamaephyton, Banksia scabrella, Caulytrix chrysantha, Eucalyptus macrocarpa subsp elachantha and Hypolaena robusta* (Priority 4).

A NatureMap review in 2020 identified the following potential threatened flora species that could also occur near the pipeline corridor:

- *Leucopogon marginatus, Acacia anomala, Diuris drummondii, Glyceria drummondii, Grevillea althoferorum subsp. fragilis, Spirogardnera rubscens.*

Fauna

Bancroft and Bamford (2006) conducted a Level 1 fauna survey of the entire pipeline corridor in accordance with EPA Position Statement No. 3 (Bancroft and Bamford 2006). A total of 47 species of conservation significance were identified as potentially occurring within the Agricultural region of the DBNGP corridor (i.e. Geraldton Sandplains and portion of Swan Coastal Plains). A NatureMap (DBCA) review was also conducted in 2020 and the combined species list is below:

- Western Swamp Tortoise
- Jewelled Ctenotus
- Gilled Slender Blue-tongue
- *Lerista lineata*
- Western Spiny-tailed Skink
- *Lerista yuna*
- Woma
- Black-striped Snake
- Carpet Python
- Black Bittern
- Malleefowl
- Australasian Bittern
- Great Egret
- Australian Bustard
- Cattle Egret
- Bush Stone-curlew
- Glossy Ibis
- Barking Owl

- White-bellied Sea-Eagle
- Shy Heathwren
- Peregrine Falcon
- Rufous Fieldwren
- Common Greenshank
- Slender-billed Thornbill
- Wood Sandpiper
- White-browed Babbler
- Common Sandpiper
- Crested Bellbird
- Red-necked Stint
- Brush-tailed Phascogale
- Sharp-tailed Sandpiper
- Quenda
- Curlew Sandpiper
- Tammar
- Hooded Plover
- Brush Wallaby
- Caspian Tern
- Water-rat
- White-winged Black Tern
- Carnaby's Cockatoo
- Baudin's Cockatoo
- Major Mitchell's Cockatoo
- Fork-tailed Swift
- Rainbow Bee-eater
- Chuditch
- Black-footed Rock-wallaby
- Western Ringtail Possum
- White-tailed Black Cockatoo

Surface Water

Table 2-4 summarises the major water courses crossed by the DBNGP in the Geraldton Sandplains bioregion.

Table 2-4: Major Water Courses Crossed by the DBNGP in the Geraldton Sandplains Bioregion

Major Water Course	KP
Greenough River	962
Irwin River	1036
Arrowsmith River	1080
Donkey Creek	1086
Flood Creek	1095
Boothendarra Creek	553
Hill River	568
Mullering Brook	569
Milyulo Brook (north)	651

Ground Water

The relatively low rainfall of the region makes groundwater resources extremely valuable. Generally, groundwater is available throughout the region with southern coastal areas having access to higher yields and quality. The quality and quantity of groundwater in inland areas and other areas such as the Northampton Block varies (MWDC 2003).

Conservation Estate

Table 2-5 summarises the conservation estates intersected by the DBNGP in the Geraldton Sandplains bioregion. It should be noted that the DBNGP corridor has been excised from all Conservation Estates listed. Nevertheless, sections of the corridor adjacent to (and intersecting) these reserves are still classified as "of conservation value" for the purpose of operational activities.

Table 2-5: Conservation Estates Intersected by the DBNGP in the Geraldton Sandplains

Conservation Estate	Reserve	KP
Coomallo nature Reserve	C Class Nature Reserve	1150-1154
Hill River Nature Reserve	A Class Nature Reserve	1165-1166
Twyata Nature Reserve	C Class Nature Reserve	1166-1167
Badgingarra National Park	A Class National Park	1169-1174
Minyulo Nature Reserve	A Class Nature Reserve	1201-1203

2.1.6 Swan Coastal Plains Region

Climate

This bioregion experiences a Mediterranean climate with warm dry summers and cool wet winters (LAWA 2001). Rainfall increases with proximity to the western side of the Darling Scarp (Beard 1981).

The mean annual rainfall in Perth Airport is 760.0 mm (BOM 2023). Mean maximum temperatures range from 18.0°C to 32.0°C. Mean minimum temperatures range from 8.1°C to 17.6°C (BOM 2023).

Geology

This region is dominated by a low lying coastal plain (LAWA 2001) and has been divided into seven subunits, six of which are relevant to the DBNGP and which equate to the following soil and vegetation systems:

- Quindalup Dunes - these young coastal dunes are dominated by calcarious sands.
- Spearwood Dunes - these dunes support several permanent lakes and the soils are composed of slightly podzolized yellow sands. This region also includes the Swan and Blackwood River estuaries.
- Bassendean Dunes - low sandhills with numerous interdunal swamps and lakes with leached and podzolized white quartz sands.
- Pinjarra Plain - an alluvial flat between the Bassendean Dunes and Darling Scarp with soils comprising red and yellow podzolics with sandy surfaces.
- Piedmont Zone (Ridge Hill Shelf) - runs along the foot of the Gingin and Darling Scarps and consists of alluvial fans with soils comprising red and yellow podzolics.
- Gingin and Darling Scarps – these steeply rising scarps have soils comprised of acidic red earths on the slopes with red and yellow podzolics on the upper slopes and 14esources14 sands on the spurs and ridges.

Flora

The vegetation in the region is dominated in the south by eucalypt open forests and eucalypt woodlands with small areas of heath, open forests and woodlands, melaleuca forests and woodlands, acacia shrublands and shrublands. In the north large areas of eucalypt open woodlands, other forests and woodlands, heath, acacia shrublands and eucalypt woodlands occur (LAWA 2001).

The vegetation associations of the subunits of the Swan Coastal Plain are described below:

- Bassendean Dunes – the dominant vegetation in this region is a *Banksia* low woodland dominated by *Banksia attenuate, B. menziessii*, *B. ilicifolia*, *Eucalyptus todtiana* and *Nuytsis*

floribunda with a dense understorey of sclerophyll shrubs. North of the Moore River there are patches of heath and the swamps are charaterised by low woodland and forest (including *Melaleuca preissiana*, *M. rhaphiophylla*, *Banksia littoralis*, *Casuarina obesa* and *Eucalyptus rudis*).

- Pinjarra Plain – the dominant vegetation in this region is a *Eucalyptus* woodland. Areas subject to flooding, such as Benger Swamp support low woodland or forest of *Melaleuca rhaphiophylla*, thickets of *M. preissiana* or sedgeland.
- Quindalup Dunes – north of the Swan River vegetation includes low *Callitris preissii* forest, *Acacia* thickets and an *Acacia lasiocarpa – Melaleuca acerose* heath. On the coastal dunes and islands *Callitris preissii* low forest, heath, *Acacia rostellifera* thickets and *Acacia saligna* and *Jacksonia* scrub with numerous *Xanthorrhoea preissii* can be found.
- Spearwood Dunes – the northern portion of this region is characterised by *Eucalyptus gomphocephala* woodlands, heath on shallow soils or ridges and a low *Banksia* woodland on the slopes. The southern portion of this region is characterised by woody communities of *Melaleuca* and *Banksia*, samphires on the margins of the salt lakes, a *eucalypt* woodland (*Eucalyptus gomphocephala* and *E. marginata*) and minor communities of heath, low woodland (with *Melaleuca* and *Banksia*) and low forest.
- Piedmont Zone (Ridge Hill Shelf) – the main vegetation types in this region include Eucalypt Forest (*Eucalyptus marginata* and *E. calophylla*) with *E. wandoo* on the heavier gravel soils and *Casuarina fraserana* on the sandy soils. Streams and creeks are finged by a woodland of *Eucalyptus rudis* and *Melaleuca preissiana* (Beard 1981).

There is very little of the original native vegetation remaining in the Pinjarra system due to extensive clearing undertaken for agricultural purposes.

Based on publicly available information, there are nine species of conservation significant flora known to occur within a 50 m buffer of the DBNGP corridor within the Swan Coastal Plains Bioregion.

Table 2-6 presents the species name, conservation significance and location (via nearest KP) of each. It should be noted that a total of three individual populations of *Conospermum undulatum* have been identified.

Table 2-6: Conservation Significant Flora Known to Occur within the Swan Coastal Plains Bioregion Component of the DBNGP Corridor

Species Name	Conservation Status	KP
Verticordia lindleyi subsp. *lindleyi*	Priority 4	1357, 1362
Isopogon drummondii	Priority 3	1361
Conospermum undulatum	Threatened (Vulnerable)	1361, 1362 and 1363
Diuris purdiei	Threatened (Endangered)	1382
Jacksonia sericea	Priority 4	1382
Drakaea elastica	Threatened (Critical)	1416
Synaphea stenoloba	Threatened (Endangered)	1448
Dillwynia dillwynioides	Priority 3	1510
Acacia semitrullata	Priority 4	1510
Caladenia procera	Threatened (Critical)	1511
Diuris drummondii	Threatened (Endangered)	1513
Boronia juncea subsp. *juncea*	Priority 1	1514

The survey also indicated two locations immediately adjacent to the DBNGP as having floristic elements of the Threatened Ecological Community (TEC); SCP 3a '*Corymbia calophylla – Kingia australis* woodlands on heavy soils of the Swan Coastal Plain'. This community is listed as Critically Endangered (CR) under the state level and Endangered at the Commonwealth level near KP1362 and KP1447-1449 (Mattiske 2014). One Priority Ecological Community (PEC) was identified 'SCP 21c; Low lying *Banksia* woodlands or shrublands' around the DBNGP corridor at KP1414-1417 (Mattiske 2014).

Weeds, Pathogens and Pests

European House Borer (EHB), *Hylotrupes bajulus Linnaeus*, is a destructive pest of seasoned coniferous timber including pine, fir and spruce known to occur at some locations within the Swan Coastal Plain. If allowed to become established, it can cause major structural damage to buildings. The adult beetle lays its eggs into cracks, holes and joints in dead pine trees, dead branches, or other dead parts of living trees and untreated pine timber.

The *Agriculture and Related Resources Protection (European House Borer) Regulations 2006* have set Restricted Movement Zones (RMZ) in specific areas within the Swan Coastal Plain. Movement of untreated pine into or out of these areas is restricted.

Fauna

Bancroft and Bamford (2006) conducted a Level 1 fauna survey of the entire pipeline corridor in accordance with EPA Position Statement No. 3 (Bancroft and Bamford 2006). A total of 40 species of conservation significance were identified as potentially occurring within the Swan Coastal Plains region of the DBNGP corridor. A NatureMap (DBCA) review was undertaken in 2020 and the combined species are listed below:

- Western Swamp Tortoise
- Jewelled Ctenotus
- Woma
- *Lerista lineata*
- Carpet Python
- Black-striped Snake
- Malleefowl
- Black Bittern
- Great Egret
- Australasian Bittern
- Cattle Egret
- Australian Bustard
- Glossy Ibis
- Bush Stone-curlew
- White-bellied Sea-Eagle
- Barking Owl
- Peregrine Falcon
- Rufous Fieldwren
- Common Greenshank
- White-browed Babbler
- Wood Sandpiper
- Crested Bellbird
- Common Sandpiper
- Rainbow Bee-eater
- Chuditch
- Western Ringtail Possum
- Brush-tailed Phascogale
- Red-necked Stint
- Quenda
- Sharp-tailed Sandpiper
- Brush Wallaby
- Curlew Sandpiper
- Water-rat
- Hooded Plover
- Caspian Tern
- White-winged Black Tern
- Carnaby's Cockatoo
- Baudin's Cockatoo
- Major Mitchell's Cockatoo
- Fork-tailed Swift

- Australian Lesser Noddy
- Western Corella
- Forest Red-tailed Black Cockatoo
- White-tailed Black Cockatoo
- Short-tongued bee
- Shield-backed trapdoor spider
- Lined skink
- Southern Giant Petrel
- Blue-billed Duck
- Graceful Sunmoth
- Crested Tern

Surface Water

Table 3-7 summarises the major water courses crossed by the DBNGP in the Swan Coastal Plains bioregion.

Table 2-7: Major Water Courses Crossed by the DBNGP in the Swan Coastal Plains Bioregion

Major Water Course	KP
Caren Caren Brook	1226
Moore River	1241
Red Gully	1254
Gingin Brook	1286
Swan River	1348
Helena River	1349
Canning River	1371
Serpentine River	1415
North Dandalup River	1439
South Dandalup River	1445
Murray River	1457
Harvey River	1482

Wetlands

The corridor traverses numerous conservation category wetlands (CCWs) and wetlands gazetted under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 (EPP Lakes).

Between CS9 and CS10 the pipeline traverses within 200 m of Forrestdale Lake (KP1383-1384.5) and south of CS10 the pipeline runs north-south across the eastern side of the Swan Coastal Plain section of the catchment of the Peel-Harvey Estuary (the estuary is approximately 10 km away from the pipeline route at its closest point) (KP1440 -KP1470). Forrestdale Lake and the Peel-Harvey Estuary are both Ramsar listed wetlands; 'Forrestdale and Thomsons Lakes' and the 'Peel-Yalgorup System' respectively. Both Ramsar wetland systems are identified as wetlands of international importance.

Ground Water

The groundwater in this region ranges in depth from 1m to 10m and occurs mainly in shallow unconfined aquifers. Water quality is around 1000 total dissolved salts mg/ml. The deeper aquifers are of variable water quality, but some do contain potable water (SECWA 1979).

The Bassendean Dunes are an important intake area for coastal pain aquifers and are underlain by fresh groundwater at shallow depths (Beard 1981).

Conservation Estate

Table 2-8 summarises the conservation estates intersected by the DBNGP in the Swan Coastal Plains bioregion. Additionally, the Southern Loop Worsley Lateral intersects the Harris River State Forest (a Class A State Forest) between KP 41 and KP 58. An unnamed parcel vested to CALM is intersected by the DBNGP between KP 1512 – KP1515 and KP 1518 – KP 1521. It should be noted that unlike in all other bioregions, the DBNGP corridor has not been excised from any areas vested for conservation within the Swan Coastal Plains.

Table 2-8: Conservation Estates Intersected by the DBNGP in the Swan Coastal Plains Bioregion

Conservation Estate	Reserve	KP
Gnangara-Moore River State Forest	A Class State Forest	1324-1336
Leda Nature Reserve	A Class Nature Reserve	1404-1407
1943/161	A Class Nature Reserve	1492-1495
Myalup State Forest	A Class State Forest	1501-1506

2.2 Social and Economic

The DBNGP is located within a tract of land called the 'DBNGP corridor' which was established in the early 1980s and formally gazetted under the *Dampier to Bunbury Pipeline Act 1997* (DBP Act). The control of land use within the DBNGP corridor is the responsibility of the DBNGP Land Access Minister. In March 1998, the DBNGP Land Access Minister conferred certain access rights to the Licensee of the DBNGP, issued as an Access Right under Section 34 of the DBP Act. The Access Right is administered by the Department of Planning, Lands and Heritage (DPLH) on behalf of the DBNGP Land Access Minister.

DBP has non-exclusive access rights to the original DBNGP Corridor, which is 30m from Dampier Facilities to Wagerup West, and further reducing to 16m from Wagerup West to MLV159. The laterals that form the pipeline system have pipeline easement widths that vary from 5m to 20m.

DBP pays an annual fee to the DBNGP Land Access Minister for the Access Right.

From a socio-economic perspective, the DBNGP corridor can be divided into three regions based on the predominant land use: the Pastoral Region; Agricultural Region and the Swan Coastal Plain Region. The following section gives a brief description of the Local Government areas traversed by the pipeline.

2.2.1 The Pastoral Region

The pastoral region extends from Dampier in the City of Karratha to the Shire of Northampton. The Local Government Areas (LGAs) traversed by the pipeline in the pastoral region are described in the Table 3-9.

Table 2-9: Local Governments in the Pastoral Region

LGA	Area (km^2)	Popn[1]	Major Towns	Major Industries/ Land Use
Karratha	15,235	22,199	Major Towns: Karratha and Dampier; Ports: Cape Lambert and Dampier.	Iron ore, salt, natural gas, pastoral, fishing, tourism
Ashburton	105,647	7,391	Onslow	Mining, pastoral, fishing, fish processing, oil, tourism, salt
Carnarvon	53,000	5,251	Carnarvon	Fishing, horticulture, salt and gypsum, tourism, pastoralism
Upper Gascoyne	46,602	170	Gascoyne Junction	Mining, pastoral, tourism
Shark Bay	25,000	1,031	Denham	Pastoral, fishing, salt, pearl culturing, shell grit mining, tourism
Northampton	13,513	3,227	Northampton and Kalbarri	Wheat, sheep, fishing, mineral sands mining, tourism

2.2.2 Agricultural Region

The DBNGP runs through 9 LGAs in the Agricultural Region. The details of each of these are provided in Table 2-10.

Table 2-10: Local Governments in the Agricultural Region

LGA	Area (km²)	Popn[1]	Major Towns	Major Industries/ Land Use
Chapman Valley	4,007	1,556	Nabawa	Agricultural primary production, marron farming, viticulture.
Greater Geraldton	12,626	39,489	Mullewa, Geraldton	Mullewa area – Grain, sheep, iron ore mine at Tallering Peak.
Irwin	2,223	3,680	Dongara and Port Denison	Fishing, farming, manufacturing, gas and oil fields, mineral sands mining, tourism, crayfish processing
Three Springs	313	575	Three Springs	Talc mine, grain growing, sheep
Carnamah	2,835	552	Carnamah and Eneabba	Fishing, mineral sands, rock quarrying, agriculture, floriculture, gas production
Coorow	4,137	1,055	Leeman and Green Head	Agriculture, fishing, wildflowers, tourism
Dandaragan	6,934	3,355	Jurien Bay and Dandaragan	Wheat and pastoral farming, mining, tourism
Gingin	3,325	5,576	Gingin	Fishing, cattle/ sheep grazing, horticulture, piggeries, viticulture, market gardening, mineral sands mining
Chittering	1,220	5,930	Muchea, Bindoon and Wannamal.	Mineral sands processing, fruit growing, agriculture, horticulture, tourism, viticulture

2.2.3 Swan Coastal Plain Region

In the Swan Coastal Plain Region, the DBNGP crosses through 11 LGAs as detailed in Table 3-11.

LGA	Area (km²)	Popn[1]	Major Towns	Major Industries/ Land Use
Wanneroo	687	209,111	Within Perth Metropolitan Region	Agriculture, commercial and retail, building construction, light industry, tourism, viticulture.
Swan	1,043	152,974	Within Perth Metropolitan Region	Extractive industry, general industry, retail, rural; viticulture
Belmont	40	42,257	Within Perth Metropolitan Region	Retail, property and business services, manufacturing
Kalamunda	349	58,762	Within Perth Metropolitan Region	Orcharding and intensive horticultural activities, grazing, farming
Gosnells	127	126,376	Within Perth Metropolitan Region	Retail and wholesale service industries, fruit growing, quarrying
Armadale	545	94,184	Within Perth Metropolitan Region	Brickworks, retail, light industry, orchards

LGA	Area (km²)	Popn[1]	Major Towns	Major Industries/ Land Use
Cockburn	148	118,091	Within Perth Metropolitan Region	Ship building, seafood processing, cement/ lime manufacturers, silica processors, tanneries
Kwinana	118	45,867	Within Perth Metropolitan Region	Refineries, LP gas storage, chemical works, nitrogen, fertiliser, power station, sand blasting, engineering, cement works, poultry farming, horticulture, extractive industry, mineral processing
Rockingham	261	135,678	Within Perth Metropolitan Region	Grain silos, nickel refinery, light industry, crayfishing, fishing; farming, forestry, market gardening, horticulture
Serpentine-Jarrahdale	905	32,173	Within Perth Metropolitan Region	Equine, farming, brickworks, timber mills, wineries
Murray	86	18,068	Pinjarra	Alumina refinery, light industrial area, dairy and beef cattle, piggeries, forestry, fishing, wineries
Waroona	835	4,234	Waroona	Dairying, whole milk, tourism, timber, vegetables, forestry, beef, sheep, earthmoving, mining, mineral sands, Wagerup Alumina Refinery
Harvey	1,766	28,567	Harvey	Dairy, beef, horticulture, mining, vineyards, export beef abattoir, silicon smelter, pigment plant, light engineering
Collie	1,685	8,812	Collie	Muja Power Station, Collie Power Station, Worsley Bauxite Refinery, coal mining, timber, farming; tourism, aquaculture, viticulture

2.3 Cultural Environment

Searches of the Register of Aboriginal Sites, which is maintained by the DIA, indicated that over 200 archaeological and ethnographic sites have been recorded along or within 100 m either side of the pipeline corridor. These sites are comprised mostly of artefacts/scatters, which refers to locations where a range of activities has occurred such as the manufacture and maintenance of tools and the processing of foods. A small number of sites consist of grinding patches/grooves, quarries, modified trees, and man-made structures.

A number of heritage evaluations of the pipeline corridor have been undertaken in the past. These include the West Australian Museum's initial archaeological survey of the pipeline route¸ the secondary archaeological survey of the original pipeline corridor (Pickering, 1982) and the archaeological survey of the corridor expansion (McDonald, Hales and Associates 2001a). Heritage surveys were also undertaken as part of the Stage 4, 5A and 5B expansion works on the DBNGP in 2005-2011.

All archaeological sites have been salvaged and relocated outside the previously disturbed section of the DBNGP corridor. However, there are ethnographic sites located within the previously disturbed section of the DBNGP corridor, all of which are waterways.

No European heritage sites are listed by the Heritage Council of Western Australia or the National Trust of Australia as occurring within the entire pipeline corridor (Dames and Moore 2000; BBG

2004). A number of sites along the corridor are listed by the Australian Heritage Commission including the Coomallo Nature Reserve, Badgingarra National Park and Burma Road Nature Reserve. In addition, no sites listed on municipal heritage inventories maintained by the separate local government authorities occur in the pipeline corridor (Dames and Moore 2000; BBG 2004).

Heritage agreements are assigned to the DBNGP Lands Access Minister under Section 32 of the Dampier to DBP Act.

3. ACTIVITY DESCRIPTION

The DBNGP transports natural gas approximately 1,600km from the Burrup Peninsula, starting near the township of Dampier, running parallel to the west coast of Western Australia and finishing near Bunbury. The DBNGP has twelve loops (Loops 0 to 10 and the South West Loop) and seventeen laterals (branch pipelines) along its length. It also has 10 mainline compressor stations (CS) and Pluto Interconnect Compressor Station which is installed with a reciprocating compressor package. The mainline compressor stations are equipped with between one to four compressor units and associated facilities located on or along the pipeline, such as meter stations, mainline valves (MLVs) and communication equipment.

The DBNGP has Transportation Services Control Centre (TSCC) and Head Office located at 140 St Georges Terrace in the Perth CBD and an Operations complex located at Jandakot. The DBNGP employs hundreds of contractors for various petroleum activities.

A summary description of the DBNGP is below:

- Natural gas from suppliers enters the DBNGP at Burrup Peninsula (North West Shelf Gas and Woodside Pluto), BEP Interconnect, MLV 7 Interconnect, Maitland (Santos Devil Creek), CS1 (Santos Varanus Island), Gorgon, Macedon, Wheatstone and Tubridgi Gas Storage (via AGIG's Ashburton West Pipeline systems), Dongara (Mondarra Storage Facility – bidirectional), Dongara (Waitsia) and Gingin (Red Gully – *currently suspended*).
- The gas is cooled at Dampier Facilities and at all mainline Compressor Stations (except Pluto), primarily to minimise potential for the formation of stress corrosion cracking.
- The gas passes through Mainline Valves (MLVs) the primary function of which is to allow isolation of a section or sections of the DBNGP for emergency response purposes as well as for maintenance. These sites contain communication infrastructures and facilities for generation and storage of power on site to service the MLVs.
- The gas pressure reduces as it travels down the pipeline, due to friction loss. The pressure of the gas is raised through gas turbine driven compressors at mainline Compressor Stations, which are spaced approximately 150km apart.
- The gas is delivered to shippers through outlet meter stations. The Meter Stations generally comprise of duty and standby meter runs and may contain equipment to reduce pressure, heat the gas and/or odorise the gas before delivery to the Shippers. There are 62 customer Meter Stations on the DBNGP, of which 53 are operational while 9 are currently not in use.
- Odorisation is undertaken at some of the Meter Stations depending on the customer requirements. Bulk odorisation to industrial standard is undertaken at the DBNGP WLPG facility located in Kwinana for all gas delivered into the Kwinana and the pipeline South segments. Further odorisation of gas occurs at some Meter Stations to increase the level to the residential standard, depending on the downstream gas consumers.
- The pipeline is remotely operated through the Supervisor Control and Data Acquisition (SCADA) system from TSCC. The microwave communications system in the areas north of Perth provides the backbone for the SCADA system as well as connection for other digital communications systems. Communications system for sites south of Perth largely consists of fibre optic, pilot cable, UHF radio and public cellular networks.

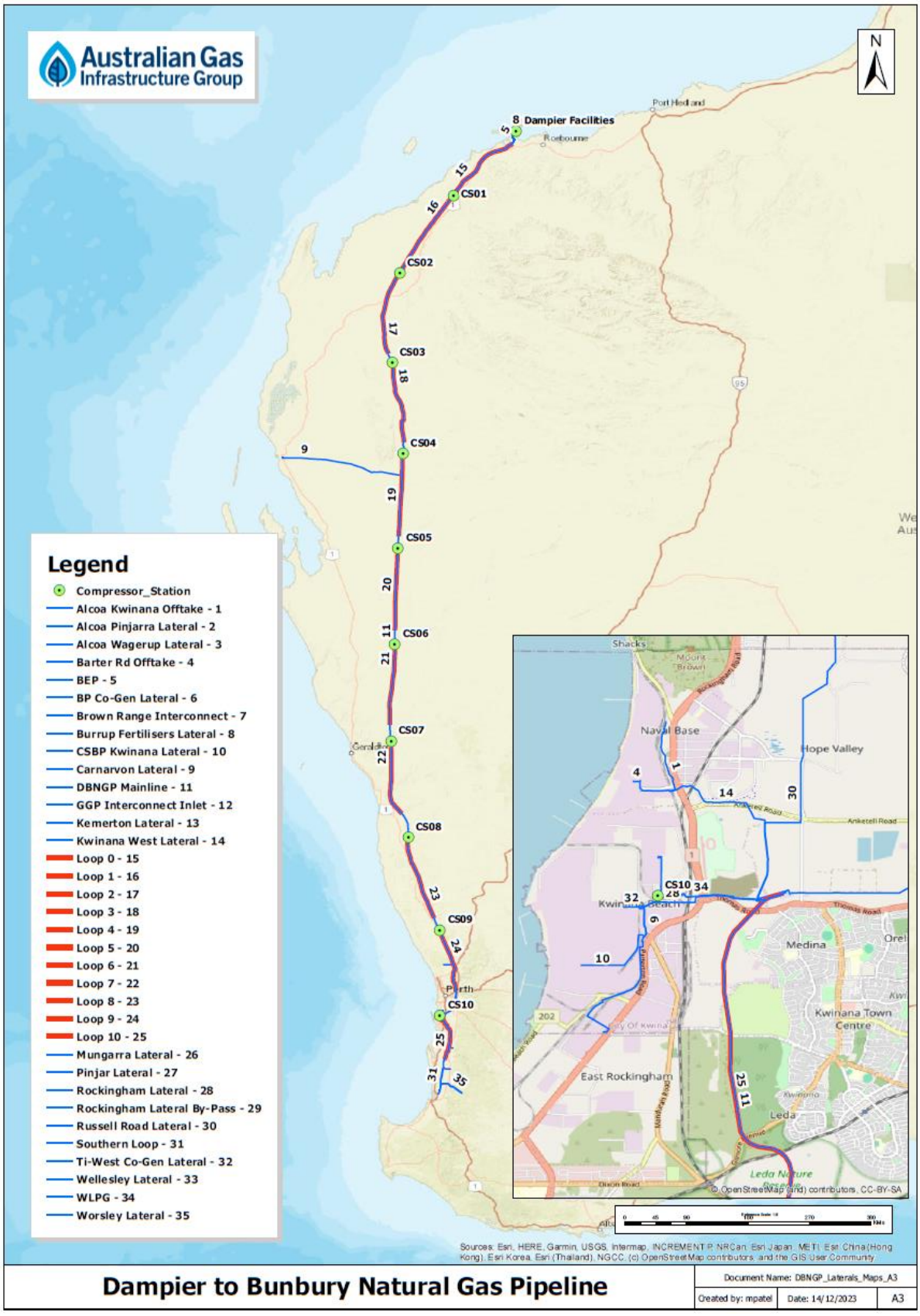

Figure 3-1: Overview of the DBNGP

4. ENVIRONMENTAL RISK IDENTIFICATION AND ASSESSMENT

DBP is committed to the effective management of risk as part of its Corporate Governance program and as such has defined and endorsed a Risk Management Policy. The DBP Risk Management Policy makes a commitment to ensure that:

- Systems are in place to identify (as far as reasonably practicable) risks that DBP faces in conducting its business.
- The impact of identified risks is understood.
- Risk treatment owners are nominated to manage the identified risks.
- Assurance is provided on the effectiveness of the risk management system and risk controls.

It is DBP's responsibility to conduct an Environment Risk Assessment (ERA) to ensure commitments are met and environmental impacts and risks arising from DBNGP activities are identified and reduced to As Low as Reasonably Possible (ALARP) and acceptable levels. The ERA is continuously reviewed and updated to ensure information is maintained and up-to-date.

In a workshop held 15th March 2018, a comprehensive Environmental Risk Assessment (ERA) was completed to review the existing DBNGP Environmental Aspects and Impacts Register. The ERA was conducted by a multidisciplinary team of in-house personnel (including but not limited to the Senior HSE Advisor, Manager Asset Strategy, and Operations Representatives) and followed a structured process which sought to:

- Outline key activities undertaken on the DBNGP;
- Identify any new risks;
- Analyse and evaluate associated hazards and corresponding environmental impacts;
- Incorporate risks from the Minor Project Construction EP;
- Where necessary, establish suitable controls; and
- Systematically assess the residual associated environmental risk.

An updated Environmental Aspects and Impacts Risk Register was developed for the key activities undertaken on the DBNGP following the workshop.

The ERA was reviewed by a multidisciplinary team including the Senior HSE Advisor in June 2020 as part of this update. Minor changes were made to confirm the existing risks and controls in place. An additional risk assessment was completed in February and March 2023, including a site visit and review for the addition of the Burrup Fertilisers Lateral. This included a multidisciplinary team to ensure review of impacts and current controls and the application of DBP controls. No additional impacts to the environment were identified through the process.

An additional review of the overall ERA was conducted in a workshop held 18 August 2023 by the transmission operations, transmission asset management, land management, GIS and HSE teams. No additional impacts to the environment were identified through the process.

In November 2023 by in-house personnel (including the Environment Manager and Senior Environment Advisor) and an external consultant. Existing risks and controls were tested and updates made where required this includes:

- Identification of additional DBNGP activities.
- Consideration of site-specific biogeographical conditions.
- Revision of Environmental impacts to reflect current operations.

- Controls were further classified into key categories which includes preventive, detection, and corrective/mitigating.
- For each activity specific risk, risk owners were identified.
- ALARP assessment and Cost Benefit Analysis for each environmental risk ID.

5. IMPLEMENTATION STRATEGY

Within each interaction subgroup, each group of impacts and risks has been addressed with an objective to:

- Define the environmental performance objectives that will be required to be achieved in order to ensure environmental protection;
- Define the environmental performance standards that relate to the quality of the performance; and
- Define the measurement criteria for determining whether the objectives and standards have been met for the activity.

Specific control measures have been developed to direct, review and manage activities so that environmental impacts and risks are continually being reduced to ALARP. Each control measure has been assigned a role within the organisation to be responsible for its implementation with a summary of these controls outlined below.

- Soils and Sediment
  - Erosion management
  - Native Vegetation Clearing procedure conditions
  - Acid sulphate soil (ASS) management (limited interaction with any identified ASS sites onsite)
- Flora
  - Native Vegetaiton Clearing procedures
  - Clearing Permit and approval conditions
- Weeds and Pathogens
  - Targeted and frequent weed management
  - Declared weeds management in conjunction with pastoral leasees
  - Clean on Entry procedure
  - Stick to existing tracks
- Bushfire
  - Management of hot works and potential fire risk under Permits
  - Management of flammable material build up
  - Firebreaks and management of ignition sources
  - Prohibited items in hazardous areas
  - Hot Works procedure conditions including compliance with bushfire regulations
- Fauna
  - Trench management
  - Fauna controls including egress and fences
  - Fauna handling training
  - Frequest inspections
  - Waste management (lidded bins, frequent servicing)

- Cultural Heritage and Stakeholder Enagamet
  - Consultuation with Traditional Owners
  - Surveys for planned disturbance areas
  - Registered sites reviews (GIS)
  - Minimum annual consultation on activities and planned interactions
  - Local council communication and consultation (especially in relation to road closures)
- Dust and Air Emissions
  - Minimise dust generated through activities
  - Stabilise stockpiles including dust suppression
  - Minimise emissions through design and efficient operations
  - Monitor ongoing emissions
- Noise
  - As per approval conditions
  - Minimise noise during operations
- Surface and Ground Water
  - Abstraction under licensed approval conditions only
  - Management of evaporation pond (dual lined with leak detection)
  - Management of chemicals (as per below) to avoid contamination
- Hazardous Materials Storage and Handling
  - Bunded areas for liquid storage
  - Capture or removal of contaminated material (i.e. soil)
  - Minimise chemical storage onsite
- Waste
  - Frequent servicing and provision of bins
  - Waste segregation
  - Labelled (all) and lidded (general and co-mingled)
- Rehabilitation
  - Rehabilitation criteria (short and long term)
  - Ongoing monitoring until criteria met
  - Prohibit access to rehabilitation areas

6. MONITORING

To monitor the effectiveness of control measures in the management of the environmental impacts and risks, targeted monitoring commitments have been specified where relevant. DBP conducts regular surveillance of the DBNGP corridor to ensure that the integrity of the DBNGP is maintained. These patrols are conducted by 4WD, helicopter or fixed-wing aircraft and by foot with an objective to detect:

- Third party encroachments
- Erosion and changing landforms
- Damaged or missing signage
- Vegetation overgrowth and clearing
- Damaged or missing gates and fences
- Changes in location class
- Indications of gas leaks
- Impediments to and condition of access roads
- Security violations
- Weed infestation
- Water quality and protection of natural flows
- Any other issues of significance to the integrity of the corridor

The DBNGP is subject to an annual environmental compliance review to ensure that the systems and controls detailed within this EP are both adequate and implemented, and also identify opportunities for improvement. DBP shall also undertake an Audit and Evaluation program that assists in assessing compliance to the EP and procedural controls.

7. CONSULTATION

The purpose of consultation is to:

- Obtain appropriate input into the ongoing improvement of this EP.
- Ensure key stakeholders remain up to date with DBNGP activities.
- Ensure timely response to landholder issues.
- Maintain dialogue with regulatory authorities, including local councils.

7.1 Consultations Undertaken

Key stakeholders including the Department of Planning, Land and Heritage (DPLH) and DEMIRS, along with relevant pipeline operations personnel previously participated in a HAZID to identify and assess the potential environmental hazards associated with the operations and maintenance activities for the DBNGP in November 2023. Furthermore, consultation with other stakeholders including the Department of Water and Environmental Regulation (DWER) is undertaken as the need arises to ensure that operations associated with the DBNGP are managed in accordance with relevant statutory requirements.

Recent consultation with key regulators is described below:

- Consultation with DWER (OEPA) in relation to close out of rehabilitation for pipeline activities assessed under part IV of the EP Act. DWER reporting is also completed annually and on a 5-year basis for some projects.
- Ongoing discussions with DEMIRS in regard to pipeline operator status, annual reporting, new projects, clearing permit and audits.
- DWER (DoW) licensing for water bores along the route including renewal information.
- DBCA and DPaW in relation to fauna permit and renewals or updates to the fauna permit as well as access to conservation estates as the land manager.
- DEMIRS in relation to the inclusion of Burrup Fertilisers Lateral, including transfer of lateral ownership, nomination of operator and minor works.

The Wellesley Meter Station consultation included LandCorp (as the landholder), Albemarle Lithium Plant, Shire of Harvey, EPA (referral of project, DAWE (EPBC referral), DEMIRS (pipeline license) and DWER (clearing permit). Outcomes included a no assessment / not a controlled action from EPA and DAWE, a clearing permit application (awaiting outcome from DWER), an access arrangement from the Shire of Harvey and discussions on the construction of a road and a sub-lease with LandCorp.

7.2 Approach and Ongoing Engagement

DBNGP Corridor Asset Management Plan (TEB-001-0024-09) details approach for stakeholder consultation and ongoing communication, including relevant landholders, regulatory authorities, Aboriginal and other interest groups and the general public are undertaken as part of the DBNGP operation activities. Monthly engagement with DEMIRS is also conducted to discuss any progress, concerns, or upcoming submission from DBNGP.

The schedule and key messages to be included in the consultation program is governed by the Land Management Plan. All contact with stakeholders will be recorded in the X-info Connect (GIS). The Land Management department and the HSE department are responsible for the development

and distribution of corporate awareness publications to communicate the details of our environmental commitments to key stakeholders. All other relevant details about land use, foreign crossings, landholder concerns and issues are to be recorded in the X-info Connect for future reference and reporting. DBP will review and formally report communications recorded in the X-info Connect (GIS) to key regulatory agencies in the Annual Compliance Report.

Formal contact with all landholders will be determined relevant to the perceived risk, with ongoing liaison throughout the year. DBP has a risk ranking system to classify the risk a landowner presents to the DBNGP, where 1 is low risk, 2 is medium risk and 3 is high risk. Risk ranking is conducted once a year, although rankings can be altered at any time if circumstances change. The frequency of landowner consultations is dependent on the risk ranking, although DBP target annual consultation with all landholders. These consultations provide an opportunity for the landowner to advise DBP of any change to their contact details, land use requirements and future expectations. Additionally, DBP can use the consultations to measure the risk posed and confirm the current ranking or propose another. DBP promote awareness of risks and emergency protocols.

All contacts involve the dissemination of information about the DBNGP, discussion of any concerns and education of pipeline safety to increase awareness. This ongoing process is designed to decrease the risk of third-party incidents and to encourage ownership of the activities around the pipeline. Ongoing liaison with these landholders is undertaken by Transmission Operations land management staff in accordance with the DBNGP Corridor Asset Management Plan (TEB-001-0024-09).

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