



Bulloo Interlink Pipeline

Petroleum Pipeline Licence 2087

Environmental Authority Supporting Information Report

APA Bulloo Interlink Pipeline Pty Ltd

July 2026



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Acronyms and Abbreviations

Acronym/ abbreviation	Definition
AHD	Australian Height Datum
ALARP	As low as reasonably practicable
APA	APA Bulloo Interlink Pipeline Pty Ltd (an APA Group company)
APGA	Australian Pipeline and Gas Association
AQMS	Air quality monitoring station
AS	Australian Standard
ASS	Acid sulfate soils
AWS	Automatic weather station
Biosecurity Act	<i>Biosecurity Act 2014</i> (Qld)
BoM	Bureau of Meteorology
CC-SEA	Channel Country Strategic Environmental Area
CEMP	Construction Environmental Management Plan
CHMA	Cultural Heritage Management Agreement
CHMP	Cultural Heritage Management Plan
CRoW	Construction Right of Way
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DETSI	Department of Environment, Tourism, Science and Innovation (Qld)
DEMP	Decommissioning Environmental Management Plan
DIWA	Directory of Important Wetlands in Australia
DPI	Department of Primary Industries (Qld)
DWATSIPM	Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism (Qld)
EA	Environmental authority
EIS	Environmental impact statement
EO Act	<i>Environmental Offsets Act 2014</i> (Qld)
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EP Regulation	Environmental Protection Regulation 2019 (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Act 1999</i> (Cth)
EPP	Environmental protection policy
ERA	Environmentally relevant activity
ESA	Environmentally Sensitive Area
EVs	Environmental values
GDE	Groundwater dependent ecosystem
GHD	GHD Pty Ltd
HDD	Horizontal directional drilling
IAQM	Institute of Air Quality Management
km	Kilometre
KP	Kilometre point
kPa	Kilopascals

Acronym/ abbreviation	Definition
ML	Megalitres
MNES	Matters of national environmental significance
MPa	Megapascal
MSES	Matters of state environmental significance
MWP	Moomba to Wilton Pipeline
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
NSW	New South Wales
NT Act	<i>Native Title Act 1993</i> (Cth)
OEMP	Operational Environmental Management Plan
OSOM	Oversize overmass
Planning Act	<i>Planning Act 2016</i> (Qld)
PPL 2087	Petroleum Pipeline Licence 2087, the purpose of the supporting information report
Qld	Queensland
RE	Regional ecosystem
RIDA	Regional Interests Development Approval
RO	Reverse osmosis
RNTBC	Registered Native Title Body Corporate
RPI Act	<i>Regional Planning Interests Act 2014</i> (Qld)
SCADA	Supervisory control and data acquisition
SEA	Strategic environmental area
SIR	Supporting Information Report (this report)
SMP	Species Management Program
SPRAT	Species Profile and Threats database
SWQP	South West Queensland Pipeline
TEC	Threatened ecological community
TJ	Terajoules
TMR	Department of Transport and Main Roads (Qld)
VM Act	<i>Vegetation Management Act 1999</i> (Qld)
Water Act	<i>Water Act 2000</i> (Qld)
WQO	Water quality objective

Glossary

Term	Definition
Construction right of way (CRoW)	The area that would be directly disturbed to construct the pipeline within the study area (includes the trench, temporary storage areas and construction manoeuvring areas). The nominal CRoW width is up to 40 m.
Pipeline alignment	Refers to the pipeline centreline.
Pipeline easement (the easement)	The permanent operational easement for the project that would be established to facilitate ongoing access and maintenance. Allows the pipeline operator a legal right to enter land to construct, operate and maintain the pipeline. It is registered on the underlying land title and remains on title. The nominal easement width for the project is 30 m.
Project	The project includes constructing, operating (including maintaining) and decommissioning approximately 236 km of underground natural gas transmission pipeline located in Queensland (Qld), and associated above ground infrastructure to connect to the South West Queensland Pipeline.
Project site	The land required to construct, operate (including maintain) and decommission the project, and defines the extent of land subject to project approval. The project site comprises the 40 m wide CRoW, within which the permanent easement and surface operational facilities would be located. It also includes additional land required outside the CRoW for temporary and ancillary facilities, including construction compounds, temporary workspaces, temporary accommodation facility, access track, and land required to support the project's water servicing strategy.
Study area	The full extent of land with the potential to be directly or indirectly affected by the project (e.g. by noise and vibration, visual or traffic impacts), assessed for environmental values (EVs), including the project site, survey area and surrounding context.
Survey area	The area physically surveyed on the ground, within and adjacent to the study area.

1. Introduction

1.1 Project overview

APA Bulloo Interlink Pipeline Pty Ltd (APA), which is part of the APA group of companies (the APA Group) is planning to develop the Bulloo Interlink Pipeline, an underground high-pressure gas pipeline that would link the South West Queensland Pipeline (SWQP) in Queensland (Qld) with the Moomba to Wilton Pipeline (MWP) in New South Wales (NSW). The pipeline would provide a more direct route for natural gas to be transported from Australia's northern production areas to southern gas markets.

The Bulloo Interlink Pipeline would have a total length of approximately 236 kilometre (km) located in Qld.

The section of the Bulloo Interlink Pipeline located in Qld (referred to as 'the project' for the purposes of this document) would require an environmental authority (EA) under the *Environmental Protection Act 1994* (Qld) (EP Act) for a resource activity. The project involves carrying out the activity prescribed in Schedule 3, item 5 of the Environmental Protection Regulation 2019 (Qld) (EP Regulation), being the construction of a new pipeline exceeding 150 km under a petroleum authority.

APA has lodged an application for an area petroleum pipeline licence (PPL) (PPL(a) 2087) under the *Petroleum and Gas (Production and Safety) Act 2004* (Qld) (P&G Act) for the project.

Approval for the NSW section of the Bulloo Interlink Pipeline would be sought under a separate approval process in accordance with NSW legislation and approval requirements.

1.1.1 Location

The project would be located within the Bulloo Shire local government area in the vicinity of the Noccundra township within the traditional Country of the Wangkumarra People and Kullilli People. The project would extend south from the tie-in point with the SWQP for about 186 km, then would traverse south-west for about 30 km, and south about 20 km to the Qld–NSW border. The location and key features of the project are shown in Figure 1.1.

1.1.2 Key project features

The project would be designed, constructed and operated in accordance with the *AS 2885 Pipelines – Gas and Liquid Petroleum* series of standards (AS 2885) and the Australian Pipelines and Gas Association (APGA) *Code of Environmental Practice – Onshore Pipelines* (APGA Code of Environmental Practice) (APGA, 2022).

The key operational features of the project would include:

- an underground high-pressure, steel gas transmission pipeline with a length of about 236 km and an outside diameter of 711 mm (28 inch)
- a permanent easement of up to 30 metres (m)
- supporting surface infrastructure, including:
 - beginning of line facility, including a connection to the SWQP
 - temperature control station, including main line valve
 - cathodic protection units
 - main line valve
 - pipeline marker signs
- permanent access tracks.

An approximately 40 m wide construction right of way (CRoW) would be established to facilitate construction and access.

Key ancillary facilities and infrastructure outside the CRoW would include:

- a temporary accommodation facility located at the intersection of Wompah Gate Road and Tickalara Road
- a construction compound facility to stockpile line pipe located on Wompah Gate Road near the southern end of the project site.

Smaller temporary workspaces would also be provided at regular intervals along the CRoW to support construction activities.

Further information on the project's features and indicative construction methodology is provided in Section 4.

1.1.3 Program

Construction is proposed to commence (pending approvals) in mid-2027, with operation expected to commence in mid-2028.

Construction is expected to be undertaken in phases:

1. Site establishment works, including establishment of the construction facilities, would take about two months.
2. The main construction works are expected to take about eight months. During this phase, the pipeline and surface infrastructure would be installed, and the CRoW and temporary workspaces would be reinstated.
3. Hydrotesting and commissioning would take about two months.

There will be breaks where no work will take place following the main construction works and prior to commissioning. This schedule may be optimised during detailed design and once a construction contractor is appointed.

1.2 Purpose and scope of this report

This Supporting Information Report (SIR) has been prepared by GHD Pty Ltd (GHD) to support a site-specific application for an EA for PPL 2087, in accordance with the EP Act.

This SIR assesses the potential environmental impacts of the project in accordance with the environmental assessment requirements of the *Application requirements for petroleum activities ESR/2016/2357* (DESI, 2024).

This SIR:

- describes the existing environmental values (EVs) with respect to the potential impacts of the project
- assesses the potential impacts of constructing, operating and decommissioning the project
- describes avoidance and recommends measures to mitigate and manage the impacts identified.

1.3 Applicant details

Applicant details are as follows:

Company name: APA Bulloo Interlink Pipeline Pty Ltd

ABN/ACN:684 765 142

Address: APA Group, Level 25, 580 George Street, Sydney, NSW, 2000

Registered suitable operator: 101122652.

1.4 Report structure and content

The structure and content of this SIR are outlined in Table 1.1.

Table 1.1 Structure and content

Section	Description
Section 1 – Introduction	Outlines the key elements of the project and the purpose of this report.
Section 2 – Statutory framework assessment	Assesses the project against section 125 of the EP Act and the environmental objectives and performance outcomes included in Schedule 8, part 3, divisions 1 and 2 of the EP Regulation.
Section 3 – Legislative and policy context	Summarises the key legislative requirements and guidelines relevant to the project.
Section 4 – Project description	Describes the project for the purposes of the EA, including the infrastructure proposed and estimated land requirements, indicative construction methodology, and how the project would be operated, maintained and decommissioned.
Section 5 – Methodology	Defines the assessment study area and outlines the approach taken to assessment of potential impacts, including a risk-based approach to evaluation of those impacts.
Section 6 – Stakeholder engagement	Summarises engagement that has been conducted with key stakeholders for the project.
Section 7 – Impact assessment	Identifies and assesses the potential impacts on the environment from the construction, operation and decommissioning activities of the project.
Section 8 – Mitigation and management practices	Summarises risk-based mitigation and management measures that would be applied to potential impacts.

1.5 Limitations

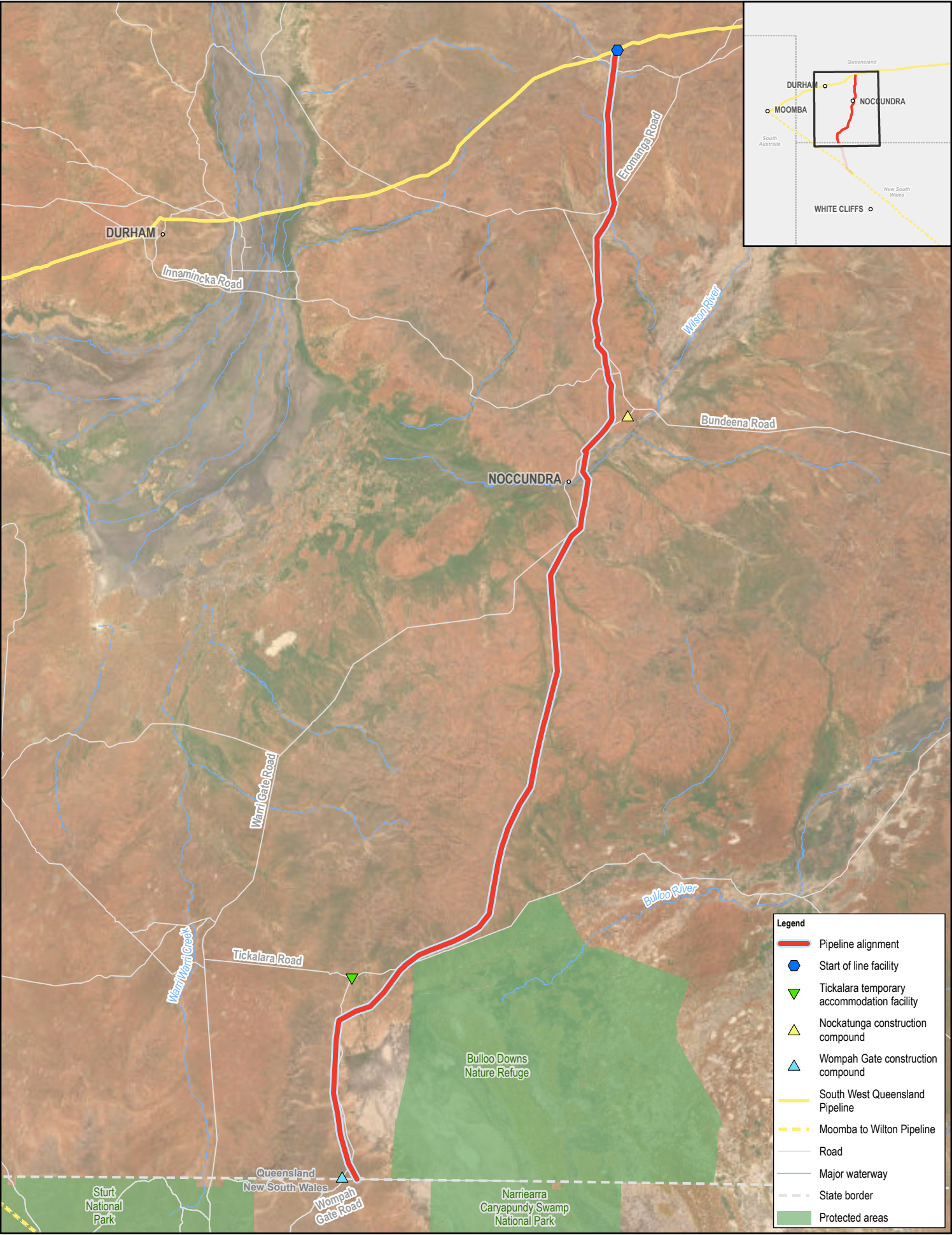
This report has been prepared by GHD for APA Bulloo Interlink Pipeline Pty Ltd and may only be used and relied on by APA Bulloo Interlink Pipeline Pty Ltd for the purpose agreed between GHD and APA Bulloo Interlink Pipeline Pty Ltd as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than APA Bulloo Interlink Pipeline Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations and assumptions set out in this report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.



Paper Size ISO A4
0 4.5 9 13.5 18
Kilometres
Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 54



APA



APA Group
Bulloo Interlink Pipeline

Project No. 12661648
Revision No. 0
Date 15/06/2026

Project location and key features

Figure 1.1

2. EP Act Requirements

2.1 Environmental values

Section 9 of the EP Act defines EVs as environmental qualities that support ecological health, community wellbeing, biodiversity and scientific or amenity values, including those identified under an environmental protection policy (EPP) or regulation. In accordance with the *Application requirements for petroleum activities* (DESI, 2024) and other relevant guidelines, the identification of EVs for the project has been informed by the EP Act and the applicable EPPs. Environmental values potentially impacted by the project include air, noise, water, waste and land.

Matters of state environmental significance (MSES) are Qld-significant EVs defined in Schedule 2 of the Environmental Offsets Regulation 2014 and summarised in Table 2.1 and discussed further in section 7.3.2 (terrestrial) and section 7.8.2 (aquatic) as relevant to the project.

Table 2.1 MSES summary

MSES value	Comments
Regulated vegetation – prescribed regional ecosystems (REs) that are endangered	No REs that are endangered are within the project site.
Regulated vegetation –prescribed REs that are of concern	No REs that are of concern are within the project site.
Regulated vegetation – prescribed REs that intersects with an area shown as a wetland on the vegetation management wetlands map	The project site does not intersect with an area shown as a wetland.
Regulated vegetation – essential habitat	Essential habitat is not mapped for the project site.
Regulated vegetation - prescribed RE located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature	Regulated vegetation within the defined distance of a watercourse is present along all mapped watercourses and drainage features within the study area.
Connectivity areas	The DETSI connectivity tool has been run and found the project would not have a significant reduction in landscape connectivity.
Wetlands and watercourses	No wetland protection areas or wetlands of high ecological significance are located within the project site. High ecological value waters are not defined for the project site.
Designated precinct in a strategic environmental area (SEA)	There is one designated precinct in a SEA (i.e. Channel Country) within the project site. This is situated along the Wilson River and extends upstream and downstream of the project site. A separate Regional Interests Development Approval (RIDA) is being sought under the <i>Regional Planning Interest Act 2014</i> (Qld).
Protected wildlife habitat – an area that is shown as a high risk area on the flora survey trigger map and that contains plants that are critically endangered wildlife, endangered wildlife or vulnerable wildlife	The project site intersects a high-risk area mapped on the protected plants flora survey trigger map, between Warri Gate Road and the pipeline alignment at kilometre point (KP) 83 on an existing vehicle access track. This area corresponds to a 2km buffer zone around a 1987 record of <i>Rhodanthe rufescens</i> occurring at the Noccundra Airstrip. Field surveys have not detected this species within the project site. The species is listed under the <i>Nature Conservation Act 1992</i> (NC Act) as near threatened and does not constitute MSES.
Protected wildlife habitat – koala habitat	No koala habitat is mapped for the project site.

MSES value	Comments
Protected wildlife habitat - A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a special least concern animal	Suitable habitat for species listed as critically endangered, endangered, vulnerable and special least concern under the NC Act is present within the project site.
Protected areas	None present within the project site.
Highly protected zones of State marine parks	None present within the project site.
Ish habitat areas	None present within the project site.
Regulated vegetation (defined watercourse)	Regulated vegetation within the defined distance of a watercourse is present along all mapped watercourses and drainage features within the study area.
Waterway providing for fish passage	The CRoW intersects with a number of waterways that provide for fish passage. Direct impacts to the Wilson River (major risk waterway for waterway barrier works) have been avoided through the use of horizontal directional drilling (HDD). This approach would avoid direct impacts to fish species, habitat and passage within the Wilson River. Construction approaches for trenched crossing are temporary, and it is not considered that the project would result in a residual impact.
Marine plants	None present within the study area.
Legally secured offset area	None present within the study area.

2.2 Application requirements

Compliance with application requirements under s125 of the EP Act is as demonstrated in Table 2.2. The project does not comprise a CSG activity¹ and would not involve exercising of underground water rights. Consequently, s126 and s126A of the EP Act do not apply to this report or application.

Consideration has therefore been given to the environmental objectives and performance outcome requirements as described in Schedule 8 of the EP Regulation, specifically:

- An operational assessment (Table 2.3) demonstrating how environmental objectives are achieved with regard to impacts on air, water, wetlands, groundwater, noise, waste and land (EP Regulation, Schedule 8, part 3, division 1)
- A land use assessment (Table 2.4) to demonstrate avoidance and minimisation of environmental harm (EP Regulation, Schedule 8, part 3, division 2).

Table 2.2 EP Act – s125 application requirements

Application requirement	Where addressed in application
(1) An application for an environmental authority must— (a) be made to the administering authority; and	The application was made to the Department of Environment, Tourism, Science and Innovation (DETSI).
(b) be made in the approved form; and	The approved form was submitted.
(c) describe all environmentally relevant activities for the application; and	The project involves the activity prescribed in Schedule 3, item 5 of the EP Reg, being the construction of a new pipeline exceeding 150 km under a petroleum authority.
(d) describe the land on which each activity will be carried out; and	Section 4.4 describes the projects land requirements. Existing EVs are discussed in Section 7.
(e) be accompanied by the fee prescribed under a regulation; and	The prescribed fee was paid.
(f) if 2 or more persons (joint applicants) jointly make the application—nominate 1 joint applicant as the principal applicant; and	N/A APA Bulloo Interlink Pipeline Pty Limited is the applicant

¹ CSG activity means a petroleum activity involving exploring for or producing coal seam gas (EP Act Schedule 4)

Application requirement	Where addressed in application
(g) state whether the application is— (i) a standard application; or (ii) a variation application; or (iii) a site-specific application; and	The application is a site-specific application.
(h) state whether the applicant is a registered suitable operator; and	APA is a registered suitable operator (Reference # 101122652).
(i) if a development permit under the Planning Act, or an SDA approval under the State Development Act, is required under either of those Acts for carrying out the environmentally relevant activities for the application—describe the permit or approval; and	N/A – The project does not require development permits or SDA approval.
(j) if the application is a standard or variation application—include a declaration that each relevant activity complies with the eligibility criteria; and	N/A – This application is a site-specific application.
(k) if the application is a variation application— (i) for a variation application under section 123(1)—state the standard conditions for the activity or authority the applicant seeks to change; or (ii) for a variation application under section 123(2)—state the standard conditions that are not the same as the Coordinator-General's conditions; and	N/A – This application is a site-specific application.
(l) if the application is a variation or site-specific application— (i) include an assessment of the likely impact of each relevant activity on the environmental values, including— (A) a description of the environmental values likely to be affected by each relevant activity; and (B) details of any emissions or releases likely to be generated by each relevant activity; and (C) a description of the risk and likely magnitude of impacts on the environmental values; and (D) details of the management practices proposed to be implemented to prevent or minimise adverse impacts; and (E) if paragraph (n) does not apply—details of how the land the subject of the application will be rehabilitated after each relevant activity ceases; and (ii) include a description of the proposed measures for minimising and managing waste generated by each relevant activity; and (iii) include details of any site management plan that relates to the land the subject of the application; and	Section 7 describes the existing EVs, presents and assessment of impacts on the EVs potentially affected by the project and includes proposed measures for minimising impacts.
(m) if the application is for a prescribed ERA—state whether the applicant wants any environmental authority granted for the application to take effect on a day nominated by the applicant; and	N/A – The application is not for a prescribed ERA.
(n) if the application is a site-specific application for a mining activity relating to a mining lease—be accompanied by a proposed PRC plan; and	N/A – No mining activities are to occur as a part of the project.
(o) include any other document relating to the application prescribed under a regulation.	All documents are provided, including as appendices to this report.
(2) Despite subsection (1)(l), if the application is a variation application under section 123(1), it need only include the matters mentioned in that subsection to the extent it seeks to change the standard conditions for the activity or authority.	N/A – This application is a site-specific application.

Application requirement	Where addressed in application
(3) Subsection (1)(l) does not apply for an application if— (a) either— (i) the EIS process for an EIS for each relevant activity the subject of the application has been completed; or (ii) the Coordinator-General has evaluated an EIS for each relevant activity the subject of the application and there are Coordinator-General's conditions that relate to each relevant activity; and (b) an assessment of the environmental risks of each relevant activity would be the same as the assessment in the EIS mentioned in paragraph (a)(i), or the evaluation mentioned in paragraph (a)(ii), if completed.	N/A – An environmental impact statement (EIS) is not required to be prepared for the project.
(4) Also, subsection (1)(l) does not apply for a variation application under section 123(2) if the application seeks only to apply the Coordinator-General's conditions.	N/A – This is a site-specific application.
(5) Despite subsection (1), if the application is a variation or site-specific application for the prescribed ERA mentioned in the Environmental Protection Regulation 2019, schedule 2, section 13A— (a) it need only include the matters mentioned in subsection (1)(l)(i)(A) to (D), (ii) and (iii) to the extent the matters relate to fine sediment, or dissolved inorganic nitrogen, entering the water of the Great Barrier Reef or Great Barrier Reef catchment waters; and (b) subsection (1)(l)(i)(E) does not apply for the application.	N/A – This application is not for a prescribed ERA.
(6) Subsection (1)(l) does not apply for a variation application or site-specific application, and subsection (1)(n) does not apply for a site-specific application for a mining activity relating to a mining lease, if— (a) the chief executive has, under chapter 3, part 2 or 3, approved the voluntary preparation of an EIS for the project the subject of the application and the applicant has— (i) started the EIS process for the application; or (ii) stated in the application that the applicant will prepare an EIS under chapter 3, part 1; or (b) the chief executive has, under chapter 3, part 3, decided that an EIS is required for the application; or (c) the Coordinator-General has, under the State Development Act, section 26(1)(a), declared that the project the subject of the application is a coordinated project for which an EIS under that Act is required.	N/A – An EIS is not required to be prepared for the project.
(7) Subsection (8) applies if— (a) an application for a prescribed ERA is accompanied by evidence showing the main purpose of applying for the environmental authority is to conduct research into, or test, technology or processes relating to an environmentally relevant activity for which information mentioned in subsection (1)(l)(i) and (ii) is not available; and (b) the application states that the term of the environmental authority applied for is 3 years or less.	N/A – This application is not for a prescribed ERA.
(8) Despite subsection (1), the application need not include the matters mentioned in subsection (1)(l)(i) and (ii) to the extent the information is not available.	All information is available and provided within this EA application.

Table 2.3 EP Regulation – operational assessment

Performance outcomes	Project performance
Air	
Environmental objective: The activity will be operated in a way that protects the environmental values of air.	
1 There is no discharge to air of contaminants that may cause an adverse effect on the environment from the operation of the facility.	As discussed in section 7.2, emissions associated with the project are expected to be minimal, infrequent and localised to the source. No continuous emission sources are anticipated during normal operation of the project. Given the nature, scale and infrequent occurrence of maintenance activities, the potential risk of airborne contaminants having adverse effects on the environment during operation is considered very low.
2 All of the following— (a) fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised;	N/A – Fugitive emissions from contaminants are not likely. Storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with AS 1940:2017 The storage and handling of flammable and combustible liquids.
(b) contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air;	Management measures (as per section 8 would be implemented for the project, to mitigate the potential for adverse effects on the environment.
(c) releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.	N/A – Although releases of small quantities of gas would result from internal pipeline cleaning and inspection during routine maintenance, this is only anticipated involve the release of approximately 2 m ³ of gas into the atmosphere. Such events would be infrequent and only occur once a year on average, and would generate minimal emissions. The volume of gas released is negligible when considered in the context of overall regional or national greenhouse gas inventories (section 7.2).
Water	
Environmental objective: The activity will be operated in a way that protects environmental values of waters.	
1 There is no actual or potential discharge to waters of contaminants that may cause an adverse effect on an environmental value from the operation of the activity.	The pipeline is buried for most of its length and the likelihood of impacts to surface water and hydrology is low (section 7.8). Any impacts that do occur are expected to be temporary and highly localised. If repairs to the buried pipeline are required, short-term excavation may be necessary, which may include excavation below the water table. However, such events are infrequent and typically confined to small areas.
2 All of the following— (a) the storage and handling of contaminants will include effective means of secondary containment to prevent or minimise releases to the environment from spillage or leaks;	The storage and handling of potential contaminants would be limited to maintenance activities. The storage and handling of fuels and chemicals shall comply with all relevant legislation and Australian Standard (AS) 1940 – The storage and handling of flammable and combustible liquids.
(b) contingency measures will prevent or minimise adverse effects on the environment due to unplanned releases or discharges of contaminants to water;	Management measures as per section 8 would be implemented for the project, to mitigate the potential for adverse effects on the environment.
(c) the activity will be managed so that stormwater contaminated by the activity that may cause an adverse effect on an environmental value will not leave the site without prior treatment;	Stormwater contamination generated by the project would be managed through the implementation of erosion and sediment control measures in accordance with the ESCP prepared with reference to Code of Environmental Practice (APGA, 2022) and the Best Practice Erosion and Sediment Control Guidelines (IECA, 2025) (section 8).
(d) the disturbance of any acid sulfate soil, or potential acid sulfate soil, will be managed to prevent or minimise adverse effects on environmental values;	N/A – It is considered based on available data that acid sulfate soils (ASS) are not present within the project site, as it is located well above 20 m Australian Height Datum (AHD) and is not located near the coastline (section 7.3).

Performance outcomes	Project performance
(e) acid producing rock will be managed to ensure that the production and release of acidic waste is prevented or minimised, including impacts during operation and after the environmental authority has been surrendered;	N/A – Acid producing rock is not anticipated to be encountered (section 7.3).
(f) any discharge to water or a watercourse or wetland will be managed so that there will be no adverse effects due to the altering of existing flow regimes for water or a watercourse or wetland;	Management measures as per section 8 would be implemented during the operation of the project, to mitigate the potential for adverse effects on the environment.
(g) for a petroleum activity, the activity will be managed in a way that is consistent with the coal seam gas water management policy, including the prioritisation hierarchy for managing and using coal seam gas water and the prioritisation hierarchy for managing saline waste;	N/A – The project would not involve the use of coal seam gas water or generation of saline waste.
(h) the activity will be managed so that adverse effects on environmental values are prevented or minimised.	Management measures as per section 8 would be implemented during the project, to mitigate the potential for adverse effects on the environment.
Wetlands	
Environmental objective: The activity will be operated in a way that protects the environmental values of wetlands.	
1 There will be no potential or actual adverse effect on a wetland as part of carrying out the activity.	Following construction, the pipeline would be fully contained below the ground, with surrounding soils and waterways restored to pre-construction contours and vegetation cover. Potential impacts to wetlands during the operation of the project are expected to be negligible (section 7.7.5). The pipeline alignment has been selected to run adjacent to existing roads (as far as practicable), and therefore limited new access tracks and waterway crossings would be required for ongoing maintenance. The pipeline alignment would therefore minimise potential risks from access tracks such as erosion, sedimentation and spills.
2 The activity will be managed in a way that prevents or minimises adverse effects on wetlands.	Management measures as per section 8 would be implemented during the project, to mitigate the potential for adverse effects on the environment.
Groundwater	
Environmental objective: The activity will be operated in a way that protects the environmental values of groundwater and any associated surface ecological systems.	
1 Both of the following apply— (a) there will be no direct or indirect release of contaminants to groundwater from the operation of the activity;	The pipeline would be designed and operated in accordance with AS 2885 to minimise the chance of failure. There is a very low risk of localised and temporary impacts on shallow groundwater quality and associated riparian vegetation, from pipeline integrity failure and associated gas migration into shallow groundwater should a failure occur (7.8).
(b) there will be no actual or potential adverse effect on groundwater from the operation of the activity.	The project is considered unlikely to impact groundwater based on available data to impact on groundwater resources, groundwater users or terrestrial GDEs (section 7.8). Excavation for pipeline repairs or maintenance may intersect shallow groundwater. If dewatering is required where depth to groundwater is shallow, there is the potential for localised, short-term, temporary lowering of the local groundwater table and alteration of shallow groundwater flow pathways.
2 The activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.	Management measures as per section 8 would be implemented during the operation of the project, to mitigate the potential for adverse effects on the environment.

Performance outcomes	Project performance
Noise	
Environmental objective: The activity will be operated in a way that protects the environmental values of the acoustic environment.	
1 Sound from the activity is not audible at a sensitive receptor.	While construction and decommissioning activities have the potential to generate noise at sensitive receptors, the limited number of receptors and their typically significant separation distances from the project site effectively reduce the risk of material impacts to negligible levels. The temporary and transient nature of these activities would also act to mitigate the risk of significant and extended noise impacts at the closest residential receptor. It is expected that the project would comply with the criteria contained in the Environmental Protection (Noise) Policy 2019 (EPP Noise) (section 7.4).
2 The release of sound to the environment from the activity is managed so that adverse effects on environmental values, including health and wellbeing and sensitive ecosystems, are prevented or minimised.	Management measures as per section 8 would be implemented to mitigate the potential for adverse effects on the environment.
Waste	
Environmental objective: Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.	
1 Both of the following apply— (a) waste generated, transported or received is managed in accordance with the waste and resource management hierarchy under the <i>Waste Reduction and Recycling Act 2011</i> ;	Activities that generate, transport and dispose of waste would be managed in accordance with the waste and resource management hierarchy defined in the <i>Waste Reduction and Recycling Act 2011</i> (Qld) (section 7.6.5)
(b) if waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values.	Management measures as per section 8 would be implemented to mitigate the potential for adverse effects on the environment.
Land	
Environmental objective: The activity is operated in a way that protects the environmental values of land, including soils, subsoils, landforms and associated flora and fauna.	
1 There is no actual or potential disturbance or adverse effect to the environmental values of land as part of carrying out the activity.	Disturbance has been limited the areas required for the safe construction, operation and decommissioning of the pipeline and impacts to the EVs of land are expected to be minimal for the project as discussed in section 7.3.
2 All of the following apply— (a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the environmental values of land;	Management measures as per section 8 would be implemented for the project, including progressive closure and reinstatement, to mitigate the potential for adverse effects on the environment.
(b) areas disturbed will be rehabilitated or restored to achieve sites— (i) that are safe and stable; and (ii) where no environmental harm is being caused by anything on or in the land; and (iii) that are able to sustain an appropriate land use after rehabilitation or restoration;	The CRoW and ancillary facilities would be cleared of all construction equipment, materials and waste, and stabilised and rehabilitated as soon as practicable after pipe laying and backfill, to: – return the easement land to as close as possible to its pre-existing state within a reasonable timeframe – re-establish topsoil cover and stability as soon as possible – re-establish pre-existing topographic contours and drainage patterns – establish erosion control measures (e.g. contours banks, filter strips) in erosion prone areas – provide suitable conditions to allow vegetation (where it was present) to re-establish. The rehabilitation methodology would be developed in consultation with landholders. The aim of rehabilitation

Performance outcomes	Project performance
	would be returning disturbed areas not required for operation to their former use and making them suitable for existing uses (where present).
(c) the activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants;	Management measures as per section 8 would be implemented to mitigate the potential for adverse effects on the environment.
(d) the application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.	The application of effluent or waste to land would be managed sustainably and in accordance with relevant guidelines and conditions of approval. Water used during construction and operation would be limited to potable or appropriately sourced water applied via water carts (e.g. for dust suppression) and would be managed to prevent adverse effects on soil properties.

Table 2.4 EP Regulation – land use assessment

Performance objective	Project performance
Site suitability	
Environmental objective: The choice of the site, at which the activity is to be carried out, minimises serious environmental harm on areas of high conservation value and special significance and sensitive land uses at adjacent places.	
1 Both of the following apply— (a) areas of high conservation value and special significance likely to be affected by the proposal are identified and evaluated and any adverse effects on the areas are minimised, including any edge effects on the areas;	The following considerations have been incorporated into the selection of the pipeline alignment (section 8.1): – The pipeline alignment has been refined to avoid hollow-bearing riparian trees and high-value sensitive sites where possible. – the CRoW is to be minimised to the greatest practicable extent. The width of the CRoW would be reduced to between 20m to 30m through sensitive drainage features where practicable. This has reduced the impact footprint, the amount of bank stabilising vegetation to be removed and the number of significant hollow-bearing trees to be removed. – Existing access tracks have been utilised where possible, with access track passing/widening locations located outside of vegetated areas, so that no vegetation removal is required to facilitate access track construction or upgrades. – HDD has been adopted at the Wilson River SEA, with natural bed/bank profiles to be reinstated to pre-works forms.
(b) the activity does not have an adverse effect beyond the site.	The project footprint is clearly defined (section 4), and mitigation measures (section 8) would be implemented to prevent or minimise potential direct and indirect impacts on surrounding EVs.
2 Both of the following apply— (a) areas of high conservation value and special significance likely to be affected by the proposal are identified and evaluated and any adverse effects on the areas are minimised, including any edge effects on the areas;	The following considerations have been incorporated into the selection of the pipeline alignment (section 8.1): – The pipeline alignment has been refined to avoid hollow-bearing riparian trees and high-value sensitive sites where possible. – The CRoW is to be minimised to the greatest practicable extent. The width of the CRoW is to be reduced to between 20m to 30m through sensitive drainage features where practicable. This has reduced the impact footprint, the amount of bank stabilising vegetation to be removed and the number of significant hollow-bearing trees to be removed.
(b) critical design requirements will prevent emissions having an irreversible or widespread impact on adjacent areas.	Emissions generated by the project (section 7) is not expected to result in irreversible or widespread impacts on adjacent areas. Emissions would be managed through the

Performance objective	Project performance
	implementation of mitigation measures (section 8), with consideration of equipment types and operation, materials and vehicle usage, to prevent or minimise off-site effects.
Location on site	
Environmental objective: The location for the activity on a site protects all environmental values relevant to adjacent sensitive uses.	
1 The location for the activity means there will be no adverse effect on any environmental values.	The location of the project was selected to avoid adverse impacts on EVs (section 4.4 and section 8.1). Impacts are assessed (section 7) and mitigation measures proposed to avoid and minimise (section 8) adverse effects on EVs.
2 Both of the following apply— (a) the activity, and components of the activity, are carried out on the site in a way that prevents or minimises adverse effects on the use of surrounding land and allows for effective management of the environmental impacts of the activity;	Management measures as per section 8 would be implemented to mitigate the potential for adverse effects on the environment.
(b) areas used for storing environmentally hazardous materials in bulk are located taking into consideration the likelihood of flooding.	The storage hazardous materials shall comply with all relevant legislation and Australian Standard AS 1940 – The storage and handling of flammable and combustible liquids.
Critical design requirements	
Environmental objective: The design of the facility permits the site at which the activity is to be carried out to operate in accordance with best practice environmental management.	
1 The activity does not involve the storage, production, treatment or release of hazardous contaminants, or involve a regulated structure.	As discussed in section 7.7, some hazardous waste is expected to be generated during the project; however, it would not be treated on-site and would only be stored temporarily prior to disposal/collection.
2 All of the following apply— (a) all storage provided for hazardous contaminants includes secondary containment to prevent or minimise releases to the environment from spillage or leaks;	The storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with AS 1940:2017 <i>The storage and handling of flammable and combustible liquids</i> .
(b) regulated structures comply with the document called 'Manual for assessing consequence categories and hydraulic performance of structures', published by the department;	It is not proposed that regulated structures would be required for the project. If any water storages (e.g. sediment basins, hydrotest tanks/ponds) required for the project could be considered regulated structures, the proponent would apply the <i>Manual for assessing consequence categories and hydraulic performance of structures</i> (DETSI, 2025h) to hazard assessment, freeboard/design storage allowance, liner selection, leak detection and decommissioning criteria supported by a design plan by a suitably qualified person.
(c) containers are provided for the storage of hazardous contaminants that are secured to prevent the removal of the containers from the site by a flood event;	The storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with AS 1940:2017, with containers secured and managed to prevent loss of containment or removal from site, including during flood events.
(d) the design of the facility prevents or minimises the production of hazardous contaminants and waste;	The project comprises an underground high-pressure gas pipeline and limited surface infrastructure, including facilities and controls for handling waste during the construction of the project, minimising the production of hazardous contaminants and waste.
(e) if the production of hazardous contaminants and waste is not prevented or minimised under paragraph (d)—the design of the facility contains and treats hazardous contaminants rather than releasing them.	Some hazardous waste is expected to be generated during construction of the project (section 7.7). Appropriate waste handling methods for each waste type are proposed.

3. Legislative context

The key legislative requirements and guidelines relevant to the assessment for the project are described in the following sections.

3.1 Queensland

Table 3.1 summarises the key Qld legislation relevant to the construction and operation of the project, and identifies how each statute applies to the project and is addressed through the EA application and supporting assessments. Further details are provided in the following sections.

Table 3.1 State legislation relevant to the project

Legislation	Purpose	Relevance to the project	How legislation has been addressed
<i>Aboriginal Cultural Heritage Act 2003</i> (ACH Act)	Protection and conservation of Aboriginal cultural heritage	Relevant to all construction and ground-disturbing activities proposed across the project site.	The duty of care would be met through the implementation of the <i>Aboriginal Cultural Heritage Act 2003 Duty of Care Guidelines</i> (Cultural Heritage Duty of Care Guidelines) (DATSIP, 2004). A Cultural Heritage Management Agreement (CHMA) (or similar) is currently being prepared for the project.
<i>Biosecurity Act 2014</i> (Biosecurity Act)	Prevention of the spread of pests, diseases and contaminants	Relevant due to the scale of ground disturbing works and vehicle movements during construction of the project, and the associated risk of introducing or spreading weeds and/or pathogens.	The general biosecurity obligation would be managed through construction biosecurity measures implemented via the Construction Environmental Management Plan (CEMP) for the project.
<i>Environmental Offsets Act 2014</i> (EO Act) Environmental Offsets Regulation 204 (EO (regulation))	Offset significant residual impacts of prescribed activities	Potentially relevant if significant residual impacts on MSES occur as a result of the project.	MSES significant residual impact assessments have been undertaken. An offset for impacts to MSES regulated vegetation (watercourse) is likely required. .
<i>Environmental Protection Act 1994</i> (EP Act)	Protection of environmental values; provides EA framework	Relevant as the primary legislation governing the EA application for the project.	An EA is being sought under the EP Act, and an environmental objective assessment undertaken. EIS is not required based on the scale of the project.
Environmental Protection Regulation 2019 (EP Regulation)	Prescribes environmentally relevant activities (ERAs) and EA assessment requirements and defines environmentally sensitive areas (ESAs)	Relevant due to the proposed construction of a petroleum pipeline >150 km (ERA 5). Category C ESAs are mapped for the project site.	The project involves the activity prescribed in Schedule 3, item 5 of the EP Reg, therefore, a site-specific EA is required.
Environmental Protection (Air) Policy 2019 (EPP Air)	Protection of air quality values	Relevant where the project activities have the potential to cause dust or release emissions	Relevant EVs and objectives considered in Appendix D Air Quality Impact Assessment.
Environmental Protection (Noise) Policy 2019 (EPP Noise)	Protection of acoustic values	Relevant where the project activities have the potential to cause a noise nuisance.	Relevant EVs and objectives considered in Appendix E Noise and Vibration Impact Assessment.

Legislation	Purpose	Relevance to the project	How legislation has been addressed
Environmental Protection (Water and Wetland Biodiversity) Policy 2019	Protection of water and wetland values	Relevant where construction activities interact with watercourses, wetlands or groundwater.	Relevant EVs and objectives considered in Appendix A Water Assessment and Appendix C Aquatic Ecology Assessment .
<i>Nature Conservation Act 1992</i> (NC Act)	Protection of native wildlife and habitat	Relevant due to the potential disturbance of fauna habitat during construction of the project.	Targeted field surveys have informed avoidance of fauna habitat values across the project site. A high-risk Species Management Program (SMP) is required for impacts to animal breeding places eg colonial breeders (microbats), conservation significant species dependent on hollowing-bearing trees etc. (section 7.3).
<i>Petroleum and Gas (Production and Safety) Act 2004</i>	Regulation of petroleum pipelines and safety	Relevant as the project would involve pipeline construction, operation and safety.	APA has lodged a PPL application for the project.
<i>Planning Act 2016</i> (Planning Act) Planning Regulation 2017 (Planning Regulation)	Framework for land use planning and development assessment	Relevant due to the development associated with construction activities, temporary infrastructure and ancillary facilities that may constitute assessable development.	The project is not assessable development for the purposes of the Bulloo Planning Scheme. Vegetation clearing associated with the project is exempt clearing work (under Schedule 21 of the Planning Regulation) on the basis that the project is a petroleum activity. Assessable development triggers may apply where operational works (eg waterway barrier works) cannot be achieved using accepted development codes. Appropriate development approvals would be sought.
<i>Queensland Heritage Act 1992</i>	Protection of state and local heritage places	Relevant for confirming the presence of heritage-listed places within the project site.	Desktop searches have confirmed that no state or local heritage-listed places are within or adjacent to the project site.
<i>Regional Planning Interests Act 2014</i> (RPI Act)	Protection of areas of regional interest, including SEAs	Relevant as a part of the project involves a resource activity intersecting a designated precinct in the Channel Country SEA.	A RIDA is required and progressing alongside the EA application. A designated precinct in Channel Country SEA is a MSES, however impacts are not significant and offsets are not proposed.
<i>Vegetation Management Act 1999</i> (VM Act)	Regulation of vegetation clearing	Relevant where clearing regulated vegetation.	Regulated vegetation is discussed in section 7.3.2.
<i>Water Act 2000</i> (Water Act)	Sustainable management of water resources	Relevant for any watercourse crossings and water-related works.	Any relevant permits and approvals required for the project would be sought as required.

3.2 Commonwealth

3.2.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a framework to protect and manage MNES, which for the project include:

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

There is no Commonwealth land located within or adjacent to the project site.

A referral under the EPBC Act for the project was lodged on 28 May 2026 (EPBC 2026/10534). The proposed action is a controlled action, and the project will be assessed by preliminary documentation.

3.2.2 Native Title Act 1993

The *Native Title Act 1993* (Cth) (NT Act) recognises and protects the rights and interests of Aboriginal peoples and Torres Strait Islanders possessed under their traditional laws and customs in relation to land and waters. The application of the NT Act in Qld is supported by the *Native Title (Queensland) Act 1993* (Qld). Table 3.2 describes native title determinations in effect relevant to the project.

Table 3.2 *Native title determinations in effect across land parcels within the project site*

Real property description	Native title holders
Lot 3 on WLA14	Wangkumarra People and Boonthamurra People
Lot 424 on SP307646	Wangkumarra People and Boonthamurra People
Lot 2 on SP184928	Wangkumarra People
Lot 3 on BI22	Wangkumarra People, Boonthamurra People and Kullilli People
Lot 1322 on PH1737	Kullilli People
Lot 1673 on SP289790	Kullilli People
Lot 468 on PH1653	Wangkumarra People and Kullilli People

4. Project Description

This section provides a description of the project, including:

- proposed infrastructure;
- estimated land requirements;
- indicative construction methodology, including timing, likely resources, access and facilities; and
- how the project would be operated, maintained and decommissioned.

4.1 Project scope

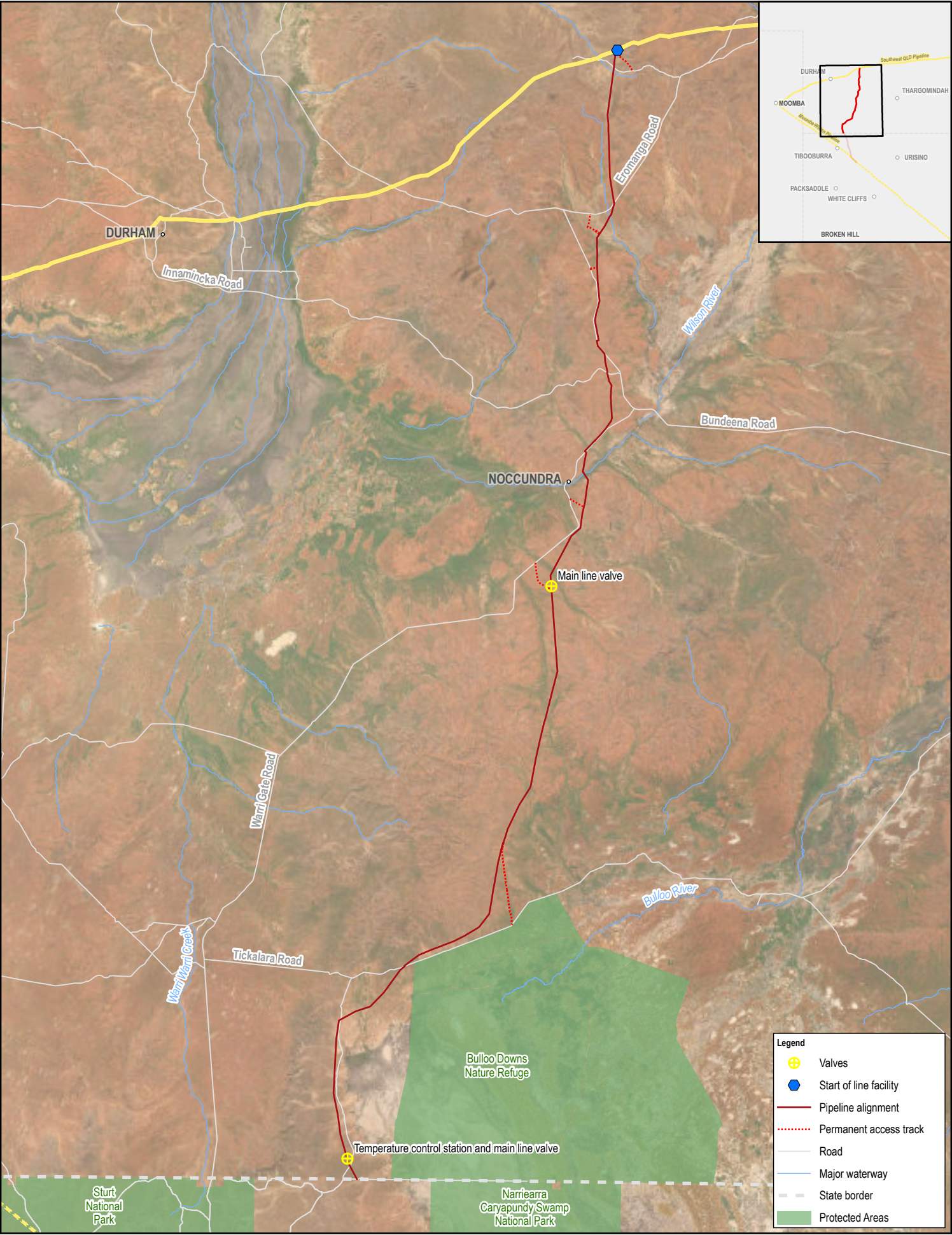
The project involves constructing, operating (including maintaining) and decommissioning the Qld section of the Bulloo Interlink Pipeline, PPL 2087, which consists of an underground gas transmission pipeline (about 236 km long) and associated surface infrastructure.

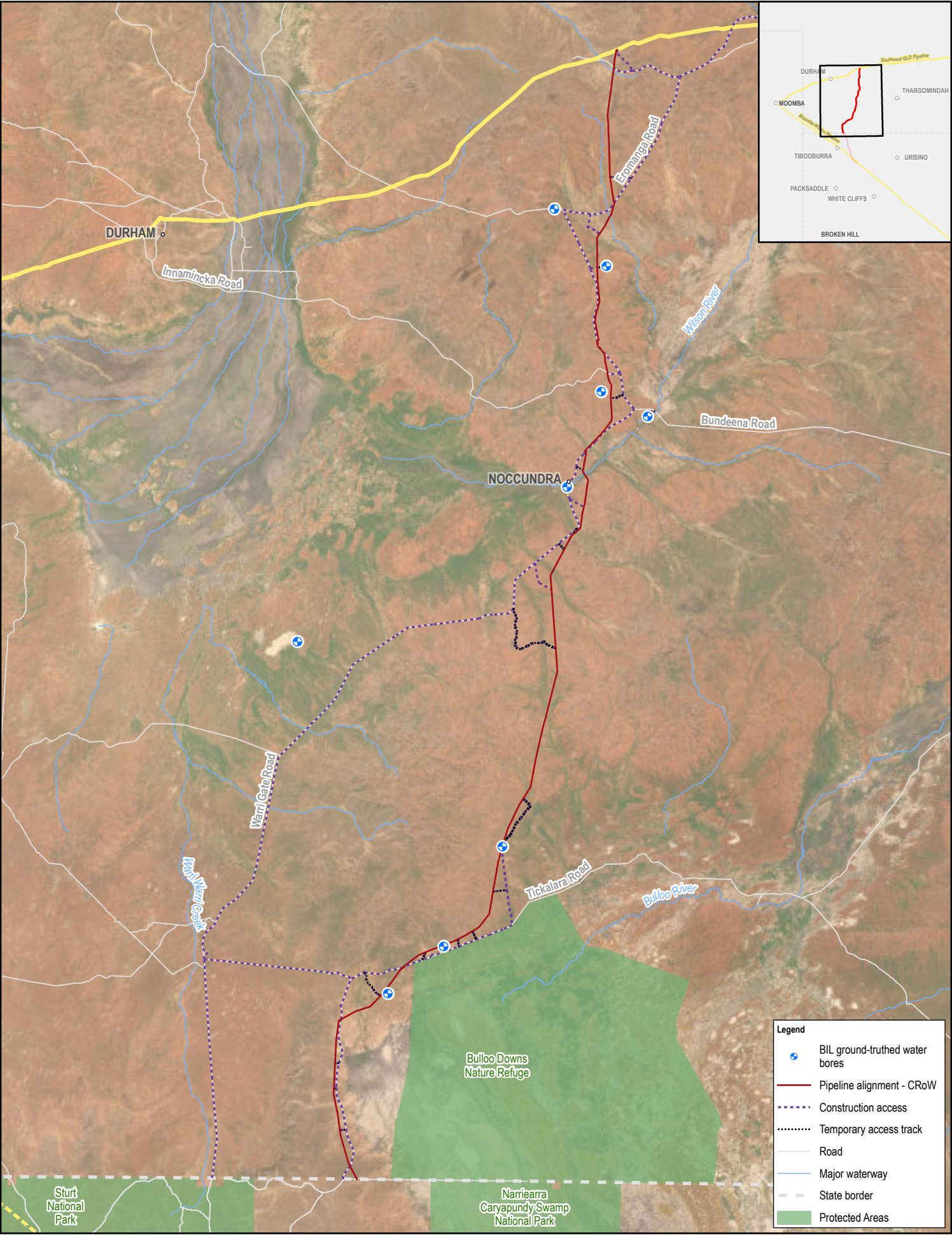
A summary of the project's main features is provided in Table 4.1, and shown on Figure 4.1 (key operational features) and Figure 4.2 (key construction features).

Table 4.1 Project description summary

Project feature	Description	Section reference
Project site	The term 'project site' refers to the area required to construct, operate (including maintenance) and decommission the project. The project site has an area of approximately 1,130.1 ha.	N/A
Project infrastructure and operation		
Pipeline	Underground high-pressure steel natural gas transmission pipeline extending from the tie-in point with the SWQP to the NSW section of the Bulloo Interlink Pipeline at the Qld-NSW border, with a total length of about 236 km.	Section 4.2.1
Surface infrastructure	Surface infrastructure required to operate the project in Qld includes: – beginning of line connection facility at the tie-in point with the SWQP – temperature control station, including a main line valve – cathodic protection units – main line valve – pipeline marker signs – permanent access tracks.	Section 4.2.2
Operational footprint	The term 'operational footprint' refers to the area of land required to operate the project, including the permanent easement for the pipeline and land required for surface infrastructure. The operational footprint has an area of about 749.9 ha, which consists of the 30 m wide permanent easement and additional areas for surface infrastructure outside the easement.	Section 4.4.1
Estimated development cost	\$800 million	N/A
Pipeline Design life	50 years	N/A
Operational workforce	Remote, with maintenance site visits as required.	Section 4.8.2
Construction		
Construction footprint	The term 'construction footprint' refers to the area of land required to construct the project, including the CRoW and construction facilities. Approximately 83.24% of the project site consists of the CRoW.	Section 4.4

Project feature	Description	Section reference
Program	Construction is proposed to commence (pending approvals) in mid-2027, with operation expected to commence in mid-2028.	Section 4.6.1
Construction facilities including temporary accommodation facility	Construction facilities required for the project include: – a temporary accommodation facility located at the intersection of Wompah Gate Road and Tickalara Road – a construction compound facility to stockpile line pipe located on Wompah Gate Road – smaller temporary workspaces at regular intervals along the project site. Use would also be made of APA's existing temporary accommodation facility located on the 'Nockatunga' property on Warri Gate Road approximately 16 km east of Noccundra (approved separately and operating under a material change of use under the Planning Act, and does not form part of the EA application).	Section 4.3
Construction workforce	A peak construction workforce of up to approximately 400 people.	Section 4.7.1
Access tracks/roads	Access to the CRow, construction facilities and resources (including water) would be via existing sealed and unsealed roads, as well as new or upgraded access tracks. Turn-in and turn-out areas are proposed along the project site.	Section 4.7.2
Water requirements	Non-potable water Approximately 280 megalitres (ML) of non-potable water would be required for construction and hydrotesting. Water would be sourced from a combination of existing bores and water take points on the Wilson River, and where insufficient water supply or water quality is found, new drilled bores will be proposed. Potable water Approximately 17 ML of potable water would be required for the temporary accommodation facility.	Section 4.7.3
Crossings	Watercourses The project would cross: – Wilson River by trenchless construction methods – named/major watercourses – about 15 trenched crossings – minor watercourses/drainage lines – various by trenched crossings. Roads The project would cross: – sealed roads – four crossings by trenchless construction methods (Eromanga Road, Bundeena Road, Innamincka Road and Warri Gate Road) – formed/named (public) roads – four trenched crossings (Wompah Gate Road x 2, Tickalara Road and Buckaroola Road) – tracks – about 115 trenched crossings – unmade (gazetted) roads – seven trenched crossings.	Section 4.5.3





APA



APA Group
Bulloo Interlink Pipeline

**The project -
key construction features**

Project No. 12661648
Revision No. 0
Date 15/07/2026

Figure 4.2

4.2 Permanent project infrastructure

4.2.1 Pipeline

Design requirements

The pipeline would be designed, constructed, operated, maintained and decommissioned in accordance with:

- AS 2885 series of standards
- APGA Code of Environmental Practice (APGA, 2022)
- conditions of the EA under the EP Act
- pipeline licence requirements under the P&G Act.

Features

The pipeline would be constructed of high-strength steel pipe with a wall thickness suitable for transporting gas at high pressures. It would be installed underground. The key features are listed in Table 4.2. These would be subject to further refinement during detailed design.

Table 4.2 Key pipeline features

Feature	Description
Pipeline diameter	The pipeline would consist of 18 m long lengths of DN700 pipe, which has an outside diameter of 711 mm.
Wall thickness	The pipeline wall would be 14.1 mm thick for most of the length, with the exception of areas where conditions and AS 2885 dictate a need for heavier wall sections (e.g. within and adjacent to facility compounds). A total length of about 1 km would be 18.7 mm thick.
Pipeline Design life	50 years
Pipeline material	API 5L Grade X70 steel pipe.
Minimum pipeline burial depth from the surface (depth of cover)	The minimum depth from the top of the pipeline to ground level would be 750 mm, increasing to a minimum of 1,200 mm for road crossings and a minimum of 1,500 mm for watercourse crossings. The proposed likely minimum depth of cover is 10 m for the crossing under the Wilson River. The final depth of cover would be determined during detailed design in consultation with landholders and asset owners, taking into consideration existing and future land uses, ground conditions, soils and crossing types, and the requirements of AS 2885.
Gas type	Natural gas compliant with AS 4564:2020 <i>General-purpose natural gas</i> .
Capacity	The pipeline would have a nominal capacity of up to 800 terajoules per day (TJ/day).
Yield strength	The pipeline would be designed with a specified minimum yield strength of 483 megapascals.
Operating pressure	The pipeline would be designed to operate at a maximum allowable operating pressure of 15,320 kilopascals.
Corrosion protection	Pipeline coating The pipeline will be coated with an external coating of a dual layer of fusion bonded epoxy. Pipe used for trenchless crossings are overcoated with up to a 2 mm thick abrasive resistant overlay. Cathodic protection Additional electronic corrosion protection will be provided, consisting of surface facilities and a buried anode bed, designed and operated in accordance with AS 2832.1:2015 <i>Cathodic protection of metals: pipes and cables</i>, and AS 2885.3:2022 <i>Pipelines — Gas and liquid petroleum, Part 3: Operation and maintenance</i> (AS 2885.3:2022) (see section 4.2.2).

4.2.2 Surface infrastructure

Beginning of line facility

A beginning of line facility would be located at the tie-in point where the project connects with the SWQP on the southern side of the existing Meadows scraper station, (PPL 24, EPPG00568413) (Figure 4.1), about 13 km north-west of Eromanga Road. The main purpose of the facility would be to safely control the flow of gas from the SWQP into the Bulloo Interlink Pipeline. The facility, which would act as the entry point ensuring gas enters the new pipeline in a controlled and secure way, would include equipment to measure gas pressure and quality, regulate flow rates, and allow for isolation of the pipeline when needed for maintenance or emergencies.

The facility would include the following equipment:

- connection to the SWQP via above ground tie-in flange connections
- pipeline inspection launcher and valves to facility pipeline inspection and clearing
- gas filtration units to remove impurities
- flow measurement instruments
- main line isolation valve
- pressure regulation equipment
- overpressure protection systems
- power generation and supply infrastructure (solar, and battery storage).

An indicative layout for the facility is shown on Figure 4.3. The facility would expand the operational footprint of the scraper facility by about 0.1 ha.

Main line valve

A main line valve facility would be located about 107 km from the northern end of the project. The main line valve can be closed to isolate sections of the pipeline and would be used for maintenance or to minimise gas loss in the event of a significant leak or rupture. Equipment at the facility would include:

- valve actuators and control systems
- pressure monitoring instruments
- overpressure protection devices
- communication and control equipment for remote monitoring and operation
- small power supply units (solar panels and battery storage)
- impressed cathodic protection (if required).

The operational footprint would consist of a fenced hard stand area, with dimensions of about 25 m by 25 m, fully contained within the permanent easement, slightly offset from the pipeline (by about 5–8 m). The exact location of the facility would be assessed during detailed design in consultation with the landholder.

A separate fenced pipeline vent would be located within the permanent easement about 100 m from the main line valve. A pipeline vent is used to safely release gas from the pipeline when a section needs to be isolated or depressurised during maintenance, repairs, or emergency situations. The pipeline vent allows gas to be removed in a controlled way, reducing pressure and minimising risk.

Temperature control station/main line valve

A temperature control station, including a main line valve, would be located within the permanent easement about 4 km north of the southern end of the project site at the Qld–NSW border. The temperature control station helps manage gas pressure before it reaches the end-of-line facility. It uses a series of control valves arranged in parallel to reduce upstream pressure, which in turn lowers the amount of heating needed downstream. The station would also include:

- main line valve (with equipment as described above)
- communication and control equipment for remote monitoring and operation
- small power supply units (solar panels and battery storage)
- cathodic protection.

A separate pipeline vent would be located within the permanent easement about 100 m from the temperature control station.

Pipeline marker signs

Pipeline marker signs would be installed along the pipeline alignment in accordance with AS 2885, to indicate the presence of the pipeline and reduce the risk of inadvertent damage. Marker signs would be placed so that at least one sign would be visible at any location along the corridor, with a typical spacing of about 500 m.

Corrosion protection system

Corrosion protection is required to protect the buried pipeline from external corrosion. The pipeline's primary corrosion protection would be provided by the external coating applied during the manufacturing process.

Supplementary corrosion protection would be provided by a cathodic protection system, which uses a low-voltage direct current circuit between the pipeline and buried anode beds to prevent external corrosion. The cathodic protection system would comprise:

- Anode bed – a buried anode bed, about 20 m long and 2 m wide, offset from the pipeline by about 200 m and located at the beginning-of-line facility. Surface infrastructure at the anode bed would be limited to a junction box mounted on a galvanised steel upstand and a vent pipe.
- Test points – cathodic protection test points at intervals of about 2 to 5 km along the pipeline, within the permanent easement, to monitor the electrical potential along the pipeline. Each test point would consist of a small box mounted on a galvanised steel or aluminium post about 1.2 m high, with cables routed internally and connected directly to the pipeline.

Power and telecommunications

Power supply to the beginning-of-line facilities and the cathodic protection system would be via connection to the mains electricity supply (where available) or solar power.

Communications would be provided by fixed satellite dishes or existing communication networks.

Access tracks

To facilitate access to the permanent easement and facilities, a new access track is proposed at the beginning-of-line facility at KP 0. As shown in Figure 4.1 existing access tracks are also required to be upgraded to provide lateral access to the permanent easement.

4.3 Construction facilities

4.3.1 Construction compound site

A construction compound for stockpiling line pipe is proposed to be located on Wompah Gate Road near the southern end of the project site, about 300 m north of the Qld–NSW border, and 2.1 km west of the project site.

The site would support the main pipe receipt and laydown area and associated amenities to support the stockpiling of the coated line pipe and subsequent load out. The compound will be used until all pipe is loaded out to the CROW. The location of the facility is shown on Figure 4.2.

4.3.2 Temporary accommodation facility

A temporary accommodation facility is proposed to be located at the intersection of Wompah Gate Road and Tickalara Road, about 7.5 km west of the project site, providing temporary accommodation for up to 400 people and would include:

- individual accommodation rooms, kitchen and dining facilities
- offices, staff amenities, retail store and recreational facilities
- first aid and laundry facilities
- water supply infrastructure, including a water treatment facility to process bore water for drinking, water storage tanks for ablution and amenity facilities, and a 20 kL water tank for bushfire response
- vehicle parking
- wastewater treatment plant and spray irrigation area (described below).
- vehicle washdowns
- maintenance areas
- bunded fuel and hazardous material storage and refuelling area.

Additional temporary accommodation is provided at the existing temporary accommodation facility located on the 'Nockatunga' property on Warri Gate Road approximately 16 km east of Noccundra (approved and operating under a material change of use under the Planning Act).

4.3.3 Temporary workspaces

Various additional work spaces will also be required, including as associated with the HDD at the Wilson River, including pipe stringing area.

4.4 Land requirements

A summary of the project's indicative land requirements and approach to acquisition of the permanent easement is provided in the following sections. Further information about the land requirements, and the potential land use and property impacts of these requirements, is provided in section 7.3.

4.4.1 Permanent land requirements

An easement grants a pipeline licensee the legal right to access land to construct, operate (including maintaining) and decommission a pipeline. It also allows the licensee to regulate activities within the easement for the ongoing safety and reliability of a pipeline.

An easement is registered on the land title and remains on the title following any future change in land ownership/lease arrangements. A nominal easement width of 30 m is proposed.

It is estimated that about 750 ha of land would be permanently required to operate the project, with the majority (approximately 94.5%) located within the permanent easement. A smaller portion (approximately 41 ha) would be occupied by surface infrastructure, including retained access tracks.

Easement acquisition

APA is actively engaged in easement negotiations with landholders along the proposed alignment, in accordance with the P&G Act. The focus is on reaching mutually agreeable outcomes that address key matters such as the preferred pipeline alignment, compensation and construction arrangements tailored to individual landholder needs.

APA is committed to working collaboratively with landholders to understand both current and reasonably foreseeable future land uses. This approach for the project is designed to take into account landholder requirements, supporting practical and sustainable long-term outcomes for both parties.

4.4.2 Temporary land requirements (construction only)

In addition to the project's anticipated permanent land requirements (mainly consisting of the permanent easement), some land would be required during the main construction works described in section 4.5.

These areas would be required for:

- areas within the CRoW located outside the permanent easement (see section 4.5.1)
- construction facilities (including construction compound sites, temporary accommodation facility and additional workspaces) (see section 4.3)
- temporary access tracks and facilities.

About 786.27 ha of land would be required for temporary use during construction only. A summary of the estimated temporary land requirements during construction, which are in addition to the permanent land requirements, is provided in Table 4.3.

Areas required temporarily for construction would be reinstated or rehabilitated following construction unless otherwise agreed with the landholder or asset owner, or as required under an approval.

Table 4.3 *Estimated temporary land requirements*

Construction infrastructure	Approximate area required (ha)
Areas within the CRoW outside the permanent easement	233.63
Temporary accommodation facility (Tickalara Road)	22.01
Construction compound facility near Wompah Gate Road	16
New access tracks required for construction only	464.04
Other temporary workspaces	50.59
Total	786.27

4.5 Indicative construction methodology

4.5.1 Site establishment

The following site establishment activities would be undertaken prior to the commencement of main construction works.

Survey and fencing

Survey and fencing works would be completed prior to the commencement of the main construction works. Surveyors would mark the extent of the clearing limits.

Fencing crews would be mobilised to install temporary gates and fences where required. Installed gates and fences would enable the movement of the construction crew across properties whilst protecting livestock. Temporary gateways would be installed as identified through landholder/stakeholder consultation. The CRoW would not be fenced.

Clear and grade

Clearing and grading would be carried out to provide a level, safe and efficient construction surface and establish the CRoW. The CRoW would typically be 40 m wide to provide adequate space for construction activities, as well as storage of topsoil and subsoil. It would typically be 25 m on the western side of the trenchline and 15 m on the eastern side. A typical layout is shown in Plate 4.1.

The CRoW has been narrowed where practicable to avoid or minimise impacts to identified environmental, heritage and land use constraints. The extent of narrowing depends on site-specific conditions and constraints.

Topsoil and vegetation within the CRoW and construction facilities would be stripped and cleared. Stripped topsoil and cleared vegetation would be stockpiled separately along the edges of the CRoW or in temporary workspaces and used as part of the site restoration process. Breaks would be left in stockpiled vegetation and topsoil for fence lines, tracks and watercourses.

Earthworks would be undertaken to provide a level working area for the construction compound and temporary accommodation facility. Gravel surfacing would be used to provide an all-weather surface where required. Erosion and sediment controls would be installed and perimeter fencing erected to separate construction areas from publicly accessible areas.

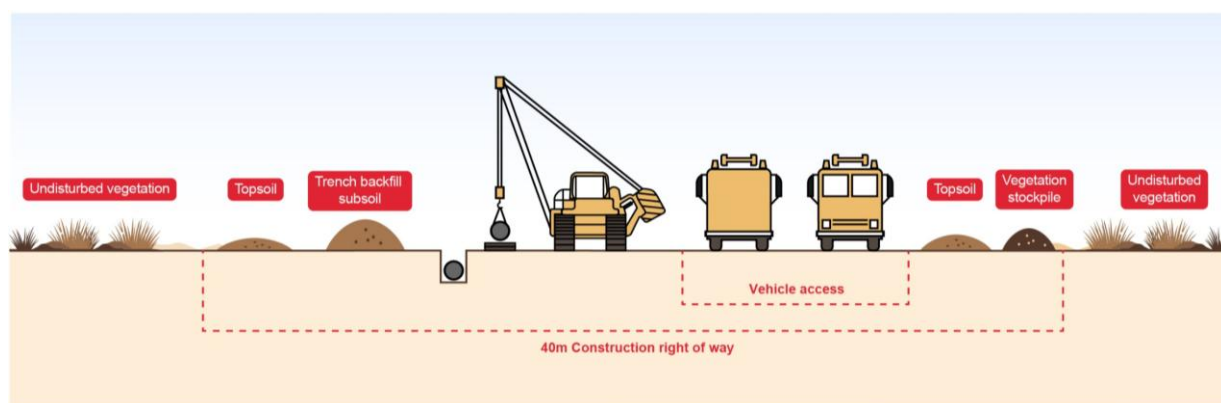


Plate 4.1 Typical CRoW layout

Establishing the temporary accommodation facility

Construction activities associated with establishing the temporary accommodation facility would include:

- site preparation:
 - site levelling and compaction
 - electrical installations (generators and related equipment) for powering the facility
 - plumbing installations.
- mobilisation and building installation:
 - prefabricated demountable accommodation buildings would be trucked to site
 - buildings would be placed onto prepared areas using forklifts.
- site finishing:
 - demobilisation of trucks, machinery and equipment not required during the main project construction works
 - installation of diesel generators, wastewater treatment facilities and water tanks
 - establishment of the wastewater treatment plant, spray irrigation pipelines piping and irrigation area.
- rehabilitation and demobilisation once construction is complete.

Construction materials and supplies (including food and services for temporary accommodation facility) would be sourced from relevant suppliers and transported to site. APA would use local suppliers where practicable.

Access tracks

Access tracks between main road corridors and the CRow would be up to 15 m in width. Where possible, existing access tracks would be used, with upgrades made where required. Clearing of riparian vegetation would be avoided where access tracks cross watercourses, although trimming of overhanging vegetation may be required in some locations.

Construction of the proposed access tracks would generally consist of:

- clearing and grading the tracks
- installing fence gates or grids where required
- stockpiling of cleared vegetation and topsoil
- earthworks to specified cut/fill levels, if required
- placement and compaction of gravel, if required
- installation of drainage (e.g. table drains and turnout drains), if required.

Upgrades to existing access tracks may include, but are not limited to:

- widening at intersections to allow heavy vehicle movements
- grading and watering the existing road surface as required to remove undulations for suitable compaction
- placing gravel on the tracks in erosion prone or low-lying areas, where required
- repairing existing table drains and turnout drains as required for effective water management.

4.5.2 Pipeline installation

Pipeline construction involves a repetitive sequence of activities, which are planned, scheduled and integrated to function as a continuous production process. An overview of the key activities is provided below.

Stringing and bending

Stringing involves placing pipe sections along the CRow in preparation for welding. The pipe sections would be laid end-to-end on skids to protect the coating from damage (see example at Plate 4.2).

The pipe sections would be typically transported from stockpile areas to the CRow using extendable semi-trailers. Once on site, excavators, side-booms, or cranes equipped with lifting hooks or vacuum lifters would unload and position the pipe sections adjacent to the marked trench line in a specific sequence. Where required, pipe sections would be bent using a hydraulic bending machine to accommodate changes in elevation or alignment direction.



Plate 4.2 *Example of pipeline stringing (source: APA 2026)*

Welding, testing and coating

Specialised construction crews would weld pipe sections together manually or using an automated welding process. Pipe sections would be welded into strings of up to about 1,200 m in length, allowing for stock and landholder access breaks where required.

Each weld would be subjected to non-destructive testing to check for compliance to specification and the integrity of each weld. Non-compliant welds would either be repaired or replaced.

Following welding, the weld joints would be cleaned by grit blasting with garnet (a naturally occurring inert substance). An external coating (compatible with the factory applied external coating) would be applied to the weld to prevent corrosion.

Trenching

Most of the pipeline would be installed by open trenching methods. Trenchless construction methods would be used at nominated crossings as described in section 4.5.3.

Depending on ground conditions, a trench about 1.0 m wide would be dug using wheel or chain trenchers, rock saws, or excavators (see example in Plate 4.3). The excavated subsoil (trench spoil) would be temporarily stockpiled along the edge of the CRoW, kept separate from the topsoil.

Rock hammers may be required to facilitate excavation in hard rock. It is considered unlikely based on available data that blasting would be necessary but the requirement for blasting would be confirmed through geotechnical investigations carried out to support detailed design and construction planning. If blasting is required, a blast management plan would be developed before any blasting activities begin. All blasting activities would be performed by qualified personnel in compliance with relevant legislation and standards, the project approval and the blast management plan.

The daily trenching distance would vary depending on terrain, equipment used and weather conditions, approximately 50 km of trench may be open at any time. Typically, about 2.5 km can be completed per day under favourable conditions.

Breaks in the trench (or suitable alternatives) would be left to allow for stock and wildlife crossings, and to facilitate agricultural vehicle movement where needed, in consultation with landowners. Measures to reduce potential impacts on wildlife during construction (e.g. animal entrapment) would be included in the biodiversity management plan, which forms part of the CEMP. Where required, APA would also coordinate with landowners to manage stock access across the CRoW.



Plate 4.3 *Example of open trenching and spoil placement (source: APA 2026)*

Lowering in and backfilling

Following trench excavation, the welded pipe strings would be lifted off skids and lowered into the trench using side-boom tractors (see example in Plate 4.4). As each welded pipe string is lifted, the pipe coating is inspected and tested for any defects for integrity. After lowering in, the strings are welded together (a 'tie-in') in the trench.

In some rocky areas or where pipe coating integrity might be at risk, it may be necessary to protect the pipe coating from damage by placing a layer of padding material in the trench before lowering in the pipe string and also covering the pipeline afterward (a process known as shading). Padding machines produce this material by mechanically sieving the excavated trench spoil to remove rocks and coarse debris, depositing the fine material at the base of the trench and over the pipe. While this method reduces the need to import padding material, in some cases certified weed- and disease-free material may still be brought in from other locations.

Where required, impermeable trench breakers would be installed prior to backfilling to control lateral water movement along the trench. These trench breakers are typically constructed from sacks filled with soil, sand, stabilised sand, or spray-applied polyurethane foam. They are commonly used in sensitive environmental areas such as adjacent to watercourses, wetlands, steep slopes, or where drainage patterns change.

After installation of the pipeline and any necessary protections, the trench would be backfilled with the trench spoil and compacted to minimise the risk of ground settlement. The displaced spoil would be evenly spread over the trench line before reinstatement of any topsoil that (see section 4.5.5). During backfilling, pipeline identification marker tape would be installed, where mandated by the design at the appropriate depths to aid future location and maintenance.



Plate 4.4 *Example of lowering in the pipeline using side-boom tractors (Source: APA 2026)*

Hydrostatic testing

Once the pipeline has been installed, it would be hydrostatically tested (hydrotested) in accordance with AS 2885 to prove integrity. Hydrotesting would involve filling sections of the pipeline with water and pressurising it to the specified test pressure. Hydrotesting, including the time required to fill the pipeline with water, is expected to take about five to 10 days per test section. The test pressure would be sustained for the required period in accordance with the AS 2885 test parameters.

Biocides and corrosion inhibiting chemicals, in the form of oxygen scavengers, may be added to the hydrotest water depending upon the quality of the available water and the length of time the water is required to be held in the pipeline. Hydrotest water would be subject to testing and beneficially reused following treatment (if required) or disposed of in accordance with the waste management practices described in Appendix F.

Once dewatered the pipeline would be cleaned and dried. Pipeline drying using pipeline inspection materials propelled by dry air remove residual moisture and ensure gas quality is maintained to specification.

4.5.3 Crossings methods

Most watercourse, road and track crossings would be undertaken using standard trenching methods. At this stage of the design and construction planning process, it is proposed to utilise trenchless construction techniques, such as HDD and under boring, for the following crossings:

- watercourses – Wilson River
- roads – Eromanga Road, Bundeena Road, Innamincka Road and Warri Gate Road.

These crossing methods, which are subject to further investigation during detailed design, are described below.

Trenched crossings

With the exception of the Wilson River, watercourse crossings would be undertaken when the watercourses are dry or pooled using standard trenching methods as described in section 4.5.2. For these crossings, the banks of watercourses would be cleared and graded to enable a suitable slope and access for construction equipment. Watercourse bed and bank material and trench spoil would be excavated and stockpiled separately on either side of the watercourse. If pooled water is present, appropriate dewatering or flow diversion methods would be implemented, depending on water levels at the time. Once the pipe is installed the trench would then be backfilled with native streambed spoil.

At selected, more environmentally sensitive locations, the CRoW width would be reduced to between 20 m and 35 m. This would reduce impacts on the watercourse and the riparian zones. Additional temporary working spaces outside the watercourse and CRoW would be needed on both sides of these watercourses for temporary storage of topsoil, subsoil, watercourse bed and bank material and to provide additional working area not available at the watercourse.

Measures to minimise the potential for water quality and watercourse stability impacts would be implemented in accordance with the soil and water management plan in the CEMP.

Crossing unsealed roads and tracks would be undertaken using standard trenching methods. Construction of these crossings would be undertaken in consultation with the requirements of asset owners. Measures to minimise the potential for road access impacts would be implemented in accordance with the traffic and access management plan in the CEMP.

Trenchless crossings

Horizontal directional drilling

HDD is used to install pipelines in locations where open trenching is impractical or where minimising disturbance to surface environmental features, land use, or physical obstacles is necessary. HDD is proposed for the Wilson River to avoid and minimise impacts on sensitive environmental features and habitats.

This surface-launched technique uses a specialised HDD rig to drill an inclined pilot hole, which is carefully steered along a predetermined path from the entry point to a designated exit point on the opposite side of the crossing. Once the pilot hole is complete, it is reamed to a larger diameter to accommodate the pipeline. A prefabricated pipe string, cut to the required length for the crossing, is then pulled back through the borehole.

Throughout the process, drilling fluids (primarily water mixed with bentonite) are used to transport drill cuttings, stabilise the borehole and lubricate the drill head. Plate 4.5 shows a typical process and Plate 4.6 shows a typical entry and exit point workspace layout.

While HDD avoids direct impacts to the surface features being crossed, it introduces additional environmental considerations. These include managing sediment and drilling fluids, handling waste materials and clearing land for entry and exit pads as well as pipe stringing areas. Because HDD operations typically need to be conducted continuously, noise impacts, especially during quieter nighttime hours, require careful mitigation.

The method also necessitates vehicle access and additional equipment, which may involve creating temporary workspaces or new access tracks. To address these challenges, site-specific management plans and procedures are usually developed to minimise environmental and community impacts.

Other trenchless methods

Other trenchless methods include auger boring, pipe jacking, pipe hammers, track bores, slip bores, guided bores and micro tunnelling. These methods typically require the establishment of launch and receive bell holes on either side of the crossing at the required depth as the path of the bore must be on a straight trajectory.

The crossing distance achievable with these methods is typically limited when compared with HDD. However, as they are launched at final depth, other trenchless methods can be completed in closer proximity to the crossing feature resulting in a shorter crossing length.

These trenchless methods are generally suitable for road crossings and would be proposed for crossings at Eromanga Road, Bundeena Road, Innamincka Road and Warri Gate Road as applicable.

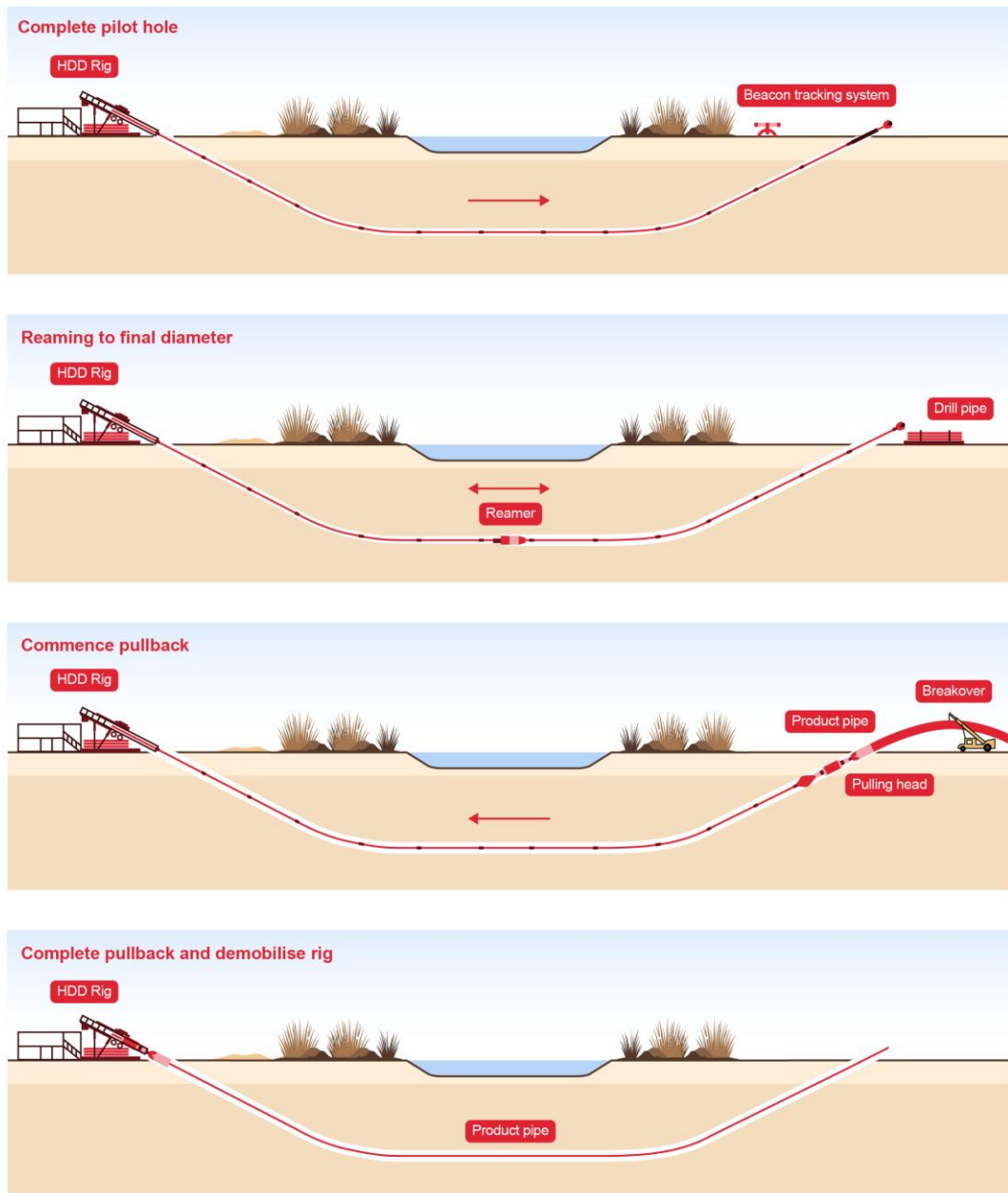


Plate 4.5 Indicative HDD process

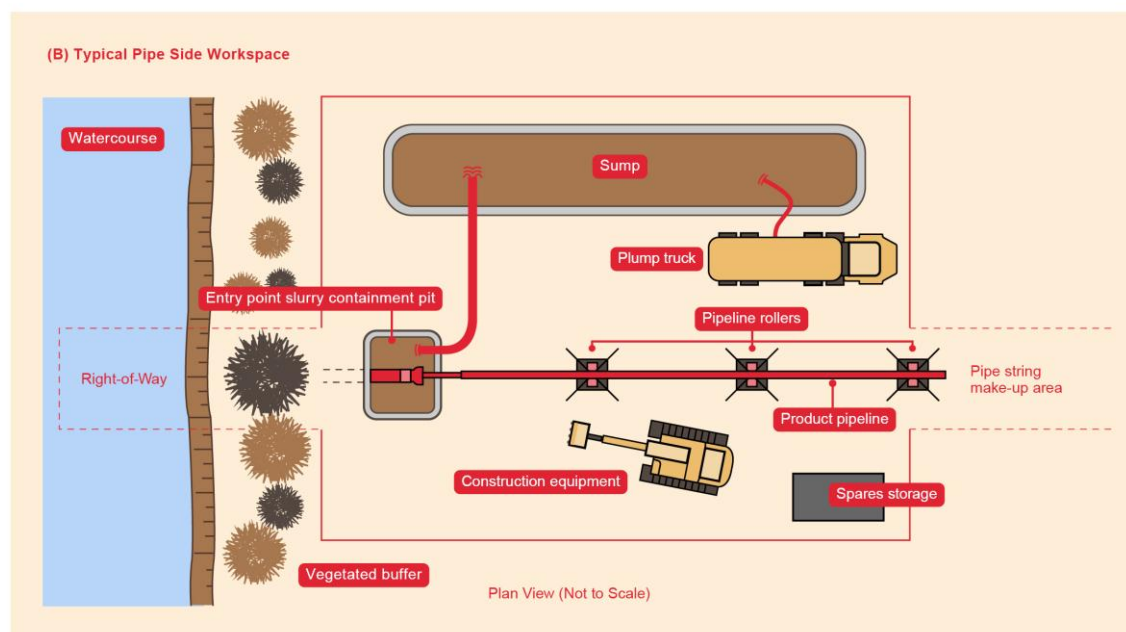
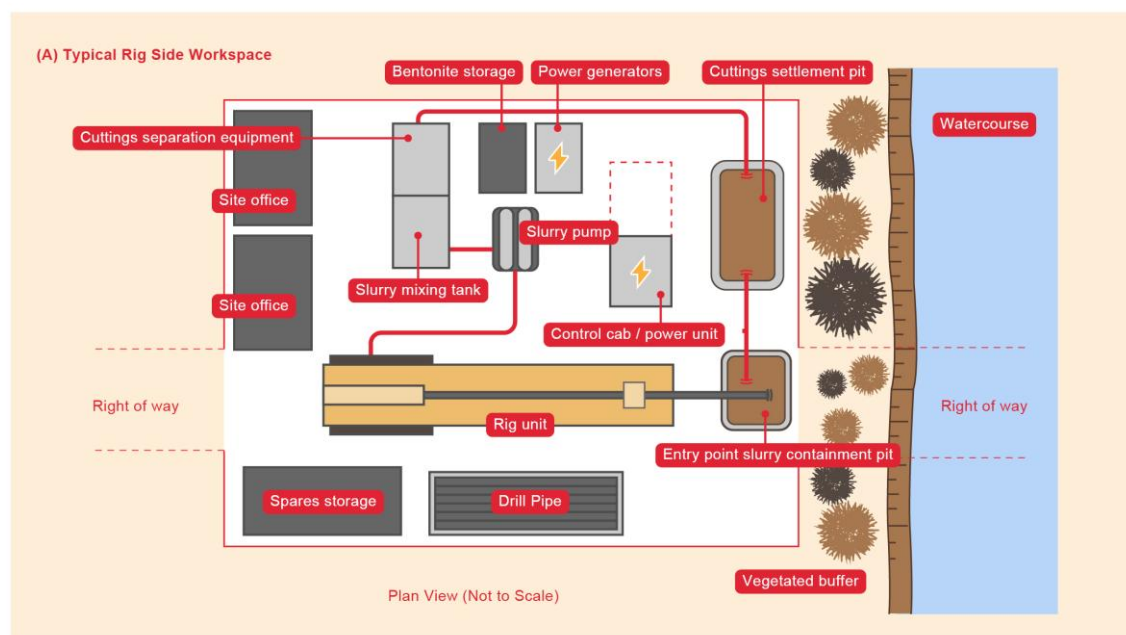


Plate 4.6 *Indicative workspace layout*

4.5.4 Surface infrastructure

The indicative approach to constructing the proposed surface infrastructure (see section 4.2.2) is described below.

Start and end of line facilities, valves and temperature control station

Sites for the proposed facilities would be levelled and covered with gravel. Pipe support and structural footings would be installed and prefabricated equipment brought to site and installed in the appropriate positions. Facilities would be connected to the pipeline following completion of pipeline hydrotesting.

Cathodic protection system

The cathodic protection units would be typically mounted to an instrument stand or similar frame on a concrete foundation. The buried anodes beds would be installed in a trench or in vertical boreholes and backfilled with carbon backfill and then natural material with anode cables routed through a trench to the junction box at the facility.

4.5.5 Reinstatement and rehabilitation

Reinstatement and rehabilitation

As soon as practicable after pipe laying and backfill, the CRoW and ancillary facilities would be cleared of all construction equipment, materials and waste, stabilised and rehabilitated. The objectives of the rehabilitation works would be to:

- return the CRoW land to as close as possible to its pre-existing state within a reasonable timeframe
- re-establish topsoil cover and stability as soon as possible
- re-establish pre-existing topographic contours and drainage patterns
- establish erosion control measures (e.g. contours banks, filter strips) in erosion prone areas
- provide suitable conditions to allow vegetation (where it was present) to re-establish.

Reinstatement and rehabilitation would include the following typical activities:

- demobilising or relocating construction compounds and other ancillary facilities
- removing all equipment, materials and waste from the project site
- removing temporary fencing and signage
- decommissioning and reinstating site access roads that are no longer required
- re-contouring consistent with the surrounding landform and drainage patterns
- installing erosion controls, where required
- reinstatement of topsoil
- lightly scarifying disturbed areas to promote vegetation growth
- resspreading of cleared vegetation evenly over the CRoW allowing for natural regeneration/revegetation of vegetated areas
- reinstating habitat features (e.g. logs and rocks) where required in consultation with landholders
- managing stock access where required (in consultation with landholders) in support of revegetation.

The rehabilitation methodology would be developed in consultation with landholders and in consideration of EVs. The aim of rehabilitation would be returning disturbed areas not required for operation to their former use and making them suitable for existing uses (where present).

Following the reinstatement and rehabilitation of the pipeline easement, marker signs would be installed in accordance with *AS 2885.1:2018 Pipelines – Gas and liquid petroleum, Part 1: Design and construction* to delineate the pipeline.

Commissioning

The following commissioning activities would be undertaken in accordance with the requirements outlined in the P&G Act:

- instrument calibration
- performance testing of all systems, valves and equipment
- pipeline inspection gauge and caliper run to confirm defects caused by construction are not present
- pipeline commissioning, including purging air from the pipeline, and introducing gas under controlled conditions.

A detailed pipeline commissioning program would be prepared and subjected to safety and risk analysis as required.

4.6 Construction program and timing

4.6.1 Program

Construction is proposed to commence (pending approvals) in mid-2027, with operation expected to commence in mid-2028.

Construction is expected to be undertaken in three phases:

- Site establishment works, including establishment of the construction facilities, would take about two months.
- The main construction works are expected to take about eight months. During this phase, the pipeline and surface infrastructure would be installed, and the CRoW and temporary workspaces would be reinstated.
- Hydrotesting and commissioning would take about two months.

There would be breaks where no work would take place following the main construction works and prior to commissioning. This schedule may be optimised during detailed design and once a construction contractor is appointed.

4.6.2 Working hours

The construction workforce would work a 21 days on/nine days off roster or a 28 days on/nine days off roster. During work periods, work is proposed to be undertaken generally during daylight hours (6am – 6pm), seven days a week to:

- reduce the overall construction timeframe of the project, including the length of time that individual receptors are exposed to noise
- maximise the use of the workforce once mobilised to site
- provide flexibility to program a range of work activities.

Out of hours work (6pm to 6am) would also be required as described in Table 4.4 below. These works may be required:

- to minimise disruption to traffic and disturbance to surrounding landholders
- as a result of the type of construction equipment, processes and methodologies
- for the safety of the construction workforce and community
- to minimise the potential for environmental impacts.

Out of hours work would be undertaken in accordance with an out of hours work protocol that would be prepared as part of the CEMP.

Table 4.4 Specified activities that may be undertaken outside project working hours

Specified activity	Justification
Trenchless construction methods	Once trenchless construction methods (e.g. HDD) are operating, they must keep running to maintain the borehole and drilling fluid integrity until drilling is complete. This may need to occur out of hours.
Hydrostatic testing and drying	Hydrostatic testing needs to be completed as a single process and cannot cease midway as the pipeline needs to be maintained at pressure and monitored during the entirety of the testing procedure.
Non-destructive testing	Some testing works may be completed outside standard working hours to minimise the duration the pipeline trench remains open.
Out of hours deliveries	Delivery of construction plant, equipment and materials that require transport outside recommended standard working hours (e.g. deliveries by oversized overmass trucks).
Maintenance of plant and equipment	Plant and equipment maintenance may need to be undertaken outside project working hours for machinery can operate efficiently.
Emergencies/unexpected circumstances	Emergency work to avoid the loss of life or damage to property, or to prevent environmental harm.
Fauna spotter-catcher activity	Open trenches inspected by fauna spotter-catcher prior to works commencing each day.
Work agreed to by potentially affected residents and work with no potentially affected residences	Work that does not result in noise affected residences or work carried out in accordance with hours and noise limits specified in any negotiated agreements with residents (owners and occupiers), developed in consultation with these residents.

4.7 Construction resources and access

4.7.1 Workforce

The project is expected to require a peak construction workforce of about 350 to 400 personnel for about eight months during the main construction works phase (see section 4.6.1).

4.7.2 Traffic and access

Transport and access requirements involving access to and from the CRoW and the construction facilities include:

- delivery of pipe to the construction facilities, and transport to the CRoW
- delivery and transport of construction plant, equipment and materials to and from the construction facilities and the CRoW, including components for surface infrastructure
- transport of water from water source/s to storage areas at the construction facilities and to the CRoW, roads and access tracks
- transport of fuel to the construction facilities and CRoW
- workforce movements, including transport of the workforce to/from temporary accommodation facilities and work areas.

Indicative access routes are depicted in Figure 4.1. Deliveries from the wider region would use the regional public road network to link with these access routes. Construction vehicle movements would comprise both heavy and light vehicles and would vary across the project site depending on the activity being undertaken, logistics and location.

For further information about proposed arrangements and traffic numbers, refer to section 7.5 and Appendix G.

4.7.3 Water

Water use

The main uses of non-potable water required during construction would include:

- dust suppression for pipe stockpiles, access tracks and the CRoW (quantity would vary according to weather conditions)
- HDD as a component of drilling fluid
- hydrotesting.

Preliminary estimates indicate a total of about 279.7 ML of non-potable water would be required for construction (including hydrostatic testing).

Potable water would be required for drinking and ablutions at the temporary accommodation facility.

Water servicing strategy

Approximately 279.7 ML of non-potable water is estimated for use during construction, sourced from a combination of existing groundwater bores and water take points on the Wilson River. Existing dams, where available, may be utilised subject to agreements with landholders and permit requirements.

Source aquifer(s), quality and yields of the existing groundwater bores are to be confirmed. Where insufficient water supply or unsuitable water quality from groundwater is identified, new groundwater bores may be drilled at a nominal spacing of approximately 50 km from each other (subject to appropriate assessments, testing, and approvals).

The project will adopt a flexible approach to water sourcing during construction rather than relying on a fixed bore spacing. While a nominal target of one bore approximately every 50 km is used as an initial planning assumption, the final water supply strategy will be determined through on-ground assessment. This will include identification and evaluation of existing bores in the vicinity of the alignment, assessment of their capacity, reliability and suitability for construction demand, and consideration of environmental and land access constraints. Where existing sources are insufficient, the project will optimise between developing additional bores, importing water, or carting from approved external sources, taking into account cost, logistics and regulatory requirements. This adaptive approach ensures that water supply is secured in a practical and efficient manner while minimising unnecessary disturbance and infrastructure development.

The main uses of non-potable water during construction will be:

- dust suppression for stockpiles, access tracks and the CRoW (quantity would vary according to weather conditions)
- horizontal directional drilling (HDD) as a component of drilling fluid
- hydrotesting.

Approximately 13.7 ML of potable water would be used for drinking water and ablutions at construction facilities and temporary accommodation facilities. The potable water would be generated from non-potable water by reverse osmosis (RO) and the RO waste transported to an appropriate facility for disposal.

Potable water

A water treatment plant would be designed and supplied to treat raw bore water for the temporary accommodation facility's potable water requirements. It is anticipated that a RO treatment system would be required to achieve potable water quality standards.

The water treatment system would include, but not be limited to, the following components:

- Supply and installation of water treatment infrastructure, including U-type inline cartridge filtration, ultraviolet (UV) disinfection, reverse osmosis treatment, and chemical dosing systems as required
- Provision of raw water and treated (potable) water storage tanks with sufficient capacity to provide a minimum of three days' water storage for the facility at full occupancy, including appropriate wet-weather protection.

- A water reticulation pump skid to deliver pressurised potable water, with 100% standby (duty/standby) redundancy for all critical pumping equipment.

Potable water would be tanked to work areas.

Wastewater

Wastewater from the temporary accommodation facility would be treated by a suitably designed, manufactured, installed, commissioned and operated aerated wastewater treatment plant, pre-approved or accredited to satisfy the requirements of the *Disposal of effluent using irrigation, Technical Guideline* (Queensland Government, 2020), which provides a risk-based framework for the planning, design, installation and operation of effluent irrigation systems for rural and industrial effluent management. The guideline establishes environmental performance objectives for the use of effluent by irrigation, including the protection of surface water and groundwater, land and soil resources, plant and animal health, public health, resource efficiency and community amenity.

The plant would provide assurance that water quality meets or exceeds secondary treated class B standards for a treatment system with a daily peak design capacity of between 150 EP and 1500 EP; or meets or exceeds secondary treated class C standards for a treatment system with a daily peak design capacity of less than 150 EP.

Hydrotesting operations shall conform to the requirements of relevant legislation and AS/NZS 2885.5. If required to be discharged, discharge of hydrotest water would be to land where it meets acceptable standards and is released in a way that does not result in visible scouring or erosion or pooling or run-off or vegetation die-off.

4.7.4 Power and telecommunications

Power required for construction activities, including at the construction compound and temporary accommodation facility, and for other activities within the CRoW (e.g. welding and other plant operations) would also be supplied by diesel generators.

Temporary accommodation facilities will be progressively relocated along the alignment in line with the advancing work front. The primary camp is expected to be established initially in the north, reaching peak occupancy at the Nockatunga² location before being demobilised and re-established further south at Tickalara as construction progresses. Power generation infrastructure, including diesel generators, will be deployed in conjunction with each active camp to meet workforce accommodation and operational energy requirements. As such, generator allocation will not be fixed to a single location but will move with the camp to support workforce needs as construction advances.

The temporary accommodation facility would be equipped with three 500 kVA generators, with two operating in parallel and one maintained on standby for redundancy and reliability. The two active generators are expected to consume about 6,000L/day on average over the duration of peak capacity.

Diesel would also be used as fuel for construction vehicles, machinery and plant.

It is proposed to store diesel fuel in tank/s at the temporary accommodation facility. Diesel would be stored in accordance with *AS 1940:2017 The storage and handling of flammable and combustible liquids*. Plant and equipment located along the CRoW would be refuelled using a delivery tanker.

It is estimated that about 8.1 ML of diesel would be required during construction, including fuel for vehicles, construction plant and equipment and generators.

Construction vehicles would be fitted with radios (UHF or VHF) for communication between vehicles. The radios would require the installation of temporary repeater towers (approximately 10–30 m high) at intervals along the project site. The towers would be powered by local solar panels. Upon completion of the construction phase, the temporary repeater towers would be removed.

² The Nockatunga temporary accommodation facility is separately approved under an MCU and is not the subject of this EA application.

4.8 Operation and maintenance

4.8.1 Operational activities

Operation of the pipeline is expected to commence in mid-2028 (subject to approvals). The pipeline would be designed to operate with a minimum of operator intervention using a supervisory control and data acquisition (SCADA) system for system sequencing, alarm monitoring and control. The pipeline would be continually monitored to confirm it is operating within the operating parameters. Remotely operated isolation valves would be located at either end of the pipeline, which would automatically close and raise an alarm in the event of an emergency. Odorants would not be used in the pipeline.

A routine operation and maintenance program would be implemented, which would include external coating surveys, ground and/or aerial patrols, repair or replacement of faulty/damaged components, internal cleaning of the pipeline, corrosion monitoring and remediation and easement maintenance.

Aerial and/or ground inspections would include activities such as checking for vegetation encroachment close to the easement, detection of erosion, monitoring of rehabilitation success and detection of weed species. Other maintenance activities may be undertaken infrequently as required, which could include limited areas of excavation around the pipeline. Any excavation of material would be undertaken in a similar manner to construction (i.e. topsoil would be stockpiled separately from trench spoil, and the site would be restored as soon as practical following completion of maintenance works).

Monitoring of the cathodic protection system would be undertaken on a regular basis. The frequency of monitoring would be assessed in accordance with AS 2885.3:2022 during the development of the detailed operating procedures.

Access to the permanent easement would be necessary for inspections and to follow-up issues identified during inspections. Remedial activities for erosion, subsidence and weed management may be required, particularly during the first 12 months following construction. Maintenance activities would be managed in accordance with APA's standard operating procedures to manage and minimise potential impacts as far as practicable.

Regular consultation would be maintained with landholders whose properties are traversed by the pipeline and a 'before-you-dig' system for excavation and locations initiated.

4.8.2 Operational workforce

Operation of the pipeline would require about four personnel consisting of field and control room personnel. It is likely that existing field personnel based in Cobar would manage field activities while the control room personnel would operate from the APA Brisbane office.

Field personnel would be responsible for day-to-day maintenance and patrolling of the pipeline. Control room personnel would remotely monitor and control gas flows into and out of the pipeline via SCADA and coordinate field personnel activities on the pipeline as required.

4.9 Decommissioning

4.9.1 Approach

When a decision is taken to cease operation of the pipeline, decommissioning would be undertaken in accordance with relevant statutory approvals, the legislative requirements of the day (currently the *Petroleum and Gas (Production and Safety) Act 2004* (Qld), relevant Australian Standards (currently AS 2885) and in consultation with relevant regulatory authorities.

It is anticipated at this point in time that decommissioning would involve retiring the pipeline, with the majority of the pipeline expected to remain in place. Leaving the pipeline underground minimises the need to disturb land and re-establish vegetation, which would be required to excavate and remove the pipeline.

Decommissioning an underground gas pipeline in accordance with AS 2885 involves a structured and safety-focused approach as described below.

AS 2885 sets out a structured and mandatory process for the decommissioning (referred to as 'abandonment') of gas pipelines. The standard requires preparation of an abandonment plan, informed by a safety management study and segment analysis. The abandonment plan would set out the technical and procedural steps for managing all risks associated with the decommissioned pipeline. The safety management study would involve a structured risk assessment covering matters such as surrounding infrastructure, land uses, residual gas management, external interference and potential environmental impacts. The abandonment plan and safety management study must demonstrate that risks are reduced to a level that is as low as reasonably practicable (ALARP) and that appropriate controls are in place for the long term.

The abandonment plan must also address the future land use of the pipeline corridor and demonstrate that the decommissioned pipeline would not pose a hazard to people, property or the environment.

The segment analysis involves a detailed evaluation of individual pipeline sections and their characteristics and locations that influence the risk profile. This allows the decommissioning approach to be tailored to the specific conditions and land uses along each section of the pipeline, including where it passes beneath watercourses, roads or other infrastructure.

The management of residual gas is a key technical consideration addressed in the abandonment plan. AS 2885 does not prescribe a single method but requires that the selected approach be justified through risk-based analysis. A range of technically feasible options may be considered, including purging with inert gas, controlled release, vacuum extraction, controlled combustion or other engineered solutions. The method would be determined through the safety management study, taking into account pipeline configuration, residual gas volume, environmental and community considerations, and the regulations and technology available at the time of decommissioning.

4.9.2 Key activities and anticipated resources

In accordance with these requirements (as they currently exist), it is expected that decommissioning would involve:

- leaving the pipeline in place
- drawing down gas remaining in the pipeline as much as possible
- managing residual gas at the tie-in point with the Moomba to Wilton Pipeline in accordance with the abandonment plan (as described above)
- disconnecting the pipeline from all surface facilities, including the cathodic protection system
- removing all surface facilities
- where required by the abandonment plan (as assessed by the segment analysis), sections of the pipeline may be cut, capped and filled to prevent subsidence, which could involve excavating an access hole (known as a 'bell hole') at either end of the section to be filled
- rehabilitation
- long-term monitoring (if required in accordance with the safety management study).

The detail of works required, how and where they would be undertaken, and the approach to management, would be assessed during the decommissioning and safety management study process in accordance with AS 2885 and the regulatory requirements that exist at the time.

Only limited areas would be subject to surface disturbance as a result of decommissioning, including the location of surface facilities and sections where cutting, capping and filling would be required.

It is expected that such works could take up to about a week at each location and involve similar equipment to that used during construction. A workforce of up to about 20 people at a time is expected, over a period of about 12 months with periods of inactivity.

4.9.3 Environmental management

These above processes (including the safety management study, segment analysis and preparation of the abandonment plan in accordance with AS 2885) provide assurance that all activities would be risk-based, systematically assessed and compliant with industry, community and regulatory standards for safety and environmental protection. The structured approach mandated by AS 2885 promotes proactive risk mitigation, stakeholder engagement and environmental management, thereby supporting a safe and responsible transition of the pipeline from operational to decommissioned status.

The approach to environmental management during decommissioning, as assessed by the safety management study, segment analysis and abandonment plan, would be documented in a Decommissioning Environmental Management Plan (DEMP). The plan would be prepared in accordance with relevant statutory requirements and the APGA Code of Environmental Practice (APGA, 2022), and in consultation with relevant regulatory authorities and landholders.

The DEMP would define rehabilitation goals and demonstrate how the rehabilitation would result in a safe, stable and non-polluting landform. Where areas are not being or not intended to be utilised by landholders, rehabilitation would achieve the highest ecological value of the adjacent land use or the pre-disturbed land use.

5. Methodology

5.1 Study area

The study area assessed for EVs includes the full extent of land with the potential to be directly or indirectly affected by the project, including the project site, survey areas and surrounding context.

5.2 Assessment approach

The assessment included a desktop review of publicly-available databases, mapping layers and project information and undertaking field surveys of the EVs within the study area. The desktop assessment and field survey findings were then used to assess the potential impacts of the project on EVs. More detailed scopes of work for technical impact assessments are contained in the reports provided as appendices.

5.2.1 Desktop assessment

Desktop assessments were undertaken to investigate the general nature of the project site, identify potentially relevant EVs and to facilitate an informed approach to field surveys. The desktop assessment incorporated a review of relevant government databases and mapping layers. Databases and desktop mapping utilised during the desktop assessments are summarised in Table 5.1.

Table 5.1 Desktop assessment information sources

Desktop search	Purpose
Commonwealth	
Protected Matters Search Tool (PMST)	The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) PMST search was used to identify MNES protected under the EPBC Act that have the potential to occur within the study area (DCCEEW, 2025a). Data current as of 20 March 2026.
Species Profile and Threats Database (SPRAT)	The DCCEEW SPRAT profiles were assessed to determine habitat requirements and ecology of potentially occurring threatened species (DCCEEW, 2025b).
Directory of Important Wetlands in Australia (DIWA)	The DIWA database was searched to understand if any nationally important wetlands are present within the study area (DCCEEW, 2025c).
Groundwater Dependent Ecosystem (GDE) Atlas	The GDE Atlas was used to identify potential GDEs within the project site and wider desktop search extent (BoM, 2025).
Digital Earth Australia (DEA) Land Cover	The DEA Land Cover map was used to view existing land cover types within the study area (Geoscience Australia, 2026).
Climate Data Online (Bureau of Meteorology (BoM))	The BoM Climate Data Online search was used to access a range of weather observations and climate data (rainfall, wind, temperatures, etc.) for the regions surrounding the study area (BoM, 2026).
State	
Queensland Globe	Queensland Globe was used to view spatial features mapped within the study area (Queensland Government, 2025).
WildNet platform	The Qld Department of the Environment, Tourism, Science and Innovation (DETSI) WildNet platform was searched to retrieve historical records of flora and fauna species previously recorded within the study area (DETSI, 2025b).
Biomaps	The WildNet online database was assessed through Biomaps to identify the location and date of historical records of threatened species within the desktop search extent (DETSI, 2025c). Data current as of 20 March 2026.
WetlandInfo and WetlandMaps	WetlandInfo (DETSI, 2025e) and WetlandMaps (DETSI, 2019) were used to obtain information on, and visualise, catchments and waterbodies in the project site, including lacustrine, riverine and palustrine areas.

Desktop search	Purpose
Queensland Government Open Data Portal	The Queensland Government Open Data Portal was used to access data regarding registered bores, water entitlements and state-controlled culverts within the project site (DLGWV, 2026). Data current as of 1 February 2026.
Water Monitoring Information Portal (WMIP)	The Queensland Government WMIP was used to retrieve streamflow/discharge data for the Bulloo River (Queensland Government, 2026). Data current as of 1 February 2026.
Cultural Heritage Database and Register	The Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism (DWATSIPM) Cultural Heritage Database and Register (DWATSIPM, 2021) was conducted to identify registered cultural heritage sites within the desktop search extent, as well as the relevant Aboriginal parties (Traditional Custodians) for the project site. Data current as of 28 April 2026.
Other sources	
Atlas of Living Australia (ALA) database	The ALA database (2025) was utilised to search and retrieve historical sighting records of threatened flora and fauna species within the desktop search extent. Data current as of 20 March 2026.
Australasian Virtual Herbarium (AVH) database	The AVH database (2025) was used to retrieve historical records of flora species previously collected in the vicinity of the desktop search extent. Data current as of 20 March 2026.

5.2.2 Field surveys

A series of ecological field surveys were undertaken within the survey area to characterise terrestrial and aquatic ecological values, verify desktop assessment outcomes and inform the identification of conservation-significant species, habitats and potential constraints.

Five field surveys have been undertaken within the survey area:

- post-wet season aquatic ecology survey undertaken from 6 to 17 July 2025
- preliminary targeted terrestrial ecology survey undertaken from 30 July to 11 August 2025
- targeted terrestrial ecology survey undertaken from 6 to 15 October 2025
- pre-wet season aquatic ecology survey undertaken from 7 to 17 October 2025
- targeted terrestrial ecology refinement survey for hollow-dependent species undertaken from 17 to 22 July 2026.

The combined terrestrial ecology survey effort included:

- quaternary vegetation assessments (confirmation of REs, GDEs and threatened ecological communities (TEC))
- habitat assessments for flora and fauna species (including potential breeding habitat for threatened species)
- diurnal searches for secondary traces
- bird census surveys and call playbacks for threatened species
- remote camera trapping, ultrasonic detectors (Anabat) and acoustic detectors (AudioMoth and BAR V2)
- waterbody watches and representative receiving environment assessments
- rapid weed assessments
- targeted large-tree and hollow transects, driving spotlight transects and drainage feature crossings.

The combined aquatic ecology survey effort included:

- aquatic habitat assessments
- aquatic flora surveys
- water quality measured in situ
- sampling of macroinvertebrates, fish communities and freshwater turtles.

5.3 Assessment criteria

A risk-based approach has been adopted to manage the potential environmental impacts of the project. This process involved identifying environmental impacts from construction, operational and decommissioning activities throughout the project and:

- assessing the impacts using a risk matrix to determine the likelihood and consequence and consequent risk level
- identifying the mitigating factors and controls to determine the residual risk.

The objective is to apply the necessary management actions to reduce the level of risk to ALARP.

The risk matrix shown in Table 5.2 was used to assess the potential frequency or likelihood of the event occurring and evaluate the severity of consequences if the event was to occur.

The descriptors for each likelihood rating are shown in Table 5.3 and consequence ratings in Table 5.4.

Table 5.2 Risk matrix

Likelihood		Consequence				
		Minimal	Minor	Significant	Major	Catastrophic
		1	2	3	4	5
Frequent	5	Low	Moderate	High	Extreme	Extreme
Occasional	4	Low	Low	Moderate	High	Extreme
Unlikely	3	Negligible	Low	Moderate	High	High
Remote	2	Negligible	Negligible	Low	Moderate	High
Rare	1	Negligible	Negligible	Negligible	Moderate	Moderate

Table 5.3 Likelihood ratings

Level	Descriptor	Description
5	Frequent (many times in 1 year)	Expected to occur on a regular basis and many times.
4	Occasional (every 2 years)	May occur occasionally or in many circumstances.
3	Unlikely (every 5 years)	Unlikely to occur but possible when certain circumstances prevail.
2	Remote (every 20 years)	Not anticipated but may occur if certain abnormal circumstances prevail.
1	Rare (every 50 years)	Conceivable, but has not been known to arise previously.

Table 5.4 Consequence ratings

Level	Descriptor	Description
5	Catastrophic (permanent and irreparable impact)	One or a combination of the following consequences: – offsite and impact is widespread (>1 ha) – unable to be remediated – impact is irreversible or lasts >10 years.
4	Major (temporary but irreparable impact)	One or a combination of the following consequences: – offsite and impacting >1 ha – able to be remediated with difficulty – impact continues for <10 years.
3	Significant (permanent but repairable impact)	One or a combination of the following consequences: – offsite and impacting <1 ha – able to be remediated with some difficulty – impact continues for <5 years.

Level	Descriptor	Description
2	Minor (temporary and repairable impact)	One or a combination of the following consequences: – onsite and impacting >1 ha – able to be remediated easily – impact continues for <1 year.
1	Minimal (negligible/no damage)	One or a combination of the following consequences: – onsite and impacting <1 ha – no remediation needed – impact continues for <1 week.

6. Stakeholder engagement

6.1 Pre-lodgement

A pre-lodgement meeting was held with APA, GHD and DETSI on 11 August 2025.

6.2 Landholder consultation

Since early 2025, APA has undertaken early engagement activities on the project including:

- direct engagement with affected landholders along the preferred pipeline alignment, and construction compound and temporary accommodation facility, by letters, phone calls and/or face to face meetings
- a series of interviews with interested parties
- direct engagement with community infrastructure operators in nearby towns, such as accommodation and fuel providers
- a dedicated project page on the APA website (Bulloo Interlink Pipeline project) which hosts up to date project information and APA contact details
- operation of a 1800 phone line and project email account
- project briefings with relevant government departments and representatives
- engagement with Native Title Holders including the Kullilli Bulloo River Aboriginal Corporation Registered Native Title Body Corporate (RNTBC) and Wangkumarra Kawalanyi Aboriginal Corporation RNTBC.

6.3 Future consultation activities

Future consultation activities would target a broad range of stakeholders and seek community involvement as part of the development of the EA. Activities would include:

- notification to stakeholders of the EPBC referral submission and information on how to make a submission when it is advertised for public comment
- community information sessions
- continued on-on-one engagement with directly affected landowners and other affected parties
- regular engagement with the Traditional Owners, Native Title Holders, as relevant to the assessment and management of cultural heritage
- regular engagement with State and Commonwealth government departments
- briefings with Bulloo and Quilpie Shire Councils
- sharing of information via letters, emails and the project website.

The project is located on the traditional Country of the Wangkumarra People and Kullilli People. Consultation with First Nations people and communities is being undertaken in accordance with the *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act* (DCCEEW, 2023). This approach recognises the importance of early, ongoing and culturally appropriate engagement with Traditional Owners whose Country may be affected by the project.

Consultation with First Nations stakeholders would continue throughout the assessment, approval and delivery phases of the project, with outcomes of engagement informing CHMAs, project design, environmental management measures and approval conditions, as relevant.

7. Impact assessment

7.1 Overview

The activities proposed during the construction, operation and decommissioning of the project (as detailed in sections 4.5, 4.8 and 4.9, respectively), have been summarised into the following overarching activities for the purposes of this impact assessment:

- **Construction:**
 - general construction activities – vehicle and/or machinery usage and maintenance, stockpiling, and storage and handling of hazardous materials
 - site establishment and preparation – clearing and grading, construction of a temporary accommodation facility, and construction/upgrade of access tracks
 - pipeline installation – stringing and bending, trenching/trenched crossings, trenchless crossings (e.g. HDD), lowering in and backfilling, and hydrostatic testing.
- **Operation:**
 - vehicle movement
 - routine maintenance, repairs and inspections
 - facility usage.
- **Decommissioning:**
 - decommissioning of the pipeline
 - removal of surface infrastructure.

The potential impacts for each of the activities listed above have been summarised according to the general aspects of these activities that may lead to adverse environmental impacts ('impact factors'). Table 7.1 below summarises the relationship between the proposed activities involved in the construction, operation and decommissioning of the project, and the identified impact factors.

Table 7.1 Summary of potential impacts

Activities	Impact factors												
	Vegetation clearing and habitat degradation	Vehicle collision	Soil disturbance	Contamination and pollution	Dust	Light	Noise	Vibration	Air quality and odour	Invasive species	Hydrological changes	Interaction with a heritage place or heritage values	Demand for resources and facilities
Construction													
General construction activities													
Vehicle and/or machinery usage and maintenance	•	•	•	•	•	•			•	•			•
Stockpiling			•	•	•						•		
Storage and handling of hazardous materials				•					•	•			
Site establishment and preparation													
Clearing and grading	•		•		•		•	•		•	•	•	
Construction of temporary accommodation facility							•	•					
Construction/upgrade of access tracks					•	•	•	•				•	
Pipeline installation													
Stringing and bending							•	•					
Trenching/trenched crossings	•		•	•	•	•	•	•				•	
Trenchless crossings (e.g. HDD)			•	•	•	•	•	•				•	
Lowering in and backfilling					•		•	•					
Hydrostatic testing				•		•	•	•					
Operation													
Vehicle movement		•	•	•	•				•	•			•
Routine maintenance, repairs and inspections			•	•	•	•	•	•					
Facility usage				•									•
Decommissioning													
Decommissioning of the pipeline	•		•	•	•		•	•	•				
Removal of surface infrastructure			•				•	•			•	•	

7.2 Air

This section summarises the assessment of potential impacts during construction, operation and decommissioning of the project in relation to:

- Air quality, supported by the Air Quality Impact Assessment provided in Appendix D
- Greenhouse gases, supported by the Greenhouse Gas Assessment provided in Appendix H.

7.2.1 Relevant project aspects

Air quality

The main source of potential air quality impacts associated with project would be generation of dust during construction. Key construction activities with the potential to generate dust emissions include:

- vehicle and/or machinery usage and maintenance
- stockpiling
- clearing and grading
- construction/upgrade of access tracks
- trenching/trenched crossings
- lowering in and backfilling.

Air emissions associated with the operation of the pipeline and associated surface infrastructure would be minimal, infrequent and localised to the source. No continuous emission sources are anticipated during normal operation of the project, and overall operational emissions are considered to be minor. Due to this frequency and type of processes performed as part of the project operation, the operational phase has not been assessed further in this assessment.

The emissions related to the decommissioning period of the project would be limited, temporary and localised. These activities would occur intermittently over the decommissioning period, with works at individual locations expected to last up to approximately one week and periods of inactivity between works. As such, decommissioning-related emissions would be comparable in nature to construction emissions but of shorter duration and limited extent.

Greenhouse gases

The following construction activities have been identified with the potential to impact on EVs associated with greenhouse gas emissions:

- vehicle and/or machinery usage and maintenance
- clearing and grading.

Operational activities would consist of maintenance and repair works and occasional vehicle movement from employees travelling to and from site in order to conduct operational inspections. These activities would take place periodically during the pipeline's operational lifespan and are generally limited in scope and confined to specific locations. Operational risks are mainly linked to routine maintenance work.

Decommissioning activities would consist of the decommissioning of the pipeline and removal of surface infrastructure. Flaring and venting emissions are anticipated to be generated during the decommissioning of the pipeline. Other potential sources of emissions during decommissioning would be associated with the consumption of diesel by vehicles and machinery required to remove surface infrastructure.

7.2.2 Environmental values

Local meteorology

A review of data collected by the BoM from surrounding active automatic weather stations (AWS) between 2020 and 2024 has been undertaken to characterise prevailing wind conditions. The AWS used in this assessment are listed in Table 7.2.

The wind roses indicate consistent wind patterns across the region, with winds predominantly originating from the south south-east. Between 2020 and 2024, wind speeds at the surrounding AWS were generally within the range of 3.0 m/s to 7.5 m/s. The highest wind speeds (greater than 7.5 m/s) were most frequently recorded at the Ballera Gas Field AWS, occurring during approximately 13.7% of observed hours. In contrast, calmer wind conditions (less than 0.5 m/s) were most common at the Fowlers Gap AWS, with an average of 5.9% of hours over the same period.

Table 7.2 Meteorological stations surrounding the project site

Name	Number	State	Approximate distance from project site (km)
Tibooburra Airport	46126	NSW	51
Ballera Gas Field	45009	Qld	101
Thargomindah Airport	45025	Qld	130
White Cliffs AWS	46129	NSW	222
Moomba Airport	17123	South Australia	232
Fowlers Gap AWS	46128	NSW	236

Ambient air quality

A review of data collected by the Queensland Government and the NSW Department of Planning Industry and Environment, from surrounding active ambient air quality monitoring stations (AQMS) between 2020 and 2024, has been undertaken to characterise background concentrations. Note that comparisons against air quality standards are for indicative purposes only.

The closest active AQMS to the project site is Tibooburra. This AQMS is part of the indicative Rural Air Quality Monitoring Network used to monitor dust and smoke in rural and remote areas of NSW (not NATA-accredited). Located at the Tibooburra airport, it was commissioned in 2004 and is situated approximately 50 km south-west of the CRoW.

Between 2020 and 2024, air quality at the Tibooburra AQMS was generally good, with annual PM₁₀ (i.e. particulate matter ≤10 micrometres (µm) in diameter), PM_{2.5} (i.e. particulate matter ≤2.5 µm in diameter) and total suspended particle (TSP) concentrations remaining well below the Environmental Protection (Air) Policy 2019 objectives. The maximum annual average PM₁₀ concentration was recorded in 2020 (8.5 µg/m³), with 14 exceedances of the 24-hour PM₁₀ criterion and four exceedances of the 24-hour PM_{2.5} criterion.

The primary non-industrial emission sources include wind-blown dust from exposed undeveloped lease hold land and dust associated with vehicular traffic on the local road network. A search of the National Pollutant Inventory indicates that there are no industrial activities occurring within a 2 km radius of the project site.

Sensitive receptors

Sensitive receptor locations around the project have been identified in accordance with the *Application requirements for activities with impacts to air* (DETSI, 2025f) and *Guidance on the assessment of dust from demolition and construction* (IAQM Guidance) (Institute of Air Quality Management (IAQM), 2024). These sensitive receptors are detailed in Table 7.3, including distance to the project site and to the nearest unsealed access roads/tracks likely to be used during construction of the project. Temporary accommodation facilities have been conservatively included in the assessment of potential air quality impacts, despite being project-related development.

Based on IAQM guidance, most of these receptors are characterised as human receptors. The two temporary accommodation facilities have been characterised as both human receptors and ecological receptors based on their location in undeveloped semi-arid rangeland.

Table 7.3 *Sensitive receptors (air)*

ID	Description	IAQM receptor type	Distance to CRoW (m)	Distance to unsealed access roads/tracks used for construction (m)
R1	Residential (unoccupied)	Human receptor	254	171
R2	Residential	Human receptor	1,998	1,993
R3	Passive recreation	Human receptor	2,268	38
R4	Residential	Human receptor	2,345	53
R5	Residential	Human receptor	2,846	1,551
R6	Passive recreation	Human receptor	2,950	382
R7	Residential	Human receptor	3,007	1,488
R8	Shed	Human receptor	3,077	62
R9	Active recreation	Human receptor	3,100	58
R10	Community centre	Human receptor	3,124	33
R11	Commercial	Human receptor	3,145	16
R12	Residential	Human receptor	3,170	13
R13	Temporary accommodation	Human receptor	3,213	41
R14	Passive recreation	Human receptor	3,281	1,840
R15	Commercial	Human receptor	4,496	1,073
R16	Commercial	Human receptor	4,601	1,117
R18	Nockatunga temporary accommodation facility and stockpile	Human receptor	Project-related	<1
R19	Tickalara temporary accommodation facility	Human receptor	Project-related	<1

7.2.3 Potential project impacts

Air quality

Table 7.4 summarises the potential air quality impacts during the construction, operation and decommissioning of the project.

Table 7.4 Potential impacts – air quality

Activity	Impact factors	Impact description
Construction		
Vehicle and/or machinery usage and maintenance	Dust	Generation of dust due to the movement of vehicles and/or machinery on unpaved access tracks.
	Air quality and odour	Combustion emissions and air toxics generated by diesel-powered plant, generators, heavy and light vehicles and mobile construction machinery.
Stockpiling	Dust	Dust generation due to wind erosion on exposed stockpiles.
Clearing and grading	Dust	Generation of dust due to vegetation clearing, topsoil stripping, grading and levelling.
Construction/upgrade of access tracks	Dust	Generation of dust during the construction of unpaved access tracks.
Trenching/trenched crossings	Dust	Generation of dust due to the mechanical extraction of soil during trenching.
Lowering in and backfilling	Dust	Generation of dust due to backfilling of extracted soil.
Operation		
Vehicle movement	Dust	Generation of dust due to vehicle use by field personnel around the project site on paved and un-paved road surfaces.
Decommissioning		
Decommissioning of the pipeline	Dust; air quality and odour	Impacts to air quality as a result of residual gas and dust generated by short-term surface disturbance and the use of construction type equipment and vehicles.

Greenhouse gases

The greenhouse gasses relevant in the context of the project include carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The greenhouse gas profile of the project is characterised by a one-off construction phase followed by a long-term, low-emissions operational phase.

While construction activities, calculated using a conservative model, generate approximately 151,580 t CO₂e in Year 1 (approximately 0.12% of Queensland's total greenhouse gas emissions), this represents a non-recurring capital emission associated with establishment of the infrastructure. Operational emissions reduce significantly thereafter to approximately 2,745 t CO₂e per annum (approximately 0.002% of Queensland emissions).

Over the project's 40-year operational life, total emissions are estimated at approximately 268,000 t CO₂e, equating to an average annual emissions profile of ~6,535 t CO₂e/year.

Importantly, the construction disturbance footprint will be rehabilitated progressively, allowing for natural regeneration of vegetation and soil carbon, which will partially offset the initial construction emissions over time.

Accordingly, it is considered appropriate to assess the project's emissions profile on a lifecycle and net emissions basis, rather than a single-year construction peak, as this provides a more accurate representation of the project's long-term environmental performance.

This approach is consistent with lifecycle greenhouse gas assessment practices commonly applied to linear infrastructure projects, where emissions are dominated by establishment activities and followed by low ongoing operational emissions.

Table 7.5 summarises the potential greenhouse gas impacts during the construction, operation and decommissioning of the project.

Table 7.5 *Potential impacts – greenhouse gas emissions*

Activity	Impact factors	Impact description
Construction		
Vehicle and/or machinery usage and maintenance	Contamination and pollution	Greenhouse gas emissions generated by fuel consumption from construction equipment, transportation of pipes from stockpiles to pipe corridor and employees travelling to and from site (from camp to pipeline corridor).
Clearing and grading	Vegetation clearing	Greenhouse gas emissions generated by vegetation clearing and a loss of carbon sink.
Operation		
Vehicle movement	Demand for resources and facilities	Greenhouse gas by generated from diesel used during employee travel to and from site to undertake routine and emergency maintenance.
Facility usage	Demand for resources and facilities	Fugitive emissions associated with transmission of natural gas in a pipeline, associated with equipment leaks, evaporation losses, and other non-combustion sources
Decommissioning		
Decommissioning of the pipeline	Contamination and pollution	Greenhouse gas emissions generated by venting and flaring of natural gas, and diesel consumption from mobile plant and/or vehicles and stationary diesel powered equipment.

7.2.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of air related impacts during construction, operation and decommissioning of the project are outlined in Table 7.6.

Table 7.6 *Mitigation and management measures – air*

Impact/issue	Mitigation measure	Timing
Air quality		
Construction air quality	Air quality management measures would be included in the CEMP and implemented during construction. The CEMP would detail processes, responsibilities and measures to manage air quality and minimise the potential for impacts during construction. The CEMP would include, but not be limited to: – a map identifying locations of sensitive receptors – potential sources of emissions to air – air quality management objectives consistent with the Environmental Protection (Air) Policy 2019 – management measures to be implemented, including preferred methods for dust suppression and triggers for implementation – a process for monitoring dust on site and weather conditions.	Pre-construction, construction
Vehicle movements	Measures to minimise dust emissions associated with vehicle movements on unsealed roads during construction of the project would be included in the CEMP and implemented where dust from project-related traffic movements has the potential to impact sensitive receptors (including those within 250 m of unsealed access tracks and roads).	Construction
Decommissioning air quality	Measures to minimise dust emissions associated with vehicle movements on unsealed roads during operation of the project would be consistent with those applied during construction.	Decommissioning

Impact/issue	Mitigation measure	Timing
Greenhouse gases		
Energy use and greenhouse gases	Opportunities to reduce greenhouse gas emissions would be investigated and implemented as far as practicable including, but not limited to: – planning methods for efficient transportation of materials and workers to and from the site – efficiently scheduling and planning material handling to minimise fuel consumption – formal leak detection and cathodic protection surveys conducted annually in accordance with <i>AS 2885.3:2022 Pipelines – Gas and liquid petroleum, Part 3: Operation and maintenance</i> – investigating the potential for solar energy to supply a portion of electricity demand at the temporary accommodation facilities – sourcing services and materials (aggregates, etc.) locally, where practicable – maintaining plant and equipment in good condition to minimise fuel consumption and emissions – switching off plant, equipment and vehicle engines when not in use – use of B10, renewable or biodiesel fuels for trucks and vehicles where practicable.	Construction, operation, decommissioning

7.2.5 Risk assessment

Air quality

The risks of the potential impacts have been evaluated without (initial risk) and with (residual risk) the application of mitigation and management measures, as summarised in Table 7.7. The full risk assessment is provided in Appendix I.

The risk of air quality impacts on sensitive receptors would be low during construction of the project, based mainly on the significant separation distances between the project site and access roads and those receptors. The application of standard construction dust management measures (refer to section 7.2.4) would further support a low risk of air quality impacts.

The risk of air quality impacts during operation and decommissioning would be low given the relatively low intensity of activities during those project phases, and limited emissions sources. The application of the management measures outlined in section 7.2.4 would reduce these risks to negligible.

Table 7.7 Potential risks – air quality

Project phase	Risk	Initial risk	Residual risk
Air quality			
Construction	Vehicle and/or machinery usage and maintenance	Low	Low
Construction	Vehicle and/or machinery usage and maintenance	Low	Low
Construction	Stockpiling	Low	Low
Construction	Clearing and grading	Low	Low
Construction	Construction/ upgrade of access tracks	Low	Low
Construction	Trenching/trenched crossings	Low	Low
Construction	Trenching/trenched crossings	Low	Low
Construction	Lowering and backfilling	Low	Low
Operation	Vehicle movement	Low	Negligible
Decommissioning	Decommissioning of the pipeline	Low	Negligible

Greenhouse gases

The risks of the potential impacts have been evaluated without (initial risk) and with (residual risk) the application of mitigation and management measures, as summarised in Table 7.8. The full risk assessment is provided in Appendix I.

The unavoidable need to use fossil fuels for plant and equipment contributes to greenhouse gas emissions. With the application of fuel efficiency measures, alternative non-emissive or lower emissions power sources, efficient programming and selection of construction materials, and maintenance of plant and equipment, these emissions can be reduced to low levels in most cases.

However, the majority of the project's estimated greenhouse gas emissions during construction are driven by a conservatively assessed temporary loss of carbon sink from vegetation clearing.

To estimate emissions associated with vegetation clearing and the temporary loss of carbon sink during construction, FullCAM information derived from the Transport Authorities Greenhouse Group (TAGG) report (TAGG, 2013), relevant to the project locality, was applied. The TAGG methodology was selected as a conservative and regulator-recognised proxy for estimating land-sector emissions associated with linear infrastructure construction, noting that no pipeline-specific land-sector greenhouse gas methodology is currently available. Land-sector emissions estimated using this methodology represent a conservative estimate of construction-phase impacts and do not reflect ongoing or sustained operational emissions. Also, there is no allowance for post-construction rehabilitation, regrowth, or recovery of vegetation and carbon stocks.

The majority of emissions associated with the operation of the pipeline are from fugitive emissions. This has been calculated using the default calculation and factor in the NGER Measurement determination, which is a benchmark of natural gas transmission. Other project operational emissions are relatively small – there is fuel consumption for field staff to inspect and maintain the pipeline, and electricity consumption for end of line operational equipment. These are both typical emissions sources for operation of a gas transmission pipeline.

Moderate risks would remain for clearing and grading during construction, and facility usage during operation, given the more limited opportunities to minimise emissions during these activities.

Table 7.8 *Potential risks – greenhouse gas emissions*

Project phase	Risk	Initial risk	Residual risk
Greenhouse gases			
Construction	Vehicle and/or machinery usage and maintenance	High	Low
Construction	Clearing and grading	High	Moderate
Operation	Vehicle movement	Moderate	Low
Operation	Facility usage	Moderate	Moderate
Decommissioning	Decommissioning of the pipeline	Moderate	Low

7.3 Land

This section summarises the assessment of potential impacts during construction, operation and decommissioning of the project in relation to:

- Soils and geology
- Land use and tenure
- Terrestrial ecology, supported by the Terrestrial Ecology Assessment provided in Appendix B.

7.3.1 Relevant project aspects

Soils and geology

The following construction activities have the potential to impact on EVs associated with soils and geology:

- stockpiling
- storage and handling of hazardous materials
- clearing and grading.

Operational activities would be limited to routine inspection, monitoring and maintenance of the pipeline and associated above ground infrastructure, with occasional vegetation management, erosion repair and easement maintenance. These activities would occur intermittently over the operational life of the pipeline and would generally involve light vehicle and small machinery access along existing tracks or within the permanent easement, resulting in small scale and localised soil disturbance. Limited short-term excavation may be required for maintenance or repair works; however, such activities are expected to be infrequent, small in scale and confined to areas immediately surrounding the pipeline.

Most of the pipeline is expected to remain in place during decommissioning which would minimise soil disturbance. Soil disturbance from the removal of surface infrastructure and sections where cutting, capping and filling is required, is expected to be localised.

Land use and tenure

The following construction activities have the potential to impact on EVs associated with land use and tenure:

- clearing and grading
- construction/upgrade of access tracks
- trenching/trenched crossings.

Operational activities would be limited to routine inspection, monitoring and maintenance of the pipeline and associated above ground infrastructure and would generally involve light vehicle and small machinery access along existing tracks or within the permanent easement. Limited short-term excavation may be required for maintenance or repair works; however, such activities are expected to be infrequent, small in scale and confined to areas immediately surrounding the pipeline. The establishment of an easement along the pipeline alignment would limit the types of activities that can be carried out, particularly ground disturbing works, excavations and other ground-intrusive works.

Most of the pipeline is expected to remain in place during the decommissioning phase, minimising land use disturbance. Land use disturbance from the removal of surface infrastructure and pipeline sections where cutting, capping and filling is required, is expected to be localised and short-term.

Terrestrial ecology

The following construction activities have the potential to impact on EVs associated with terrestrial ecology:

- vehicle and/or machinery usage and maintenance
- storage and handling of hazardous materials
- clearing and grading
- construction/upgrade of access tracks

- trenching/trenched crossings
- trenchless crossings (e.g. HDD).

Operational activities would consist of inspection, maintenance and repair tasks, and include the movement of vehicles throughout the site to undertake these routine actions. These actions would be carried out intermittently over the operational life of the pipeline, and would be confined to small, defined areas. Under section 49 of the Nature Conservation (Plants) Regulation 2020, a general exemption applies for the clearing of vegetation associated with routine maintenance of existing infrastructure (e.g. buildings, roads, stockyards, fences and vehicular tracks).

Most of the pipeline is expected to remain in place during decommissioning minimising disturbance of vegetation and habitat disturbance. Disturbance associated with the removal of surface infrastructure and sections where cutting, capping and filling is required, would be localised. Consequently, potential impacts on terrestrial ecological values such as localised habitat degradation and injury or mortality of fauna are expected to be localised and short-term in nature.

7.3.2 Environmental values

Soils and geology

The topography across the project site is relatively flat with small rises and dips along its length, and has a general elevation between 85 m and 160 m AHD. Topography consists of alluvial plains with gentle falls and rises, with changes in elevation mainly associated with creek crossings, and no areas of steep or rugged topography along the route. No impacts in relation to topography were identified.

The surface geology of the project site is dominated by alluvium rock, with intrusions of arenite-mud rock and arenite-rudite, as summarised in Table 7.9 below.

Table 7.9 Surface geology within the pipeline alignment

Unit names	Unit age	Lithology	Dominant rock
Winton Formation	Late Cretaceous	Labile sandstone, siltstone, mudstone, minor coal	Arenite-mudrock
Qa-QLD	Quaternary	Clay, silt, sand and gravel; flood-plain alluvium	Alluvium
Qr1f-QLD	Quaternary	Sandy red soil, minor gravel; residual soil, colluvium	Colluvium
Glendower Formation (Tg)	Paleocene–Eocene	Fluviatile pebbly clayey quartzose sandstone, sandy siltstone, minor conglomerate and mudstone; lateritised and silicified	Arenite-rudite
Q-SWQ	Quaternary	Undifferentiated soil, sand, silt and gravel; possibly mainly high-level (Pleistocene?) alluvium	Miscellaneous unconsolidated sediments

The primary soil order intersected by the project site are vertosols, which are characterised by high clay content and pronounced shrink–swell behaviour, with extensive cracking during dry periods and reduced permeability under wet conditions. As a result, vertosols are typically associated with higher surface runoff potential and can influence both natural drainage patterns and soil stability during construction if not appropriately managed. Kandosols are also present along the pipeline alignment and generally exhibit relatively uniform soil profiles with moderate permeability and drainage capacity. These characteristics are typically associated with moderate runoff responses and comparatively consistent infiltration behaviour relative to vertosols.

A review of the Atlas of Australian soils mapping (Queensland Government, 2025), shows the eight unique soil classifications within the project site. Mapped soils and their descriptions are presented in Table 7.10.

It is unlikely that ASS would be present within the project site, as it is located well above 20 m AHD and is not located near the coastline.

Table 7.10 *Atlas of Australian soils mapping classifications within the pipeline alignment*

Real property description	Mapping code	Dominant soil principal profile form (PPF)	Classification	Description
Lot 3 on WLA14	BE14	Um5.3	Brown and red earthy loams	Uneven undulating terrain with many small ridges, pediments, dissection slopes and flats.
Lot 424 on SP307646	MM65	Ug5.34	Brown and red self-mulching cracking clays	Uniform fine cracking, smooth faced peds, brown clay horizon redder than 1.5 m deep.
Lot 2 on SP184928	Fz49	Um1.43	Firm shallow siliceous loams	Dissected low plateau with scarps mesas and buttes some gently undulating plateau crests.
Lot 3 on BI22	CC97	Ug5.24	Grey self-mulching cracking clay	Uniform fine cracking, smooth faced peds, grey clay horizon underlain by grey/mottled clay.
Lot 1322 on PH1737	MM70	Ug5.34	Brown and red self-mulching cracking clays	Uniform fine cracking, smooth faced peds, brown clay horizon redder than 1.5 m deep.
Lot 1673 on SP289790	MM66	Ug5.38	Brown and red self-mulching cracking clays	Uniform fine cracking, smooth faced peds, red clay horizon redder than 1.5 m deep.
Lot 468 on PH1653	Nd7	Dr1.32	Crusty red duplex soils	Dissected plateau frequently of cuesta form and with steep scarp slopes.
	MM69	Ug5.3	Brown cracking clays	Valley plains often with many distributary channels.

Land use and tenure

Located on the southern end of the Channel Country bioregion in Qld, land uses within and surrounding the project site predominantly consists of grazing native vegetation (utilised for extensive cattle and sheep grazing), the Bulloo Downs Nature Refuge (managed as resource protection) and lakes including the Bulloo River.

The Channel Country strategic environmental area (CC-SEA) intersects with the project site, situated along the Wilson River and extending upstream and downstream of the project site to the border of South Australia. The project site does not encroach upon any priority agricultural areas, strategic cropping areas, or priority living areas. There are also no protected areas present within the project site. The Bulloo Downs Nature Refuge is located south-east of the project site, approximately 0.8 km away at the closest point, along the Qld–NSW border.

Land uses with potential sensitivity (including residences or homesteads) to pipeline construction or operation are generally offset from the pipeline alignment by several kilometres. No major land use features have been identified within the immediate pipeline corridor, and the spatial separation indicates a low likelihood of direct land use conflict associated with the pipeline alignment.

Most of the project site is located on leasehold land, with the pipeline alignment selected to minimise impacts on landholders, community and natural environment while also allowing the existing landholders to continue their farming activities.

The pipeline alignment crosses government and privately held land parcels. The project is proposed to be located over seven land parcels, as described in Table 7.11.

Table 7.11 Land parcels located within the pipeline alignment

Real property description	Property name	Tenure	Local government area
Lot 3 on WLA14	Buckaroola	Lands lease	Bulloo Shire Council
Lot 424 on SP307646	Elm	Lands lease	Bulloo Shire Council
Lot 2 on SP184928	Kihee	Lands lease	Bulloo Shire Council
Lot 3 on BI22	Nockatunga	Lands lease	Bulloo Shire Council
Lot 1322 on PH1737	Wonpa	Lands lease	Bulloo Shire Council
Lot 1673 on SP289790	Bulloo Downs	Lands lease	Bulloo Shire Council
Lot 468 on PH1653	Tickalara	Lands lease	Bulloo Shire Council

The project site is subject to two native title determinations. A determination was made on 2 July 2014 that found native title exists in the entire determination area for the Kullilli People (QCD2014/013). A determination was made on 7 July 2024 that found native title exists in the entire determination area for the Wangkumarra People (QCD2024/003).

A search of the DWATSIPM Cultural Heritage Database and Register was conducted (on 28 April 2026) to identify the Aboriginal parties (Traditional Custodians) for the project site. The search identified the Kullilli and Wangkumarra People as the Traditional Custodians for the project site, represented by the Kullilli Bulloo River Native Title Aboriginal RNTBC and Wangkumarra Kawalanyi Aboriginal Corporation RNTBC.

Terrestrial ecology

Vegetation and ecological communities

In Queensland, vegetation communities are classified based on the RE framework which defines communities within a bioregion that are consistently associated with a particular combination of geology, landform, and soil. The Regional Ecosystem Description Database defines each REs biodiversity status (BD status) and its vegetation management class (VM class).

REs associated with MSES under Schedule 2 of the EO Regulation are based on the VM class.

Field verified REs found within the project site are described in Table 7.12.

Table 7.12 Field-verified REs within the project site

Regional ecosystem	VM Act class	Regulated vegetation	Extent within project site	Description
5.3.2 – <i>Eucalyptus camaldulensis</i> +/- <i>E. coolabah</i> open woodland on levees and banks of drainage lines.	Least concern	Category B	18 ha	The community was observed occurring on sandy-rocky alluvial substrates, minor terraces and floodplain tributaries of the Wilson and Bulloo rivers.
5.3.4 – <i>Eucalyptus camaldulensis</i> +/- <i>Acacia aneura</i> +/- <i>A. cambagei</i> +/- <i>A. georginae</i> +/- <i>A. cyperophylla</i> var. <i>cyperophylla</i> woodland on drainage lines within ranges.	Least concern	Category B	4.6 ha	The community was observed occurring on rocky alluvial substrates with minor sandy deposits in the upper catchments of the Bulloo and Wilson rivers.
5.3.5 – <i>Eucalyptus coolabah</i> open woodland +/- <i>Duma florulenta</i> shrubland on braided channel systems.	Least concern	Category B	16.4 ha	The community was observed occurring on loamy alluvial substrates on braided alluvial plains of the Wilson River and tributaries of the Bulloo River.
5.3.9 – <i>Acacia cambagei</i> +/- <i>Eucalyptus coolabah</i> low woodland on braided channel systems.	Least concern	Category B	38.6 ha	The community was observed occurring on sandy to rocky alluvial substrates on braided channels and terraces of the Wilson and Bulloo rivers.

Regional ecosystem	VM Act class	Regulated vegetation	Extent within project site	Description
5.3.21 – Variable sparse to open herbland, <i>Senna</i> spp. open shrubland and bare scalded areas on infrequently flooded alluvia of major rivers their distributaries, drainage channels and creeks.	Least concern	Category B	189.5 ha	The community was observed occurring on floodplains and claypans fringing tributaries of the Wilson and Bulloo rivers. Structure was variable in response to grazing pressure; however, is consistently comprised of native species. The area also presented as seasonally scaled clay pans and minor gibber plains.
5.5.1 – <i>Acacia aneura</i> low woodland on Quaternary deposits.	Least concern	Category B	98 ha	The community was observed occurring on red-orange weathered loamy soils with sections of gibber plain. Localised sections of drought induced dieback predominantly affecting <i>Acacia</i> species is present.
5.5.1x2 – <i>Acacia cambagei</i> low open woodland on Quaternary sediments.	Least concern	Category B	106.3 ha	The community was observed occurring on weathered loamy clay plains and broadly undulating downs with minor drainage features. Soils are red-orange clay loams with iron stone often forming areas of bare gibber. Localised sections of drought induced dieback predominantly affecting <i>Acacia</i> species.
5.5.4x1 – <i>Aristida contorta</i> open tussock grassland with occasional scattered/groved <i>Acacia sibirica</i> , <i>A. aneura</i> and in places, isolated low trees of <i>Corymbia terminalis</i> occur.	Least concern	Category B	349.9 ha	The community occurs on gently undulating downs and minor drainage features. Soils are red-orange clay-loams with stones and boulders spread throughout, often forming gilgai on hillcrests.
5.6.2 – <i>Acacia cambagei</i> low open woodland on interdune areas and clay plains at interface with dune fields.	Least concern	Category B	25.3 ha	The community occurs on deep residual sand dunes. Soils are an orange-red sandy-clay and includes ephemeral wetlands in the interdunal clay pans.
5.6.4 – <i>Atalaya hemiglauca</i> +/- <i>Acacia aneura</i> +/- <i>Acacia</i> spp. +/- <i>Corymbia terminalis</i> low open woodland on reticulate sand dunes.	Least concern	Category B	12.8 ha	The community occurs on low shallow residual sand dunes which overlie the adjacent clay alluvia. Soils are an orange-red sandy-clay often with small fragments of silcrete.
5.9.3 – <i>Astrebla</i> spp. +/- short grasses +/- forbs open tussock grassland to herbland.	Least concern	Category B	239.7 ha	The community occurs on gently undulating downs and minor drainage features. Soils are an orange-grey clay-loam, often forming gilgai on hillcrests with sections of iron stone forming gibber.

Flora

As summarised in Table 7.13, only two flora species listed under the NC Act were considered to have the potential to occur with the project site.

Table 7.13 *Flora – likelihood of occurrence summary*

Scientific name	Common name	NC Act status	Likelihood of occurrence
<i>Rhodanthe rufescens</i>	-	NT	Potential to occur The nearest record of this species is around 5 km from the project site
<i>Sclerolaena walkeri</i>	–	LC	Potential to occur The nearest record of this species is more than 70 km from the project site

Note: Under the NC Act, NT = near threatened; LC = least concern

The project intersects an area shown as a high-risk area on the protected plants flora survey trigger map between Warri Gate Road and the alignment at KP 83 on an existing vehicle access track as shown on Figure 7.1.

The area corresponds to a 1987 record of *Rhodanthe rufescens* occurring at the Noccundra air strip. Field surveys have not detected this species within the project site *Rhodanthe rufescens* is listed as near threatened under the NC Act and is not MSES. Consequently, no further assessment has been undertaken.

Fauna

Fauna habitat types within the project site comprise the following as described in Table 7.14:

- Riparian woodlands on ephemeral creek beds and floodplains
- Gidgee and mulga woodlands on alluvial plains
- Shrubland on sandy plains
- Forb/herb/grasslands and gibber plains
- Seasonal wetlands and floodplains.

Table 7.14 Terrestrial fauna habitat types within the project site

Fauna habitat type	Description of habitat type
Riparian woodlands on ephemeral creek beds and floodplains	
	These areas were represented across the project site, with greater prominence on braided channels towards the northern-central portion of the pipeline alignment. Total area: 55.2 ha Associated REs: 5.3.2, 5.3.4, 5.3.5 and 5.3.7. Description: Occurs along ephemeral creek lines, levees and braided drainage channels, often dominated by <i>Eucalyptus camaldulensis</i>, <i>E. coolabah</i> and associated <i>Acacia</i> spp. Dense mid-storey patches and chenopod shrubs occur where grazing pressure is low. Large hollow-bearing eucalypts, coarse woody debris and moisture-retentive alluvial soils provide important shelter and nesting habitat. Fauna values: – Movement corridors for woodland birds (honeyeaters, woodswallows, parrots) and arboreal reptiles. – Foraging habitat for raptors including red goshawk, brown falcon and black falcon. – Seasonal amphibian breeding habitat in inundated areas. Target species: Painted honeyeater (<i>Grantiella picta</i>), Pink cockatoo (<i>Lophochroa leadbeateri leadbeateri</i>), Southern whiteface (<i>Aphelocephala leucopsis</i>), Fork-tailed swift (<i>Apus pacificus</i>), Short-beaked echidna (<i>Tachyglossus aculeatus</i>), Blue-winged parrot (<i>Neophema chrysostoma</i>), migratory shore/wetland birds, Red goshawk (<i>Erythrotriorchis radiatus</i>) and Grey falcon (<i>Falco hypoleucos</i>).
Gidgee and mulga woodlands on alluvial plains	
	Large patches of this habitat were distributed across the project site. Total area: 268.2 ha Associated REs: 5.3.9, 5.5.1, 5.5.1x2 and 5.6.2. Description: Low to open woodland dominated by <i>Acacia</i> spp. (e.g. <i>A. cambagei</i>). Occasional <i>Eucalyptus coolabah</i> on braided channels. Occurring largely on cracking clay plains and minor drainage lines. Understorey varied from chenopod shrubland to sparse tussock grasses. Mistletoe (<i>Amyema preissii</i>) common in some patches, supporting specialised nectar- and fruit-eating birds. Fauna values: – Foraging and shelter for woodland birds including rufous whistler, hooded robin and honeyeater species. – Fallen timber may support reptiles and small mammals. – Seasonal productivity pulses after rain provide food for nomadic granivores. Target species: Southern whiteface (<i>Aphelocephala leucopsis</i>), Painted honeyeater (<i>Grantiella picta</i>), Blue-winged parrot (<i>Neophema chrysostoma</i>), Fork-tailed swift (<i>Apus pacificus</i>), Plains rat (<i>Pseudomys australis</i>), migratory wetland birds, Red goshawk (<i>Erythrotriorchis radiatus</i>), Grey falcon (<i>Falco hypoleucos</i>), Short-beaked echidna (<i>Tachyglossus aculeatus</i>) and Pink cockatoo (<i>Lophochroa leadbeateri leadbeateri</i>).

Fauna habitat type	Description of habitat type
Variable shrubland on sandy plains	
	Patches of this fauna habitat were distributed across the project site. Total area: 12.8 ha Associated REs: 5.6.4 and 5.9.1. Description: Shrublands dominated by whitewood, mulga and bloodwood and mixed flowering lignum (<i>Eremophila polyclada</i>) on deep red sands. Ground layer observed to have ephemeral herbs. High structural heterogeneity with patches of dense shrubs and open sandy interspaces. Fauna values: – Burrowing habitat for reptiles and small mammals. – Nectar and fruit from shrub layer supports honeyeaters. – Foraging habitat for raptors. Target species: Plains-wanderer (<i>Pedionomus torquatus</i>), Painted honeyeater (<i>Grantiella picta</i>), Blue-winged parrot (<i>Neophema chrysostoma</i>), Plains rat (<i>Pseudomys australis</i>), migratory wetland birds, Red goshawk (<i>Erythrorhynchus radiatus</i>), Grey falcon (<i>Falco hypoleucos</i>), Pink cockatoo (<i>Lophochroa leadbeateri leadbeateri</i>) and Short-beaked echidna (<i>Tachyglossus aculeatus</i>).
Variable forb/herb/grasslands and gibber plains	
	This habitat type dominated the majority of the project site. Total area: 763.2 ha Associated REs: 5.3.21, 5.5.4x1 and 5.9.3. Description: Open tussock grasslands (<i>Astrebla</i>, <i>Aristida</i>, <i>Sporobolus</i> spp.) and bare stony gibber surfaces interspersed with gilgai microrelief and occasional low shrubs (<i>Acacia tetragonophylla</i>, <i>Senna artemisioides</i>). Claypans and saline depressions are seasonally inundated, supporting ephemeral herbs and aquatic invertebrates. This habitat type also includes areas mapped as category X (non-remnant) vegetation, comprising derived grassland and heavily modified vegetation associated with pastoral land use. These areas provide low-structure but potentially useful foraging habitat for some generalist fauna species. Fauna values: – Plains with low grass cover and patchy herbs suitable for ground-dwelling birds. – Open foraging habitat for bustards, pratincoles and seed-eating birds. – Waterbird congregation sites during wet periods. Target species: Plains-wanderer (<i>Pedionomus torquatus</i>), Blue-winged parrot (<i>Neophema chrysostoma</i>), Plains rat (<i>Pseudomys australis</i>), Grey falcon (<i>Falco hypoleucos</i>), Fork-tailed swift (<i>Apus pacificus</i>) and migratory shorebirds.

Fauna habitat type	Description of habitat type
Seasonal wetlands and floodplains	
 	As a seasonal variation, this habitat was difficult to delineate from the winter survey, but is presumed to be present across the study area. This habitat type sits as proportions of the listed REs below and has seasonal variation, and variations between years, dependent upon rainfall, making it difficult to define and calculate area. Associated REs: 5.3.2, 5.3.4, 5.3.5 and 5.3.21. Description: Seasonally inundated channels, floodplains and depressions holding water after significant rainfall events. Substrate varies from sandy to heavy clays with fringing vegetation. Fauna values: – Breeding and foraging habitat for waterbirds (teals, herons, stilts) and migratory shorebirds. – Seasonal small mammal/amphibian boom-bust cycles. – High productivity pulses attracting raptors and scavengers. Target species: Southern whiteface (<i>Aphelocephala leucopsis</i>), Blue-winged parrot (<i>Neophema chrysostoma</i>), migratory wetland birds, Plains rat (<i>Pseudomys australis</i>), Painted honeyeater (<i>Grantiella picta</i>), Grey falcon (<i>Falco hypoleucos</i>), Red goshawk (<i>Erythrotriorchis radiatus</i>), Pink cockatoo (<i>Lophochroa leadbeateri leadbeateri</i>) and Short-beaked echidna (<i>Tachyglossus aculeatus</i>).

As summarised in Table 7.15, 16 conservation significant fauna species listed under the NC Act were confirmed present or are considered as being likely to occur or having the potential to occur within the project site. All but one conservation significant species (echidna) is also listed under the EPBC Act as MNES.

Table 7.15 Potential presence of protected fauna species within the project site

Scientific name	Common name	NC Act status	Likelihood of occurrence
Birds			
<i>Aphelocephala leucopsis</i>	Southern whiteface	V	Confirmed present
<i>Apus pacificus</i>	Fork-tailed swift	SL	Potential to occur
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	V	Likely to occur
<i>Calidris ferruginea</i>	Curlew sandpiper	CE	Likely to occur
<i>Erythrotriorchis radiatus</i>	Red goshawk	E	Potential to occur
<i>Falco hypoleucos</i>	Grey falcon	V	Likely to occur
<i>Gallinago hardwickii</i>	Latham's snipe	V	Likely to occur
<i>Grantiella picta</i>	Painted honeyeater	V	Likely to occur
<i>Hydroprogne caspia</i>	Caspian tern	SL	Likely to occur
<i>Lophochroa leadbeateri leadbeateri</i>	Pink cockatoo (eastern)	E	Likely to occur
<i>Neophema chrysostoma</i>	Blue-winged parrot	V	Confirmed present
<i>Pedionomus torquatus</i>	Plains-wanderer	CR	Confirmed present
<i>Plegadis falcinellus</i>	Glossy ibis	SL	Likely to occur
<i>Tringa nebularia</i> *	Common greenshank	E	Likely to occur
Mammals			
<i>Pseudomys australis</i>	Plains rat	V	Potential to occur
<i>Tachyglossus aculeatus</i>	Short-beaked echidna	SL	Likely to occur

Notes: CE = critically endangered, E = endangered, V = vulnerable, SL = special least concern.

Environmentally sensitive areas

In addition to the criteria used to determine the class under the VM Act, the BD status determines the condition of remnant vegetation. Importantly, the BD status is used to determine ESAs that regulate petroleum activities through provisions in the EP Act as follows:

- Category B ESAs comprise endangered REs
- Category C ESAs comprise of concern REs.

As presented in Table 7.16, ESAs present within the project site include Category C ESAs:

- of concern REs 5.5.1 and 5.5.1x2.

No Category A or Category B ESAs are present within the project site.

Table 7.16 ESAs and their relevance to the project

ESA	Relevance to project
Category A	
Any of the following areas under the NC Act:	
– National park (scientific)	Not present within the project site
– National park	Not present within the project site. The closest mapped national park in Queensland is Lake Bindegolly National Park approximately 165 km south-east of the project area.
– National park (Aboriginal land)	Not present within the project site.
– National park (Torres Strait Islander land)	Not present within the project site.
– National park (Cape York Peninsula Aboriginal land)	Not present within the project site.
– Conservation park	Not present within the project site.
– Special wildlife reserve	Not present within the project site.
The wet tropics area under the <i>Wet Tropics World Heritage Protection and Management Act 1993</i> (Qld)	Not present within the project site.
The Great Barrier Reef Region under the <i>Great Barrier Reef Marine Park Act 1975</i> (Cth)	Not present within the project site.
A marine park under the <i>Marine Parks Act 2004</i> (Qld), other than a part of the park that is a general use zone under that Act	Not present within the project site.
Category B	
Any of the following areas under the NC Act:	
– A coordinated conservation area	Not present within the project site.
– An area of critical habitat or major interest identified under a conservation plan	Not present within the project site.
– An area subject to an interim conservation order	Not present within the project site.
An area subject to the following conventions to which Australia is a signatory:	
– The 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979)	Not present within the project site.
– The 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat' (Ramsar, Iran, 2 February 1971)	
– The 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972)	
A zone of a marine park under the <i>Marine Parks Act 2004</i> (Qld) that is within a general use zone of the marine park under that Act	Not present within the project site.

ESA	Relevance to project
An area to the seaward side of the highest astronomical tide	Not present within the project site
The following under the <i>Heritage Act 1992</i> (Qld):	
– A place of cultural heritage significance	Not present within the project site.
– A Queensland heritage place, unless there is an exemption certificate issued under that Act	Not present within the project site
An area recorded in the Aboriginal Cultural Heritage Register established under the <i>Aboriginal Cultural Heritage Act 2003</i> (Qld), section 46, other than the area known as the 'Stanbroke Pastoral Development Holding', leased under the Land Act 1994 by lease number PH 13/5398	Not present within the project site.
A feature protection area, State forest park or scientific area under the <i>Forestry Act 1959</i> (Qld)	Not present within the project site.
A declared fish habitat area under the <i>Fisheries Act 1994</i> (Qld)	Not present within the project site.
A place in which a marine plant under the <i>Fisheries Act 1994</i> (Qld) is situated	Not present within the project site.
An endangered RE identified in the database known as the 'Regional ecosystem description database' published on the department's website.	Not present within the project site. REs are described in section 7.3.2.
Category C	
Nature refuges as defined in the conservation agreement for that refuge under the NC Act	Not present within the project site. Bulloo Downs Nature Refuge occurs south of an east-west section of the pipeline alignment between KP 187 (1 km south) and KP 174 (2 km), before moving northward.
Koala Habitat Areas as defined under the Nature Conservation (Koala) Conservation Plan 2006	Not present within the project site.
State forests or timber reserves as defined under the <i>Forestry Act 1959</i> (Qld)	Not present within the project site.
Declared catchment areas under the Water Act	Not present within the project site.
Resources reserves under the NC Act	Not present within the project site.
An area validated as Essential Habitat or Essential Regrowth Habitat from ground-truthing surveys in accordance with the VM Act for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the NC Act	Not present within the project site. Under s20AC of the VM Act, the essential habitat map is a map certified by the chief executive as the essential habitat map for the State and showing, for the State, areas the chief executive reasonably believes are areas of essential habitat for protected wildlife.
Of concern REs identified in the database called 'RE description database' containing RE numbers and descriptions	Of concern REs (5.5.1 and RE 5.5.1x2) are present within the project site as discussed in section 7.3.2.
Threshold REs as defined and listed in Appendix 6 of the Queensland Biodiversity Offsets Policy.	Not present within the project site.
Critically limited REs as defined and listed in Appendix 5 of the Queensland Biodiversity Offsets Policy	Not present within the project site.

Matters of state environmental significance

Terrestrial-related MSES determined to be present include the following as summarised in Table 7.17:

- Regulated vegetation (wetland)
- Regulated vegetation (defined watercourse)
- Connectivity
- Protected wildlife habitat.

Table 7.17 Summary of MSES

MSES value	Relevance to project
Regulated vegetation	
– Prescribed REs that are endangered REs	Not present within the project site. The project site does not intersect with endangered REs (VM class).
– Prescribed REs that are of concern REs	Not present within the project site. The project site does not intersect with of concern REs (VM class).
– A prescribed RE that intersects with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection) (regulated vegetation (wetland))	Access tracks are located within field verified REs that intersect wetlands (at three distinct locations) as mapped on the Vegetation Management Wetland Map.
– A prescribed RE in an area of essential habitat on the essential habitat map for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a plant that is critically endangered wildlife, endangered wildlife or vulnerable wildlife.	Not present within the project site. The project site does not intersect any areas of mapped essential habitat. Essential habitat in Qld identifies areas critical for the survival and recovery of protected species. Under s20AC of the VM Act, the essential habitat map is a map certified by the chief executive as the essential habitat map for the State and showing, for the State, areas the chief executive reasonably believes are areas of essential habitat for protected wildlife. This mapping supports environmental assessments and decision-making under the VM Act, NC Act, EP Act, and EO Act.
– A prescribed RE located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (regulated vegetation (defined watercourse))	Regulated vegetation within the defined distance of a watercourse is present along all mapped watercourses and drainage features within the project site.
– Connectivity areas	The project site is located within a landscape with high connectivity. The DETSI connectivity tool has been run and found the project will not have a reduction in landscape connectivity.
– Wetlands and watercourses: – A wetland in a wetland protection area – A wetland of high ecological significance – A wetland or watercourse in high ecological value waters	Not present within the project site. There are no high ecological value wetlands, high ecological value waterways, or wetland protection areas located within the project site. The waterways within the Bowen River sub-basin, including those within the project site, are wetlands of general ecological significance, and are therefore not considered MSES.
– Designated precinct in a SEA	There is one designated precinct in a SEA (i.e. Channel Country) within the project site. This is situated along the Wilson River and extends upstream and downstream of the project site. A separate RIDA is being sought under RPI Act.

MSES value	Relevance to project
Protected wildlife habitat	
– An area that is shown as a high-risk area on the flora survey trigger map and that contains plants that are critically endangered wildlife, endangered wildlife or vulnerable wildlife	Not present within the project site. The project intersects an area shown as a high-risk area on the protected plants flora survey trigger map between Warri Gate Road and the alignment at KP 83 on an existing vehicle access track as depicted in Figure 7.1. The area does not contain plants that are critically endangered, endangered or vulnerable as listed under the NC Act. The area corresponds to a 1987 record of <i>Rhodanthe rufescens</i> occurring at the Noccundra air strip. <i>Rhodanthe rufescens</i> is listed as near threatened under the NC Act and is not MSES Further, the general exemption of clearing for routine maintenance of infrastructure (e.g. buildings, roads, stockyards, fences and vehicular tracks) applies. If clearing outside of the exemption for an existing vehicle track is proposed, then a flora survey report will be prepared and protected plant clearing permit (or exemption) sought.
– An area that is not shown as a high-risk area on the flora survey trigger map, to the extent the area contains plants that are critically endangered wildlife, endangered wildlife or vulnerable wildlife	Not present within the project site. The project site does not contain plants that are critically endangered, endangered or vulnerable.
– A koala habitat area	Not present within the project site. The project is not located within a koala habitat area.
– A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a special least concern animal	The project site intersects habitat for conservation significant fauna species listed as critically endangered, endangered, vulnerable wildlife or special least concern under the NC Act. Significant residual impacts are assessed in section 7.2.1 of Appendix B (Terrestrial Ecology Assessment).
– Protected areas (national parks, regional parks and nature refuges)	Not present within the project site. Bulloo Downs Nature Refuge occurs south of an east-west section of the pipeline alignment between KP 187 (1 km south) and KP 174 (2 km), before moving northward.
– Highly protected zones of State marine parks	Not present within the project site.
– Fish habitat areas	Not present within the project site.
– Any part of a waterway providing for passage of fish if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway	While waterways providing for fish passage are present within the project site, the proposed works (temporary works) would not limit the passage of fish along the waterway. Refer to Appendix C (Aquatic Ecology Assessment Report) of the Environmental Authority Supporting Information Report (GHD, 2026a) for further detail.
– Marine plants	Not present within the project site.
– Legally secured offset areas	Not present within the project site. Legally secured offset areas under state legislation are not present within or adjacent to the project site, based on publicly available information.

Biosecurity

Confirmed pest species within the project area included the European rabbit (*Oryctolagus cuniculus*), feral cat (*Felis catus*), wild dog (*Canis familiaris*), and feral pig (*Sus scrofa*). Evidence of each species was recorded across the extent of the project site. Introduced species, feral horse (*Equus caballus*) was also observed within the broader survey area.

Barbed wire fences were found across the project area. Grazing pressure was evident across much of the landscape, with some waterholes showing signs of degradation and many areas observed to be heavily grazed. Dieback of numerous trees and shrubs was observed across the project area, consistent with the prevailing arid conditions.

No species observed within the project area were listed as prohibited or restricted invasive plants under the Biosecurity Act. Additionally, no species observed are listed as Weeds of National Significance (WoNS) and no species are listed as a prohibited matter under the *Bulloo Shire Council Biosecurity Plan* (Bulloo Shire Council, 2022). Exotic flora observed was limited to five species which included buffel grass (*Cenchrus ciliaris*), mimosa bush (*Vachellia farnesiana*) smooth mustard (*Sisymbrium erysimoides*), Noogoora burr (*Xanthium occidentale*), and common sowthistle (*Sonchus oleraceus*). A total of five discrete locations were observed to contain exotic species, all of which are restricted to tributaries of the Wilson and Bulloo Rivers at KP 4, KP 18, KP 37, KP 59 and KP 145.

7.3.3 Potential project impacts

Soils and geology

Table 7.18 summarises the potential land related impacts during the construction, operation and decommissioning of the project.

Potential impacts associated with the project relate to principally to erosion and sedimentation around ground disturbing works and spoil stockpiles, and accidental leaks and spills leading to soil contamination.

Table 7.18 Potential impacts – soils and geology

Activity	Impact factors	Impact description
Construction		
Stockpiling	Soil disturbance	Obstruction of overland flow paths, concentration of run off and mobilisation of sediment during rainfall events from stockpiles of excavated materials.
Storage and handling of hazardous materials	Contamination and pollution	Adverse impacts to soil health due to accidental release or spills of contaminants (e.g. fuels, lubricants, chemicals or wastewater associated with construction plant, equipment and temporary facilities) caused by inappropriate storage and handling of hazardous materials.
Clearing and grading	Soil disturbance	Increased runoff velocities, and erosion and sedimentation caused by vegetation clearing, topsoil stripping and surface grading along the pipeline alignment, ancillary areas and watercourse banks.
		Altered overland flow paths, localised ponding and concentration of flow into erosive pathways due to changes in local topography (e.g. windrows, spoil placement, stockpiles, track construction or temporary bunding) caused by earthworks.
Operation		
Routine maintenance, repairs and inspections	Soil disturbance	Temporary disturbance to overland flow paths, increased runoff, and erosion and sedimentation during short-term excavation works and stockpiling of excavated materials for pipeline repairs and maintenance.
Decommissioning		
Decommissioning of the pipeline	Soil disturbance	Increased runoff velocities, and erosion and sedimentation caused by clearing and removal of surface infrastructure.

Land use and tenure

Table 7.19 summarises the potential soils and geology impacts during the construction, operation and decommissioning of the project.

Potential impacts relate to the temporary disruption of existing land uses including occupation of land use of local road infrastructure and, damage to agricultural infrastructure.

Table 7.19 Potential impacts – land use and tenure

Activity	Impact factors	Impact description
Construction		
Clearing and grading	Disruption of land use	Disruption to existing agricultural land uses and farm operations, including the movement of livestock and farm machinery. Impacts and/or damage to farm infrastructure, such as farm dams, livestock handling yards, fencing, silos, holding pens and sheds.
Construction/upgrade of access tracks	Disruption of land use	
Trenching/trenched crossings	Disruption of land use	
Operation		
Routine maintenance, repairs and inspections	Disruption of land use	Disruption to existing agricultural land uses and farm operations, including the movement of livestock and farm machinery. Impacts and/or damage to farm infrastructure, such as farm dams, livestock handling yards, fencing, silos, holding pens and sheds.
Establishment of an easement	Disruption of land use	Restrictions on the nature of activities that can be carried out within the easement, particularly excavations and ground-intrusive works.
Decommissioning		
Decommissioning of the pipeline	Disruption of land use	Disruption to existing agricultural land uses and farm operations, including the movement of livestock and farm machinery. Impacts and/or damage to farm infrastructure, such as farm dams, livestock handling yards, fencing, silos, holding pens and sheds.

Terrestrial ecology

Environmentally sensitive areas

The impacts on Category C ESAs are described in Table 7.20.

Table 7.20 ESA disturbance within the project site

ESA Type	RE impacted	Impact area (ha)	Total (ha)
Of concern RE	5.5.1	98	206.95
	5.5.1 x2	106.3	

Matters of state environmental significance

An assessment has been undertaken against the Queensland *Significant Residual Impact Guideline* (DEHP, 2014) for species and ecological values listed at the state level, that were confirmed present, likely to occur, or considered to have the potential to occur within the project site.

The assessment considers only impacts on MSES. Near threatened species are not considered MSES, nor are least concern plants, and as such, no significant residual impact assessment has been undertaken for *Rhodanthe rufescens* or *Sclerolaena walkeri*, respectively.

A summary of the significant residual impact assessments is provided below in Table 7.21. The assessment determined that the project is likely to result in a significant residual impact on MSES, being regulated vegetation (defined watercourse) for which an offset under the EO Act is likely to be required. A potentially significant residual impact is predicted in relation to protected wildlife habitat for plains-wanderer. A potentially significant impact is predicted for plains-wanderer as MNES under the EPBC Act. Any proposed offset for plains-wanderer would be provided under the EPBC Act and the *EPBC Act Environmental Offsets Policy* (DSEWPC, 2012).

Table 7.21 Summary of likelihood of occurrence and significant residual impact assessment results for MSES

MSES value	Impact area (disturbance footprint) (ha)	Significant Residual Impact / Offset require
Regulated vegetation		
Regulated vegetation (wetland)	0	Unlikely
Regulated vegetation (defined watercourse)		
RE 5.9.3	1.28	Likely
RE 5.3.2	0.6	Likely
RE 5.3.21	2.12	Likely
RE 5.3.21a	0.37	Likely
RE 5.3.4	0.31	Likely
RE 5.3.5	0.2	Likely
RE 5.3.7	0.02	Likely
RE 5.3.9	2.14	Likely
RE 5.5.1	0.53	Likely
RE 5.5.1x2	0.59	Likely
RE 5.5.4	0.16	Likely
RE 5.5.4x1	1.57	Likely
RE 5.6.2	0.29	Likely
RE 5.6.4	0.18	Likely
Connectivity		
Connectivity	N/A	Unlikely
Protected wildlife habitat		
Critically endangered wildlife		
Plains-wanderer	620.7	MNES
Curlew sandpiper	281.3	Unlikely
Endangered wildlife		
Pink cockatoo (eastern)	210.1	Unlikely
Common greenshank	281.3	Unlikely
Red goshawk	670.4	Unlikely
Vulnerable wildlife		
Southern whiteface	688.4	Unlikely
Blue-winged parrot	1,117.6	Unlikely
Painted honeyeater	330.9	Unlikely
Sharp-tailed sandpiper	281.3	Unlikely
Grey falcon	1,117.6	Unlikely
Latham's snipe	281.3	Unlikely
Plains rat	923.1	Unlikely
Special least concern wildlife		
Short-beaked echidna	1,117.6	Unlikely
Fork-tailed swift	1,117.6	Unlikely

MSES value	Impact area (disturbance footprint) (ha)	Significant Residual Impact / Offset require
Caspian tern	281.3	Unlikely
Glossy ibis	281.3	Unlikely

Summary of terrestrial ecological impacts

Table 7.22 summarises the potential terrestrial ecological impacts during the construction, operation and decommissioning of the project.

The significant impact assessments carried out for the project have identified a potential significant residual impact on the Plains wanderer (*Pedionomus torquatus*) (protected under the EPBC Act) and a likely significant residual impact on regulated vegetation (defined water courses) (Qld MSES). These potential and likely significant residual impacts are based principally on:

- clearing and grading during construction resulting in the direct loss of native vegetation and potential habitat, and indirect impacts through edge effects
- soil disturbance during construction resulting in indirect impacts through erosion and sedimentation, changes in surface water quality and hydrology
- potential introduction or spread of invasive species.

Table 7.22 Potential impacts – terrestrial ecology

Activity	Impact factors	Impact description
Construction		
Vehicle and/or machinery usage and maintenance	Soil disturbance	Degradation of adjacent vegetation and/or microhabitats relied upon by reptiles and small terrestrial fauna due to soil disturbance during vehicle movements.
	Vehicle collision	Increased risk of fauna injury or mortality due to vehicle interactions.
	Light; noise	Altered species behaviours due to temporary increases in exposure to light and noise during localised nighttime maintenance.
	Invasive species	Introduction and/or spread of pest animals and weeds along access routes and around stockpile areas, due to the operation of vehicles and machinery, particularly where vehicle hygiene and weed management controls are not adequately implemented.
Storage and handling of hazardous materials	Contamination and pollution	Habitat degradation due to accidental spills of contaminants (e.g. fuels, oils) and concrete washout.
Clearing and grading	Vegetation clearing and habitat degradation	Reduction of shelter and foraging opportunities for fauna due to the removal of established habitat and vegetation (including trees, logs, ground cover and other microhabitats).
		Localised displacement or mortality of fauna due to disturbance of tree hollows, nests and roost sites.
	Soil disturbance; hydrological changes	Degradation of habitat due to altered hydrology and/or concentration of runoff due to soil disturbance and temporary diversions.
Construction/upgrade of access tracks	Dust; light; noise; vibration	Altered species behaviours due to temporary increases in exposure to dust, light, noise and vibration during localised night works.
Trenching/trenched crossings	Soil disturbance	Entrapment of reptiles, small mammals (e.g. plains rat) and ground birds in open trenches.
	Dust; light; noise; vibration	Altered species behaviours due to temporary increases in exposure to dust, light, noise and vibration during localised night works.
Trenchless crossings (e.g. HDD)	Dust; light; noise; vibration	Altered species behaviours due to temporary increases in exposure to dust, light, noise and vibration during localised night works.

Activity	Impact factors	Impact description
Hydrostatic testing	Light; noise; vibration	Altered species behaviours due to temporary increases in exposure to light, noise and vibration during localised night works.
Operation		
Vehicle movement	Invasive species	Introduction and/or spread of weeds along access routes, due to the movement of vehicles during routine maintenance, particularly where vehicle hygiene and weed management controls are not adequately implemented.
	Vehicle collision	Fauna injury or mortality through vehicle strikes during routine maintenance and repairs.
Routine maintenance, repairs and inspections	Dust; light; noise; vibration	Disturbance of fauna during localised routine maintenance.
	Contamination and pollution	Localised habitat degradation and/or injury or mortality of fauna caused by natural gas leakage from pipes.
Decommissioning		
Decommissioning of the pipeline	Vegetation clearing and habitat degradation	Localised habitat degradation and/or injury or mortality of fauna caused by decommissioning activities.

7.3.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of land related impacts during construction, operation and decommissioning of the project are outlined in Table 7.23. The need for and scope of offsets for in relation to MSES are discussed in section 8.4.

Table 7.23 Mitigation and management measures – land

Impact/issue	Mitigation measure	Timing
Soils and geology		
Soil disturbance and erosion	A soil and water management plan would be prepared and implemented as part of the CEMP. The plan would identify reasonably foreseeable risks relating to soil erosion, soil and water quality impacts, including from any contamination, and describe how these risks would be addressed during construction. The plan would be prepared with reference to relevant guidelines, in particular the APGA Code of Environmental Practice (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025). The plan would detail management measures to be implemented, including in relation to: – areas of higher erosion hazard, saline or sodic soils, including the requirement to prepare site and activity-specific erosion and sediment controls – managing topsoil and subsoil stockpiles – managing any unidentified contamination in accordance with an unexpected contaminated finds procedure – managing any accidental spills or leaks of fuels and chemicals – managing the application of dust suppression water, including the quality and quantity of water used, and the rate of application – arrangements for managing wet weather, including monitoring potential high-risk events (such as storms) and specific controls to be applied to dispersive soils and follow-up measures – the process for progressively stabilising disturbed areas in accordance with the rehabilitation strategy.	Pre-construction, construction

Impact/issue	Mitigation measure	Timing
	Site and activity-specific ESCP/s would be prepared by a suitably qualified erosion and sediment control specialist and include erosion and sediment controls appropriate for site-specific soil types, locations and activities, including the use of soil ameliorants (e.g. gypsum) or polymers as required. The ESCP/s would be prepared with reference to the APGA Code of Environmental Practice (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025).	Construction
Contamination of soils	Storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with <i>AS 1940:2017 – The storage and handling of flammable and combustible liquids</i> .	Construction, operation
Wastewater management	The wastewater treatment systems and effluent irrigation areas at the temporary accommodation facilities would be designed, installed, operated and maintained in accordance with <i>AS 1547:2012 On-site domestic wastewater management</i> .	Construction, operation, decommissioning
Decommissioning impacts on soil and land	A soil and water management plan would be included in the DEMP and implemented during decommissioning to minimise potential impacts on soils and water quality. The plan would include measures for erosion control, management of any contaminated areas and stabilisation of disturbed areas.	Decommissioning
Land use and tenure		
Impacts on land use and property	Design and construction planning would continue to be refined to manage potential impacts on land uses and properties in consultation with landholders.	Design, pre-construction
	Construction property management plans would be prepared in consultation with landholders affected by the pipeline easement. The plans would include: – measures to reduce property impacts, including impacts on agricultural operations, as far as practicable – measures to provide assurance that disruption to farm operations, including the movement of livestock and farm machinery, is as agreed with individual landholders – details of any required adjustments to and/or replacement of affected farm infrastructure, such as farm dams, livestock handling yards, fencing, silos, holding pens and sheds – biosecurity and rehabilitation measures to be implemented on individual properties.	Design, construction
Rehabilitation of construction areas	A rehabilitation strategy would be prepared to guide rehabilitation planning, implementation, monitoring and maintenance of disturbed areas (not occupied by permanent project infrastructure) following the completion of construction. The strategy would: – identify rehabilitation objectives, criteria and requirements in accordance with the APGA Code of Environmental Practice (APGA, 2022) – establish roles and responsibilities – define rehabilitation actions and requirements – define monitoring and maintenance requirements – describe adaptive management approaches if monitoring identifies a need – require consultation with landholders on rehabilitation requirements.	Pre-construction, construction
Terrestrial ecology		
Vegetation clearing	Design and construction planning would continue to be refined to further avoid or minimise impacts on native vegetation and fauna habitat as far as practicable	Design, pre-construction
	Pre-clearing surveys would be undertaken prior to construction within sensitive areas, defined as follows: – vegetated land – areas of riparian vegetation – areas identified by the project ecologist as supporting known or potential habitat, for ground-dwelling and arboreal species. During pre-clearing surveys, trees in the disturbance footprint with would be marked and avoided where practicable.	Pre-construction, construction

Impact/issue	Mitigation measure	Timing
	GPS-enabled machinery post physical marking of the CRoW boundary and geofenced construction boundaries. Respreading of topsoil and ripping to occur as soon as practicable following trench backfilling, including spreading of vegetation and large woody debris where feasible. Tree hollows in hollow-bearing trees within areas to be cleared would be assessed by the ecologist for suitability for salvage and relocation. Fauna detected during surveys would be relocated in accordance with the appropriate animal ethics and legislative permits.	
Habitat degradation	Limit disturbance to the CRoW, extra work spaces and approved access tracks. Locate spill kits at fuel storage/transfer points. Remove regulated waste to appropriately licensed facilities. Implement responsible waste management protocols, including the use of secure temporary containers and offsite disposal of all wastes. Develop a site-specific ESCP in accordance with IECA standards (2025), including the protection of sensitive habitats using erosion and sediment controls. All stripped topsoil and sub-soils are to be placed outside of waterways in designated stockpiling areas located above the top of bank and secured by erosion and sediment controls. Stabilise disturbed areas promptly following completion of works. Incorporate dust minimisation measures through the CEMP. Storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with <i>AS 1940:2017 – The storage and handling of flammable and combustible liquids</i>.	Construction
Fauna injury and mortality	Install fauna ramps every 500 m and fauna refuge bags every 100–200 m, and undertake daily inspections of trenches. Any fauna handling must be conducted under the relevant permits. Where required, high-risk and low-risk SMPs would be prepared for threatened species, in accordance with the NC Act. Prepare and implement incident response procedures for any wildlife injury or mortality during construction. Implement trench management measures including daily inspections of trenches.	Pre-construction, construction
Construction impacts on terrestrial ecology	Biodiversity offsets would be finalised in accordance with the EO Act and the <i>EPBC Act Environmental Offsets Policy</i> (DSEWPC, 2012).	Design
Biosecurity	A biosecurity management plan would be prepared and implemented as part of the CEMP, including measures to minimise the potential for biodiversity risks in accordance with the general biosecurity obligation under the Biosecurity Act (Qld).	Pre-construction, construction
Hydrological changes	Develop and implement a site-specific ESCP in accordance with IECA standards (IECA, 2008), including the protection of sensitive habitats using erosion and sediment controls, and the management of dispersive soils. Place stripped soils outside waterways and stabilise using erosion controls. Undertake bed and bank stabilisation as soon as practicable post completion of works once subsurface is achieved. Design crossings to maintain floodplain connectivity and natural hydrology. Incorporate flood/storm contingency procedures to protect EVs during severe weather.	Pre-construction, construction
Disturbance of fauna from increased dust, light, noise and vibration	Use water carts to manage dust generation on the CRoW and access tracks. Direct lighting away from sensitive habitats where possible. Use broadband reversing alarms instead of tonal beepers. Minimise night works and artificial light to safety requirements to reduce spill into adjacent bushland.	Construction

Impact/issue	Mitigation measure	Timing
	Maintain equipment to keep noise within acceptable limits, with regular monitoring of dust and noise. Stabilise disturbed areas promptly following completion of works. Limit construction works to daylight hours wherever feasible to reduce light and noise impacts to nocturnal fauna.	

7.3.5 Risk assessment

Soils and geology

Table 7.24 summaries the risks of potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

Potential impacts are readily managed with standard erosion and sedimentation control measures, and good practice handling and management of potentially contaminating materials, including effective contamination and clean-up. With these standard approaches in place, the risks to soils and geology would be low during construction and negligible during operation and decommissioning.

Table 7.24 *Potential risks – soils and geology*

Project phase	Risk	Initial risk	Residual risk
Construction	Stockpiling	Moderate	Low
Construction	Storage and handling of hazardous materials	Moderate	Low
Construction	Clearing and grading	Moderate	Low
Construction	Clearing and grading	Moderate	Low
Operation	Routine maintenance, repairs and inspections	Moderate	Negligible
Decommissioning	Decommissioning of the pipeline	Moderate	Negligible

Land use and tenure

Table 7.25 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

The risk of these impacts can be effectively managed through engagement with affected landholder/ agricultural operator, and careful planning and scheduling to minimise the duration and extent of land use disruptions. With appropriate mitigation, the risk of land use disruption would be low during construction and negligible during operation and decommissioning.

Restrictions would need to be applied to the activities that can be carried out above and around the gas pipeline, to protect the infrastructure. These restrictions would relate principally to excavations and ground intrusive works, with impacts to existing grazing activities relatively low. Appropriate commercial arrangements would be established with affected landholders to reflect the restrictions associated with the pipeline on the use of the land.

Table 7.25 *Potential risks – land use and tenure*

Project phase	Risk	Initial risk	Residual risk
Construction	Clearing and grading	Moderate	Low
Construction	Construction/upgrade of access tracks	Moderate	Low
Construction	Trenching/trenched crossings	Moderate	Low
Operation	Routine maintenance, repairs and inspections	Low	Negligible
Operation	Establishment of a pipeline easement	Low	Low
Decommissioning	Decommissioning of the pipeline	Low	Negligible

Terrestrial ecology

Table 7.26 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

With the application of standard erosion and sedimentation control measures, spill and leak management including clean-up requirements, and effective biosecurity management, potential risks of indirect impacts would be low. Despite reasonable endeavours to avoid and minimise the need for vegetation clearing during construction, some vegetation and fauna habitat loss would be unavoidable and underpins the outcomes of the significant residual impact assessments summarised in Table 7.21 (detailed assessments are included in Appendix B).

Table 7.26 Potential risks – terrestrial ecology

Project phase	Risk	Initial risk	Residual risk
Construction	Vehicle and/or machinery usage and maintenance (soil disturbance)	Moderate	Low
Construction	Vehicle and/or machinery usage and maintenance (vehicle collision)	Moderate	Low
Construction	Vehicle and/or machinery usage and maintenance (light, noise)	Low	Low
Construction	Vehicle and/or machinery usage and maintenance (invasive species)	Moderate	Low
Construction	Storage and handling of hazardous materials	Moderate	Low
Construction	Clearing and grading (vegetation clearing and habitat degradation)	Moderate	Moderate
Construction	Clearing and grading (soil disturbance; hydrological changes)	Moderate	Low
Construction	Construction/ upgrade of access tracks	Low	Low
Construction	Trenching/trenched crossings (soil disturbance)	Moderate	Low
Construction	Trenching/trenched crossings (dust, light, noise, vibration)	Low	Low
Construction	Trenchless crossings (e.g., HDD)	Low	Low
Construction	Hydrostatic testing	Low	Low
Operation	Vehicle movement (invasive species)	Moderate	Low
Operation	Vehicle movement (collision)	Moderate	Low
Operation	Routine maintenance, repairs and inspections	Low	Negligible
Decommissioning	Decommissioning of the pipeline	Moderate	Negligible

7.4 Noise

7.4.1 Relevant project aspects

The following construction activities have the potential to impact on EVs associated with noise and vibration:

- clearing and grading
- construction of temporary accommodation facilities
- stringing and bending
- trenching/trenched crossings
- trenchless crossings (e.g. HDD)
- lowering in and backfilling.

Noise generating activities during the ordinary operating conditions of the pipeline are expected to include the routine operation and maintenance program and gas releases at the existing Meadows scraper station during internal cleaning only. No sensitive receptors are within this distance to the scraper stations and therefore no adverse noise impacts would be associated with operation of the project.

At the end of the project's operational life, decommissioning would be undertaken in accordance with the structured, risk-based process as required by applicable legislation and industry standards (currently the P&G Act and AS 2885). Specific decommissioning activities would be assessed through this process and would generally involve reducing remaining gas in the pipeline as much as possible, managing residual gas, disconnecting and

removing surface facilities and, where required by the segment analysis and abandonment plan, cutting, capping and filling sections of the pipeline. The pipeline would be left in place to minimise land disturbance, and only limited areas would be subject to surface works.

7.4.2 Environmental values

Noise environment

The project would be located in an isolated rural area, in the far-west of Qld. The existing noise environment is very quiet, as there are no major noise sources, such as roads or industries, present in the area.

As such, the existing background noise levels are expected to be similar to, or below, the minimum background noise levels in Table 2 of *Prescribing noise conditions for environmental authorities for petroleum activities* (DETSI, 2025g), presented in Table 7.27.

Table 7.27 Minimum background noise levels for isolated rural areas

Time of day	Minimum background noise level (dBA)
7:00am to 6:00pm	35
6:00pm to 10:00pm	30
10:00pm to 6:00am	25
6:00am to 7:00am	30

Sensitive receptors

Noise sensitive receptors have been identified in accordance with the Environmental Protection (Noise) Policy 2019, as summarised in Table 7.28.

Most sensitive receptors are located more than 2 km from the project site and are dwellings or temporary accommodation. Receptor R1 (unoccupied) is located nearest to the CRoW, approximately 254 m away.

Table 7.28 Sensitive receptors (noise)

Receptor ID	Receptor category	Coordinates in ESPG 7854 (m)		Distance to project site (m)	
		Easting (m)	Northing (m)	CRoW (m)	Access roads/tracks used for construction (m)
R1	Residential (unoccupied)	664,292	6,972,453	254	171
R2	Residential	668,827	6,932,553	1,998	1,993
R4	Residential	660,225	6,969,538	2,345	53
R5	Residential	617,801	6,796,298	2,846	1,551
R6	Passive recreation (park or garden)	656,995	6,921,682	2,950	382
R7	Residential	617,748	6,831,651	3,007	1,488
R10	Commercial (community centre)	656,592	6,921,982	3,124	33
R11	Commercial	656,547	6,922,014	3,145	16
R12	Residential	656,545	6,921,971	3,170	13
R13	Temporary accommodation	656,488	6,921,978	3,213	41
R14	Passive recreation (park or garden)	669,339	6,937,678	3,281	1,840
R15	Commercial	655,150	6,919,455	4,496	1,073

7.4.3 Potential project impacts

Table 7.29 summarises the potential noise impacts during the construction, operation and decommissioning of the project.

Table 7.29 Potential impacts – noise

Activity	Impact factors	Impact description
Construction		
Clearing and grading	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during vegetation removal, levelling and top soil stripping.
Construction of temporary accommodation facilities	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during works required for the construction of the temporary accommodation facilities.
Stringing and bending	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during the stringing and bending of the pipeline.
Trenching/trenched crossings	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during the operation of construction plant and equipment (e.g. excavators, rock hammers and, where necessary, controlled blasting).
Trenchless crossings (e.g. HDD)	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during the operation of specialised drilling equipment, support plant and ancillary machinery.
Lowering in and backfilling	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values by the use of excavators, side booms, compactors and other equipment to place the pipeline within the trench and backfill.
Decommissioning		
Decommissioning the pipeline	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during decommissioning of the pipeline including temporary truck movements and equipment operation.
Removal of surface infrastructure	Noise; vibration	Impacts to human health, wellbeing and amenity and/or disruption of species behaviours due to the generation of noise and/or vibration in exceedance of guideline values during the removal of surface infrastructure including temporary truck movements and equipment operation.

7.4.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of noise impacts during construction, operation and decommissioning of the project are outlined in Table 7.30.

Table 7.30 Mitigation measures – noise

Impact/issue	Mitigation measure	Timing
Construction noise and vibration	A noise and vibration management plan would be prepared and implemented as part of the CEMP for all construction activities within 1km of a noise sensitive receptor. The plan would identify: – potentially high noise and vibration generating activities associated with construction – measures to manage identified impacts – arrangements for consultation with potentially affected sensitive receptors, including notification and complaint handling procedures – an out-of-hours work protocol to define the process for considering, approving and managing out of hours work. The protocol would include implementing feasible and reasonable measures and communication requirements.	Pre-construction, construction
Blasting	The need for blasting would be confirmed during detailed construction planning. In the event that blasting is required, the blast parameters would be designed, and allowable charge mass confirmed, to achieve the airblast overpressure and ground vibration requirements of the <i>Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration</i> (ANZEC, 1990). This would include trial blasting and airblast/vibration monitoring to confirm site-specific constraints and refine safe blasting distances.	Pre-construction
Decommissioning of the pipeline	A noise and vibration subplan will be included in the decommissioning environmental management plan and implemented during decommissioning to minimise the potential for impacts on sensitive receptors. Measures will include, but not be limited to: – scheduling noisier activities during standard hours where feasible – arrangements for consultation with affected sensitive receptors, including notification and complaint handling procedures – measures to manage potential noise impacts.	Decommissioning

7.4.5 Risk assessment

While construction and decommissioning activities have the potential to generate noise, the limited number of receptors and the significant separation distances from the project site effectively reduce the risk of material impacts to negligible levels. The temporary and transient nature of these activities would also act to mitigate the risk of significant and extended noise impacts at the closest residential receptor.

Table 7.31 summaries the risks of the potential impacts have been evaluated without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

Table 7.31 Potential risks – noise

Project phase	Risk	Initial risk	Residual risk
Construction	Clearing and grading	Low	Negligible
Construction	Construction of temporary accommodation facilities	Low	Negligible
Construction	Stringing and bending	Low	Negligible
Construction	Trenching/trenched crossings	Low	Negligible
Construction	Trenching/trenched crossings (blasting)	Moderate	Low
Construction	Trenchless crossings (e.g., HDD)	Low	Negligible
Construction	Lowering in and backfilling	Low	Negligible
Decommissioning	Decommissioning of the pipeline	Low	Negligible

7.5 Community (traffic)

This section summarises potential traffic related impacts of the project, supported by the Traffic Impact Assessment provided in Appendix G.

The project would change the traffic profile of local and regional roads during construction and may indirectly affect the community through road network safety and capacity. The project would otherwise have limited impact on local communities and individual stakeholders given the sparse population around the project site and significant separation distances between residential receptors and the project site. Appendix G. Potential noise impacts on the local community are assessed separately in Section 7.4.

7.5.1 Relevant project aspects (traffic)

Many of the identified impacts may occur during the construction and operational phases, as they are largely influenced by existing road conditions. However, the likelihood and severity of impacts are expected to be greater during the construction phase due to increased heavy vehicle movements.

Vehicle and/or machinery usage and maintenance may impact on EVs associated with transport and traffic during construction. Operational activities would primarily involve periodic vehicle access for inspection, maintenance and repair of the pipeline. Vehicle movements during this phase would be infrequent, short in duration and limited to established access routes.

Decommissioning activities would be significantly less intensive than construction activities, involving fewer personnel, less equipment and shorter durations of work at any given location. Due to the minimal traffic generation expected to occur during the decommissioning of the pipeline (and the fact that this traffic is less than the assessed peak construction period), no further assessment for this stage has been undertaken.

7.5.2 Environmental values (traffic)

Pipeline construction materials would be imported via Adelaide, transported by rail to Broken Hill in NSW and then transported by road to the Nockatunga construction compound for the first section of pipeline coverage (KP 0–143 km).

The transport route from Broken Hill to the Nockatunga construction compound would generally follow the Silver City Highway in NSW and Warri Gate Road in Qld, travelling through the township of Tibooburra in NSW (located approximately 48 km south of the Qld–NSW border).

Other roads and key intersections leading to and from the project site that may be directly or indirectly affected during construction and operation include:

- Warri Gate Road from the QLD-NSW border to its termination with Bulloo Developmental Road
- Cooper Developmental Road to the northernmost construction access track
- Bulloo Developmental Road from the intersection of Cooper Developmental Road to the township of Thargomindah
- Wompah Gate Road
- Tickalara Road.

Table 7.32 summarises the characteristics of key roads located in Qld that would be used for access to the project site.

Section 3.2.5 of the Bulloo Shire Planning Scheme (Bulloo Shire Council, 2019) states that Bulloo Developmental Road ‘carries significant volumes of heavy transport in support of the beef and oil and gas industries’, and Warri Gate Road is considered ‘a major connector to New South Wales’.

Table 7.32 Key road characteristics

Road attribute	Warri Gate Road	Cooper Developmental Road	Bulloo Developmental Road	Wompah Gate Road	Tickalara Road
Jurisdiction	Bulloo Shire Council (BSC)	Department of Transport and Main Roads (TMR)	TMR	BSC	BSC
BSC road classification	Primary road	State highway	State highway	Secondary Road	Secondary Road
Speed limit (km/h)	100 (rural default)	100	100	100 (rural default)	100 (rural default)
Lane formation	Two-lane / two-way	Two-lane / two-way	Two-lane / two-way	Two-lane / two-way	Two-lane / two-way
Sealed width	5 m	5 m	5 m	Unsealed	Unsealed
Road lighting	Nil	Nil	Nil	Nil	Nil

7.5.3 Potential project impacts (traffic)

Table 7.33 summarises the potential traffic impacts during the construction, operation and decommissioning of the project.

Traffic related impacts relate to potential changes in road safety during construction and commissioning.

Table 7.33 Potential impacts – community (traffic)

Activity	Impact factors	Impact description
Construction		
Vehicle and/or machinery usage and maintenance	Road safety	Immobilisation of heavy vehicles, and off-carriageway type crashes on Warri Gate Road caused by damage to the ground surface on unsealed sections of road)
		Head-on and off-carriageway type crashes on Warri Gate Road due to narrow carriageway, with no sealed road shoulder; and two-way movement, especially when a heavy vehicle is involved and is likely to require one vehicle to stop or slow on the side of the road to let the other pass
		Off-carriageway type crashes on Warri Gate Road as a result of poor visibility due to a lack of street lighting)
		Off-carriageway and roll-over type crashes on Warri Gate Road due to heavy vehicles traveling on shoulders to avoid damaged road sections caused by flooding in the area)
		Closure of unsealed roads (at least 24 hours) due to heavy rainfall and flash flooding, with drivers required to stop (or potentially travel back) during forecast rain events
		Increased risk of run-off road type crashes on Warri Gate Road caused by fatigue due to absence of heavy vehicle rest stop provisions)
		Increased risk of rear-end or side-on crashes due to increased proportion of heavy vehicles expected to turn in/out of the vehicle access just before the Bulloo Developmental Road intersection)

7.5.4 Management practices (traffic)

Mitigation and management measures that would be applied to minimise the risk of traffic impacts during construction, operation and decommissioning of the project are outlined in Table 7.34.

Table 7.34 Mitigation and management measures – community (traffic)

Impact/issue	Mitigation measure	Timing
Construction impacts on roads and transport network	A traffic management plan would be prepared and implemented as part of the CEMP. The plan would detail measures to minimise potential traffic, transport and access impacts during construction, including measures to maintain the safe and efficient operation of roads and transport infrastructure. Appropriate traffic control measures would be adopted to manage road user safety, such that it is not impacted by construction-related vehicles travelling to and from the project site. The plan would include a driver's code of conduct for haulage operations to define appropriate driver behaviour and safety requirements for drivers operating heavy vehicles on public roads. The plan would be prepared in consultation with relevant stakeholders, including the TMR, Quilpie and Bulloo Shire Councils.	Pre-construction, construction
Local roads and private property access	Condition surveys of local roads and access tracks proposed to be used or affected during construction would be completed prior to and following construction, and provided to the relevant road authority.	Pre-construction, construction
Oversize overmass (OSOM) vehicles	The construction contractor would confirm the dimensions and proposed routing of OSOM vehicles to be used and apply for the necessary permits prior to undertaking OSOM movements. The assessment would consider the shortest and least trafficked route for OSOM vehicles to minimise the risk to other motorists.	Pre-construction, construction
Decommissioning impacts on roads, transport and access	A traffic management plan would be included in the DEMP and implemented during decommissioning to manage potential impacts on traffic, transport and access. The plan would include, but not be limited to: – appropriate traffic control measures – driver's code of conduct for haulage operation – consultation with relevant stakeholders, including landholders and Bulloo Shire Council.	Decommissioning

7.5.5 Risk assessment

Table 7.35 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

Road safety impacts would be a factor of road design, quality and maintenance standard, driver behaviour, and traffic volumes. To the extent possible traffic and driver behaviour would be managed to minimise potential contributions to deterioration in road safety.

Table 7.35 Potential risks – community (traffic)

Project phase	Risk	Initial risk	Residual risk
Construction	Vehicle and/or machinery usage and maintenance (immobilisation of heavy vehicles, and off-carriageway type crashes on Warri Gate Road caused by damage to the ground surface on unsealed sections of road)	Moderate	Low
Construction	Vehicle and/or machinery usage and maintenance (head-on and off-carriageway type crashes on Warri Gate Road due to narrow carriageway, with no sealed road shoulder; and two-way movement, especially when a heavy vehicle is involved and is likely to require one vehicle to stop or slow on the side of the road to let the other pass)	High	Moderate
Construction	Vehicle and/or machinery usage and maintenance (off-carriageway type crashes on Warri Gate Road as a result of poor visibility due to a lack of street lighting)	Moderate	Low

Project phase	Risk	Initial risk	Residual risk
Construction	Vehicle and/or machinery usage and maintenance (off-carriageway and roll-over type crashes on Warri Gate Road due to heavy vehicles travel on shoulders to avoid damaged road sections caused by flooding in the area)	Moderate	Low
Construction	Vehicle and/or machinery usage and maintenance (closure of unsealed roads (at least 24 hours) due to heavy rainfall and flash flooding, with drivers required to stop (or potentially travel back) during forecast rain events)	Moderate	Low
Construction	Vehicle and/or machinery usage and maintenance (increased risk of run-off road type crashes on Warri Gate Road caused by fatigue due to absence of heavy vehicle rest stop provisions)	Moderate	Negligible
Construction	Vehicle and/or machinery usage and maintenance (increased risk of rear-end or side-on crashes due to increased proportion of heavy vehicles expected to turn in/out of the vehicle access just before the Bulloo Developmental Road intersection)	Negligible	Negligible
Decommissioning	Decommissioning impacts on roads, transport and access.	Moderate	Low

7.6 Heritage

This section summarises the potential impacts of the project on both indigenous and non-indigenous heritage during construction, operation and decommissioning.

7.6.1 Relevant project aspects

Non-indigenous heritage

Construction activities would be unlikely to directly or indirectly impact on identified non-Indigenous heritage sites. There is a low potential for previously unidentified buried artefacts or sites of non-Indigenous cultural heritage significance to be encountered during construction.

Two local heritage sites (a homestead and historic cemetery) have been confirmed to be located outside of the project site.

Indigenous cultural heritage

Construction activities may disturb previously unrecorded Indigenous cultural heritage artefacts. The implementation of appropriate mitigation measures, including heritage management procedures and stop-work protocols, substantially reduces this risk. Consultation with the relevant Traditional Owners has been undertaken, and has informed project planning and mitigation. With these measures in place, the likelihood of adverse impacts to cultural heritage values is expected to be low.

The following construction activities have been identified with the potential to impact on EVs associated with indigenous cultural heritage:

- construction/upgrade of access tracks
- trenching/trenched crossings.

7.6.2 Environmental values

Non-indigenous heritage

In accordance with the *Application requirements for petroleum activities* (DESI, 2024), EVs relevant to heritage include any heritage places (i.e. non-Indigenous and other historic-period heritage) within the project site recognised in:

- the Queensland Heritage Register, including state heritage places, archaeological places, or protected areas
- local heritage registers for places of cultural heritage significance and/or heritage overlays or other lists of heritage places found in local planning schemes.

The Noccundra Hotel is the only place listed on the QLD Heritage Register within the Bulloo region, and is, located approximately 3.5 km west of the project site.

There are five places listed on the Bulloo Shire Council Local Heritage Register that are located within land parcels traversed by the pipeline alignment. As the Bulloo Shire Council Local Heritage Register provides an indicative location for listed sites (e.g. nearby roads and the lot on plan they are located within), desktop searches and aerial imagery were used to verify the location of these sites in relation to the project site as described in Table 7.36. While some site locations could not be verified, extensive surveys undertaken by APA for the project confirm that these local heritage places are not within the project site boundaries.

Table 7.36 Local heritage places relevant to the project site

Name	Address	Real property description	Distance from project site (km)
Nockatunga Station	Thargomindah, QLD 4492	Lot 252 on RP208578	Approximately 6.5 km east of the project site.
Old Tickalara Homestead, Tickalara Station, Barioolah (Baryulah) Station	Thargomindah, QLD 4492	Lot 468 on PH1653	Approximately 8 km west of the project site.
Bransby Homestead	Bransby, Nockatunga, QLD 4492	Lot 3 on BI22	Location unable to be verified.
Noccundra Historic Cemetery	Approximately 600 m north of Noccundra airstrip, off Noccundra-Warri-Warri Road, Nockatunga, QLD 4492	Lot 3 on BI22	Location unable to be verified (not visible in aerial imagery). The project site is located approximately 2.6 km east and south-east of the Noccundra airstrip
Bulloo Downs Homestead	Adelaide Gate Road, Thargomindah, QLD 4492	Lot 1673 on PH2276	Location unable to be verified.

Indigenous heritage and cultural values

In order to obtain information regarding Indigenous heritage and cultural values present within the project site, the following activities were undertaken:

- consultation with relevant Aboriginal parties
- desktop searches of relevant registers and records, mapping and available literature
- review of the regulatory framework relevant to indigenous cultural heritage.

A detailed cultural heritage survey of the proposed project works areas would be undertaken in accordance with the requirements of the approved CHMA.

A search of the Aboriginal and Torres Strait Islander Cultural Heritage Database and Register (DWATSPIM, 2021) identified 67 individual cultural heritage site points within 20 km of the pipeline alignment including stone arrangements, artefact scatters, hearth/ovens, quarries, scarred/carved trees, burials and a contact site. However, none of these sites intersect with the pipeline alignment itself.

7.6.3 Potential project impacts

Table 7.37 summarises the potential heritage impacts during the construction, operation and decommissioning of the project.

Table 7.37 Potential impacts – heritage

Activity	Impact factors	Impact description
Construction		
Construction/upgrade of access tracks	Interaction with a heritage place or heritage values	Damage or disturbance to recorded Aboriginal cultural heritage places or values during ground disturbing works, resulting in harm to cultural values and regulatory non-compliance.
Construction/upgrade of access tracks	Interaction with a heritage place or heritage values	Unintentional damage or destruction of previously unidentified Aboriginal cultural heritage items or places during the construction/upgrade of access tracks.
Trenching/trenched crossings	Interaction with a heritage place or heritage values	Damage or disturbance to recorded Aboriginal cultural heritage places or values during ground disturbing works, resulting in harm to cultural values and regulatory non-compliance.
Trenching/trenched crossings	Interaction with a heritage place or heritage values	Unintentional damage or destruction of previously unidentified Aboriginal cultural heritage items or places during the construction of trenchless crossings.

7.6.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of heritage impacts during construction, operation and decommissioning of the project are outlined in Table 7.38.

Table 7.38 Mitigation and management measures – heritage

Impact/issue	Mitigation measure	Timing
Unexpected heritage finds and human remains	An unexpected finds and human skeletal remains procedure would be developed and included in the cultural heritage management plan (CHMP) to provide a consistent method for managing any unexpected Aboriginal or non-Aboriginal heritage items or human skeletal remains.	Pre-construction

7.6.5 Risk assessment

Table 7.39 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

The project may impact unknown or unexpected heritage items that are discovered, particularly during construction of the project. An unexpected finds protocol would be developed and implemented to reduce the risk of heritage impacts to low.

Table 7.39 Potential risks – heritage

Project phase	Risk	Initial risk	Residual risk
Heritage			
Construction	Construction/upgrade of access tracks	Moderate	Low
Construction	Construction/upgrade of access tracks	Moderate	Low
Construction	Trenching/trenched crossings	Moderate	Low
Construction	Trenching/trenched crossings	Moderate	Low

7.7 Waste

This section summarises the assessment of waste impacts during construction, operation and decommissioning of the project. It is supported by the Waste Assessment provided in Appendix F.

7.7.1 Relevant project aspects

Most project waste would be generated during construction, with limited quantities of waste expected to be generated during operations. Key construction activities include the operation of construction site offices and a temporary accommodation facility, site preparation, pipeline installation and construction of new access roads and upgrades to existing access roads.

The storage and handling of hazardous materials during construction may impact EVs associated with waste. Operational activities would generate minimal waste from end-of-line facility operations and maintenance activities (e.g. vegetation clearance, pipeline component repair and replacement).

Decommissioning activities would generate minimal waste from the removal of surface facilities and infrastructure. All surface facilities would be dismantled and removed for disposal or recycling off site, in accordance with the relevant waste classification framework in place at the time, and the waste management hierarchy.

7.7.2 Environmental values

The dominant existing land use within the project site is grazing of native vegetation by cattle. Under existing conditions, waste generation within the project site is limited to small quantities of organic waste from agricultural activities, primarily animal manure. No other routine waste-generating activities currently occur within the project site.

The project site does not contain any waste storage areas, landfills, transfer stations or waste treatment facilities.

Waste generated within the surrounding region is managed through established local government waste collection and disposal systems that service rural land uses. These existing arrangements provide lawful waste management pathways within the broader receiving environment.

7.7.3 Potential project impacts

Table 7.40 summarises the potential waste impacts during the construction, operation and decommissioning of the project.

Table 7.40 Potential impacts – waste

Activity	Impact factors	Impact description
Construction		
Storage and handling of hazardous materials	Contamination and pollution	Risk to human health from direct contact, ingestion or inhalation of hazardous waste materials.
		Contamination of air, soil, surface water and/or groundwater through the inappropriate storage, transport and disposal of waste.
	Air quality and odour	Odour generated during transportation and handling of waste.
	Invasive species	Attraction of pests and/or disease vectors due to irregular or disrupted collections of waste enabling build up.
Operation		
Routine maintenance, repairs and inspections	Contamination and pollution	Contamination of air, soil, surface water and/or groundwater through the inappropriate disposal of waste from vehicle/plant equipment maintenance (such as adhesives, lubricants, waste fuels and oils, chemicals, engine coolant, batteries, tyres, etc.).
Decommissioning		
Removal of surface infrastructure	Contamination and pollution	Contamination of air, soil, surface water and/or groundwater through the inappropriate disposal of waste from decommissioning activities.

7.7.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of waste impacts during construction, operation and decommissioning of the project are outlined in Table 7.41.

Table 7.41 Mitigation and management measures – waste

Impact/issue	Mitigation measure	Timing
Construction waste management	Measures to manage waste would be included in the CEMP and implemented during construction. The measures would adopt circular economy principles and the waste hierarchy contained in the <i>Waste Reduction and Recycling Act 2011</i> . The measures would detail processes, responsibilities and actions to manage waste and minimise the potential for impacts during construction.	Pre-construction, construction
Waste classification and management	All waste would be classified and managed in accordance with the EP Act and the Environmental Protection Regulation 2019 (or any relevant resource recovery orders and exemptions). This includes the handling and disposal of regulated and/or hazardous waste by appropriately qualified and licenced contractors.	Construction, operation, decommissioning
Decommissioning waste management	Measures to manage waste would be included in the DEMP and implemented during decommissioning. The measures would detail processes, responsibilities and actions to manage waste and minimise the potential for impacts during decommissioning in accordance with relevant statutory requirements and waste guidelines.	Decommissioning

7.7.5 Risk assessment

Table 7.42 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

The project would generate waste streams typical of major linear infrastructure projects, particularly during construction. While some of these wastes may impact the environment, the risk of this impact would be negligible with the application of standard waste management practices.

Table 7.42 Potential risks – waste

Project phase	Risk	Initial risk	Residual risk
Waste			
Construction	Storage and handling of hazardous materials (risk to human health from direct contact, ingestion or inhalation of hazardous waste materials)	Low	Negligible
Construction	Storage and handling of hazardous materials (contamination of air, soil, surface water and/or groundwater through the inappropriate storage, transport and disposal of waste)	Moderate	Low
Construction	Storage and handling of hazardous materials (odour generated during transportation and handling of waste)	Low	Negligible
Construction	Storage and handling of hazardous materials (attraction of pests and/or disease vectors due to irregular or disrupted collections of waste enabling build up)	Low	Negligible
Operation	Routine maintenance, repairs and inspections (contamination of air, soil, surface water and/or groundwater through the inappropriate disposal of waste from vehicle/plant equipment maintenance (such as adhesives, lubricants, waste fuels and oils, chemicals, engine coolant, batteries, tyres, etc.)	Low	Negligible
Decommissioning	Removal of surface infrastructure (contamination of air, soil, surface water and/or groundwater through the inappropriate disposal of waste from decommissioning activities)	Low	Negligible

7.8 Water

This section summarises the assessment of potential impacts during construction, operation and decommissioning of the project in relation to:

- surface water and groundwater, supported by the Water Assessment provided in Appendix A
- aquatic ecology, supported by the Aquatic Ecology Assessment provided in Appendix C.

7.8.1 Relevant project aspects

Surface water and groundwater

The following construction activities have the potential to impact on EVs associated with water:

- stockpiling
- storage and handling of hazardous materials
- clearing and grading
- trenching/trenched crossings
- trenchless crossings (e.g. HDD)
- water extraction to support construction activities and hydrostatic testing.

Operational activities would consist of routine maintenance and repair works and occasional vehicle movements. These activities would occur intermittently over the operational life of the pipeline and would be typically small in scale and localised in nature. Potential risks during operation would be primarily associated with the legacy effects of construction and ongoing maintenance activities.

During decommissioning, most of the pipeline would remain in place, which would minimise further disturbance of the land, watercourse crossings, shallow sub-surface and groundwater, and established vegetation. Disturbance associated with the removal of surface infrastructure and sections where cutting, capping and filling would be required, would be localised. Consequently, potential impacts on hydrology, flooding and groundwater resources would be short-term and spatially limited, with no anticipated catchment-scale effects.

Aquatic ecology

The following construction activities have the potential to impact on EVs associated with aquatic ecology:

- vehicle and/or machinery usage and maintenance
- stockpiling
- storage and handling of hazardous materials
- clearing and grading
- trenching/trenched crossings.

Operational activities would include periodic inspection, maintenance and repair tasks, along with infrequent vehicle access. These actions would take place intermittently during the operational life of the pipeline and would generally be limited in scale and confined to specific areas. Potential operational risks would be mainly linked to residual impacts from construction and ongoing maintenance activities.

During decommissioning, most of the pipeline would remain in place which would minimise further disturbance of the land, soils, established vegetation and aquatic habitat. Disturbance associated with the removal of surface infrastructure and sections where cutting, capping and filling would be required, would be localised. Consequently, potential impacts on aquatic ecological values would be short-term and spatially limited.

7.8.2 Environmental values

Surface water

Catchments

The project site would be located within the Channel Country bioregion, and would span two internally draining catchments:

- Cooper Creek catchment – from approximately KP 0 to KP 128 along the pipeline alignment.
- Bulloo drainage basin – from approximately KP 128 to KP 236.2 along the pipeline alignment.

The Cooper Creek and Bulloo drainage basins are the two largest internally draining basins in Australia. Both exhibit similar hydrological characteristics, including:

- ephemeral, braided river and creek networks
- extensive floodplains, wetlands and overflow areas
- highly variable flow regimes driven by irregular summer rainfall.

As both catchments are located in arid to semi-arid regions, surface water is typically absent for extended periods, with flow occurring episodically following significant rainfall (Capon, 2004).

Within Qld, the Cooper Creek catchment covers approximately 243,868 km², accounting for around 14.1% of the total catchment area (DETSI, 2016a). It is dominated by natural palustrine wetlands, principally floodplain swamps that become hydrologically connected during high flow events. Saline lacustrine wetlands are also present, with interactions between surface water and a shallow, saline groundwater system (Cendón et al., 2010).

The Bulloo drainage basin is smaller in extent, covering approximately 52,036 km² in Qld (around 3% of the basin area) (DETSI, 2016b). Similar to Cooper Creek, it is characterised by palustrine wetlands, smaller riverine systems and saline lakes.

Watercourses

Several watercourses and drainage features intersect or occur near the project site:

- The Wilson River, which the pipeline would cross at approximately KP 84, forms part of the Cooper Creek catchment and flows south-west to the Cooper Creek–Wilson River Junction wetland before joining Cooper Creek.
- Cooper Creek continues westward across Qld through a complex network of braided channels and associated wetlands before entering South Australia.
- The Bulloo River lies south-east of the project site and flows south to terminate at the Bulloo Downs Nature Refuge in Qld and the Caryapundy Swamp wetlands in NSW.

Under the Water Act, Cooper Creek, the Wilson River and the Bulloo River are designated watercourses. A number of unnamed tributaries flowing into the Wilson River are also recognised as watercourses. Activities that interfere with or use these watercourses may require authorisation under the Water Act.

In addition to designated watercourses, approximately 305 waterways intersect the broader study area. Of these, five unmapped waterways were assessed as watercourses, 67 unmapped waterways were assessed as drainage features, and four mapped features formed part of existing watercourses and did not require further assessment.

Wetlands

There are no wetlands of international importance (Ramsar wetlands) within the project site. The closest Ramsar site is located approximately 170 km south of the project site.

There are two wetlands listed under the DIWA within 50 km of and outside the project site, as outlined in Table 7.43.

Table 7.43 *Nationally important wetlands within 50km of the project site*

Wetland name	Wetland ID	Distance from project site
Cooper Creek – Wilson River Junction	QLD027	49 km west of the project site.
Bulloo Lake	QLD024	2.4 km east of the project site.

No wetlands of high ecological significance are present within the project site. However, the Bulloo Downs Nature Refuge, located approximately 0.8 km south-east of the project site contains mapped wetland systems (including floodplains, ephemeral creeks and swamps) and intersects the Bulloo Lake nationally important wetland. The Nature Refuge is a protected area under the NC Act.

Additional palustrine (i.e. wetland) habitat was identified during field surveys in the form of gilgai. Gilgai are small natural hollows common on clay floodplains which often hold water after rain, creating temporary habitats (Plate 7.1). Whilst the full extent of gilgai habitat could not be verified during field surveys, wetland habitat mapping on Queensland Globe (Queensland Government, 2025) identifies small patches of natural palustrine wetlands within the project site, as well as broader wetlands in the surrounding areas.



Plate 7.1 *Examples of gilgai (left) and wetlands (Bulloo Lake, right)*

Groundwater

Geology and hydrogeological units

The surface geology within the project site is dominated by Quaternary and Quaternary–Tertiary unconsolidated sediments, including:

- alluvium associated with watercourses and floodplains
- aeolian dune sands (only a small area in the south)
- colluvial gravelly and sandy soils.

These sediments overlie the Tertiary-age Glendower Formation, which comprises sandstone, sandy siltstone, minor conglomerate and mudstone. Beneath this unit lies the Late Cretaceous-age Winton Formation, comprising sandstone, siltstone, mudstone and minor coal. The deeper Great Artesian Basin aquifers underlie the Winton Formation and are hydraulically separated from shallower units by the low-permeability Allaru Mudstone, which acts as an aquitard limiting vertical groundwater movement.

Based on available geological mapping, the shallow hydrogeological units relevant to the project are summarised in Table 7.44.

Table 7.44 Summary of hydrogeological units relevant to the project

Unit	Description	Groundwater characteristics	Formation
Unconsolidated sediments and alluvium	Floodplain and channel deposits, colluvium	Localised, shallow, unconfined and seasonally water-bearing; highly variable permeability	Glendower Formation or on the Winton Formation where the Glendower Formation is not present
Sub-artesian sedimentary aquifers	Sandstone units within Glendower and Winton formations	Confined or semi-confined; groundwater movement through pores and fractures	Glendower formation
Rolling Downs Group aquitard	Fine-grained units	Low permeability; limits vertical hydraulic connectivity	Glendower Formation and Winton Formation
Artesian aquifer of the Great Artesian Basin (Cadna-owie – Hooray)	Sandstone, mudstone and siltstone	Low hydraulic connectivity	Cadna-owie Formation underlain by Hooray Sandstone

Groundwater levels and flows

Groundwater level data from registered bores within a 20 km radius of the project site were used to characterise groundwater elevations. No bore records were available for unconsolidated sediments or alluvium; therefore, shallow groundwater presence was inferred from:

- mapped GDEs
- surface expression GDE areas
- surface expression GDE lines
- proximity to watercourses and riparian vegetation.

Shallow groundwater is expected to occur within a few metres of the ground surface near major watercourses, where groundwater is likely perched on underlying bedrock. Away from these areas, groundwater in unconsolidated sediments is expected to be ephemeral. Recorded depths to groundwater within underlying units are highly variable:

- Glendower Formation – approximately 20–100 m below ground level.
- Winton Formation – approximately 5–80 m below ground level, generally exceeding 10 m.

Regional groundwater flow in shallow sediments was inferred to broadly follow surface topography and drainage patterns. In the sedimentary units, groundwater elevations indicate an overall southerly flow direction, with localised variation near the Wilson River and Bulloo Lake.

Groundwater dependent ecosystems

GDEs are ecosystems that rely on permanent or intermittent access to groundwater (Eamus et al., 2016). Three broad types are recognised: aquatic, terrestrial and subterranean.

There are no confirmed GDEs within the project site. Queensland Globe (Queensland Government, 2025) mapping indicates the potential presence of:

- two terrestrial GDE areas (moderate confidence, not field verified) associated with watercourses intersected by the project site on the underlying Glendower Formation or Winton Formation.
- the nearest mapped potential aquatic GDE is located approximately 46 km west of the project site (moderate confidence) adjacent to the Cooper Creek-Wilson River Junction.

No subterranean GDE areas are mapped within the project site. The nearest mapped springs are located approximately 200 km east of the southern end of the pipeline, and 200 km north-east of the northern end of the proposed pipeline and are attributed to the Cadna-owie Formation underlain by Hooray Sandstone.

Groundwater quality

Groundwater quality in the project site is naturally variable and influenced by source water composition, geology, recharge processes and residence time.

The southern portion of the project site is within the Bulloo River Basin, for which the relevant EVs and water quality objectives (WQOs) are set out in the *Queensland Murray-Darling and Bullo River Basins Groundwater Environmental Values and Water Quality Objectives* (DES, 2020). WQOs for the southern portion of the project site were assessed for the following groundwater zones (other zones have insufficient data):

- Sediments overlying the Great Artesian Basin – Zone 1, Weathered Alluvium
- Upper Great Artesian Basin – Zone 1, Winton Mackunda Western.

For groundwater zones where WQOs have not been established due to limited data, default guideline values were adopted, including:

- ANZG 2018 guidelines (ANZG, 2018) (for aquatic ecosystems, crop irrigation, farm supply/use, stock watering, aquaculture)
- *Australian Drinking Water Guidelines* (NHMRC, 2011), updated November 2018 (for drinking water).

The northern portion of the project site lies within the Cooper Creek Basin, for which groundwater EVs and WQOs have not yet been formally defined. Given the similarity in geology and land use, the Bulloo River Basin EVs have been adopted as a conservative basis for assessment. Based on available data, groundwater in alluvium and unconsolidated sediments is anticipated to be generally fresh to brackish due to seasonal/intermittent recharge of rainfall, run-off and surface water/flood water from infiltration in a low recharge/high evaporation climate. At a regional level the aquatic ecosystem WQOs for the 'Weathered Alluvium' zone within the 'Sediments Overlying the GAB' zone (DES, 2020) indicate predominantly fresh to brackish groundwater (electrical conductivity 20th percentile of 1,316 $\mu\text{S}/\text{cm}$, electrical conductivity 50th percentile of 3,650 $\mu\text{S}/\text{cm}$ and 80th percentile of 24,040 $\mu\text{S}/\text{cm}$), however, there are no published WQOs for the other alluvial zones due to insufficient data.

Groundwater use

Registered bore records indicate groundwater salinity in the Winton Formation is variable, and potable to brackish, with electrical conductivity in the range 3,900 to 10,000 $\mu\text{S}/\text{cm}$ (i.e. brackish). This is within the range of a regional-scale summary of water quality within the Winton Formation, which reports groundwater as variable and ranging from fresh to saline with TDS generally in the range 1,500 to 4,000 mg/L but can be over 20,000 mg/L (DNRME, 2018).

Groundwater salinity in the Glendower Formation is indicated to be brackish, with recorded electrical conductivity values of 5,700 and 6,702 $\mu\text{S}/\text{cm}$. Groundwater in the Cadna-owie Hooray aquifer is indicated to be of brackish quality and anticipated to have low hydraulic connectivity with the overlying alluvium/consolidated sediments.

Registered bores within the 20 km of the project site are recorded in the Queensland Groundwater Database as 'existing' or 'abandoned but useable', with a facility role of 'not described', 'water supply' or 'GAB monitoring'.

In the study area, groundwater is anticipated to be primarily extracted from the sub-artesian rock aquifers (i.e. Glendower Formation and Winton Formation) and the artesian Cadna-owie – Hooray GAB aquifer, separated from the sub-artesian system by the Rolling Downs Group aquitard. Given the ephemeral nature of the watercourses, semi-arid to arid climate and anticipated ephemeral/seasonal presence of groundwater in the alluvial deposits, groundwater extraction from alluvium is expected to be minimal or not to occur.

The primary use of groundwater is likely to be for stock watering given the agricultural land mapping for the area is shown as native pasture/grazing (based on the Queensland Globe, Agricultural land classes), and for stock and domestic use as indicated by water entitlement records. Registered bore records indicate groundwater from the Winton Formation could be extracted for water supply, however these records do not provide detail of what the water supply is used for.

Water entitlement records indicate there are active licences within the search area to take groundwater from the Cadna-owie – Hooray GAB aquifer and Wallumbilla Formation aquifer. Most of the active water licences identified the authorised purpose as 'stock', along with 'domestic supply, stock' and 'irrigation'.

Aquatic ecology

Aquatic habitat

There are no mapped fish habitat areas within the project site.

Aquatic habitat availability within waterways surveyed within, upstream and downstream of the project site was generally limited. Where aquatic habitat was present, it was typically low in quality and extent, comprising small amounts of woody debris, locally varied substrates and sporadic overhanging vegetation. Surface water was largely absent at the time of survey, and aquatic flora and fauna were either absent or present only in a desiccated state.

The limited availability of surface water, combined with sparse aquatic habitat features, indicates that watercourses intersecting the project site are unlikely to provide sustained habitat for aquatic species. Instead, these waterways are expected to function as ephemeral connectivity features, supporting short-term use during high flow and facilitating movement of aquatic species between more persistent refuge habitats such as waterholes and wetlands elsewhere in the landscape.

Across the project site, no major barriers to fauna passage were identified. Localised barriers were limited to existing road crossings, typically unsealed access tracks constructed above the natural channel bed level.

Habitat assessments were undertaken at wetlands, waterholes and waterway sites within the broader survey area, including locations near Bulloo Lake and the Cooper Creek–Wilson River Junction wetlands listed under the DIWA. These features are located outside and downstream of the project site.

In contrast to waterways intersecting the project site, aquatic habitats within the broader region were found to be more diverse and extensive, reflecting their location in areas that retain water on a permanent or semi-permanent basis. These sites supported a greater range of aquatic habitat features, including accumulations of detritus and large woody debris. They also showed lower levels of disturbance from vegetation clearing and cattle grazing, with more stable channel banks and better developed riparian vegetation that provides shading and organic inputs to the aquatic environment.

A total of 82 river condition bioassessments were undertaken during field surveys conducted in July 2025 (post-wet season) and October 2025 (pre-wet season):

- During the post-wet season survey, most sites were classified as being in poor to fair condition, including sites associated with the Bulloo River and the Cooper Creek–Wilson River Junction. These ratings primarily reflected uniform bed substrates, limited or absent surface water, poor bank stability and sparse riparian vegetation. One site (Site 17) was assessed as being in good condition, characterised by a more heterogeneous coarse substrate, limited evidence of erosion or sediment deposition, and the presence of established riparian vegetation.
- During the pre-wet season survey, all assessed sites were classified as poor or fair. Site 17 was downgraded to fair, consistent with reduced water availability and declining bank and vegetation condition.

It is noted that AusRivAS bioassessment tools are not specifically designed for ephemeral waterways typical of western Qld, and resulting condition scores are therefore indicative only. Nonetheless, the results are considered representative of broader conditions across the survey area, where extensive riparian clearing and ongoing cattle access have contributed to generally degraded aquatic habitat condition.

The project site would intersect a total of 182 mapped waterways for waterway barrier works, including:

- ten major risk (purple) waterways
- 63 high risk (red) waterways
- 48 moderate risk (amber) waterways
- 61 low risk (green) waterways.

The number of designations is elevated due to the complex hydrology of the study area, with multiple designations occurring within a single braided river system.

The waterway barrier works risk ratings assist with the determination of accepted development requirements, based on the shape and location of the waterway in the basin, as well as the characteristics of species that reside within them (DPI, 2025). Waterways with a rating of major (purple) or high (red) risk to fish passage generally contain larger biomasses of fish populations and species that are more likely to have weaker swimming abilities, and are generally most at risk of impact from barriers to fish movement (DPI, 2025). Low (green) or moderate (amber) risk waterways for fish passage are often in the upper reaches of a basin with steeper slopes, and would generally have a lower biomass of fish populations than downstream reaches (DPI, 2025).

As formal field verification has not been undertaken by the Department of Primary Industries (DPI), the waterway barrier works designations within the project site should be considered indicative only.

Flora

Desktop assessments and field surveys have not identified any flora species protected under the EPBC Act or the NC Act within the project site.

No pest flora species have been identified in the project site.

Fauna

The closest records of threatened fauna species to the project site (refer to Table 7.45) are several hundred kilometres away, with no potential habitat for these species identified within the project site.

One known noxious fish species, the eastern gambusia (*Gambusia holbrooki*), was recorded a total of 108 times during field surveys. Although no goldfish (*Carassius auratus*) were recorded during field surveys, they are considered likely to occur given previous records in the region (ALA, 2025). Both the eastern gambusia and goldfish are category 3, 5, 6 and 7 restricted matters under the Biosecurity Act and therefore must not be kept, fed, given away, sold or released into the environment.

Table 7.45 Potential presence of listed threatened aquatic fauna species within the project site

Scientific name	Common name	EPBC Act status	NC Act status	Suitable habitat within the project site	Detected during field surveys
<i>Chlamydogobius squamigenus</i>	Edgbaston goby	Vulnerable	Critically endangered	– None.	– Not detected. – Closest record ~540 km north of the project site.
<i>Maccullochella peelii</i>	Murray cod	-	Vulnerable	– None.	– Not detected. – Closest record ~245 km east of the project site.

7.8.3 Potential project impacts

Surface water and groundwater

Table 7.46 summarises the potential water resource related impacts during the construction, operation and decommissioning of the project.

Table 7.46 Potential impacts – surface water and groundwater

Activity	Impact factors	Impact description
Construction		
Stockpiling	Contamination and pollution	Localised degradation of surface water quality due to the loss of stockpile containment.
Storage and handling of hazardous materials	Contamination and pollution	Localised degradation of surface water quality (including hydrocarbon contamination and increased turbidity), accidental spills of contaminants (e.g. fuels, oils).
Clearing and grading	Soil disturbance	Increased run-off velocity, and erosion and sedimentation due to vegetation clearing, topsoil stripping and surface grading.

Activity	Impact factors	Impact description
Water supply	Reduced availability of water	Localised and short-term reduced availability of groundwater at existing receptors from water extraction as described in detail in Appendix A. Drawdown in the order of 0.6 to 2.0 m at 15 km from a pumped bore in the Cadna-owie – Hooray aquifer is estimated for continuous extraction at 5 L/s after 365 days of continuous pumping (conservative extraction regime), and drawdown in the order of 0.1 to 1.1 m is estimated after 90 days of continuous pumping (more likely extraction regime). In both cases, however, it is unlikely that a bore would be pumped continuously and therefore the associated drawdown relative to the water level/piezometric surface before pumping is likely to be less. Estimated distance-drawdown results for extraction from the Winton Formation indicate impact on the groundwater level/piezometric surface in the Winton Formation is expected to be localised and extend less than 500 m from a pumped bore. However, the low extraction rate of 0.25 L/s that needed to be used to simulate drawdown without dewatering the aquifer indicates that the Winton Formation is unlikely to be a suitable source for construction water.
Trenching/trenched crossings	Soil disturbance	Temporary alteration of existing surface drainage patterns and disruption of natural water flow paths due to open-cut trenching and excavation for pipeline installation, including minor watercourse crossings.
		Alteration of shallow groundwater flow pathways (primarily near watercourses) due to dewatering required during trenching.
	Contamination and pollution	Localised degradation of groundwater quality due to accidental spills of contaminants (e.g. fuels, oils).
Trenchless crossings (e.g. HDD)	Soil disturbance; dust	Localised degradation of surface and/or groundwater quality due to ground disturbing works at crossing entry and exit points.
	Contamination and pollution	Temporary impacts to shallow groundwater quality and/or surface waters near the drilling area due to the use of drilling muds to remove cuttings and stabilise the borehole.
Hydrostatic testing	Contamination and pollution	Localised degradation of surface and/or groundwater quality due to short-term discharges of test water.
Operation		
Routine maintenance, repairs and inspections	Soil disturbance	Short term impacts to surface water quality due to short-term increase in erosion and sediment mobilisation where surface disturbance coincides with rainfall, particularly within drainage lines and low lying floodplain areas.
Decommissioning		
Decommissioning of the pipeline	Soil disturbance	Temporary deterioration in surface water quality due to increased erosion and sediment transport to surface waters and wetlands during decommissioning activities.
Removal of surface infrastructure	Hydrological changes	Disturbance to drainage lines and floodplains during removal of surface infrastructure.
	Soil disturbance	Reduced wetland function due to loss of wetland surface conditions and hydrological connectivity caused by the short-term disturbance of surface soils and vegetation at locations where surface infrastructure is removed.

Aquatic ecology

The Aquatic Ecology Assessment provided in Appendix C includes a detailed assessment of potential project impacts on aquatic ecology. As part of this assessment, significant residual impact assessments have been carried out for:

- MSER listed under Qld State Planning Policy 2017, consistent with *Significant Residual Impact Guideline* (DEHP, 2014).

Matters of state environmental significance

A consolidated summary of these significant residual impact assessments is provided in Table 7.47, which confirms that the project is unlikely to have a significant residual impact on any aquatic ecological value of national or state environmental significance.

Table 7.47 Summary of significant impact assessment results (aquatic ecology)

Matter	Significant impact
MNES values	
Wetlands of international significance	
Caryapundy Swamp Ramsar wetland	Unlikely
Threatened fauna species	
Edgbaston goby (<i>Chlamydogobius squamigenus</i>)	Unlikely
MSES values	
Threatened fauna species	
Murray cod (<i>Maccullochella peelii</i>)	Unlikely
Other matters	
Waterways providing for fish passage	Unlikely

The project site would cross 182 waterways that provide for fish passage, and has been located to avoid impacts to permanent flowing waterways and to utilise existing road corridors where possible. The project has been assessed as being unlikely to result in a significant impact on waterways providing for fish passage.

Direct impacts to the Wilson River (major risk waterway) have been further avoided through the use of HDD construction methodology. This approach would avoid significant direct impacts to fish species, habitat and passage within the Wilson River. The design and construction of the project at all other waterway crossings would comply with the accepted development requirements for waterway barrier works, with waterway bed and banks to be reinstated at all waterway crossings post-installation (DPI, 2025).

Potential indirect impacts of the project may include habitat degradation, disturbance, alteration of flow/fauna movement and introduction/spread of introduced species. However, these impacts would be managed through avoidance and standard practice mitigation controls, including the implementation of an ESCP and CEMP.

Summary of aquatic ecological impacts

Table 7.48 summarises the potential land related impacts during the construction, operation and decommissioning of the project.

Table 7.48 Potential impacts – aquatic ecology

Activity	Impact factors	Impact description
Construction		
Vehicle and/or machinery usage and maintenance	Vehicle collision; soil disturbance; vegetation clearing and habitat degradation	Injury or mortality of aquatic fauna due to direct contact, crushing, or disturbance of habitat during construction within or adjacent to waterways.
	Invasive species	Spread of aquatic weeds leading to a reduction in habitat quality for native aquatic species, due to inappropriate wash down of vehicles and/or machinery before entering or exiting site.
Stockpiling	Soil disturbance	Degradation of aquatic habitat due to the mobilisation of sediment from the loss of stockpile containment.
Storage and handling of hazardous materials	Contamination and pollution	Degradation of downstream environments due to accidental spillage of contaminants (e.g. fuels, lubricants) required for the operation of machinery.

Activity	Impact factors	Impact description
Clearing and grading	Vegetation clearing and habitat degradation; soil disturbance	Temporary degradation of aquatic habitat during earthworks within the bed and banks of waterways and the removal of surrounding riparian vegetation.
	Invasive species	Spread of pest fish species through the disturbance and degradation of waterways (including accidental translocation of fish or fish eggs), allowing the pest fish to outcompete and cause localised displacement of native fish.
Trenching/trenched crossings	Vegetation clearing and habitat degradation; soil disturbance	Injury and/or mortality of aquatic fauna during trenching activities, including excavation, dewatering and establishment of coffer dams.
	Light, noise and vibration	Altered species behaviours and disruption to the balance of inter species interactions, due to temporary increases in exposure to light, noise and vibration during construction.
Operation		
Vehicle movement	Dust; soil disturbance; contamination and pollution; air quality and odour	Degradation of water quality due to vehicular movement through the generation of dust, sedimentation and erosion, possible spills of oils and fuels, and particles generated by exhaust.
Routine maintenance, repairs and inspections	Contamination and pollution	Localised degradation of aquatic ecosystem caused by natural gas leakage from pipes.
Facility usage	Contamination and pollution	Degradation of downstream habitat quality and/or potential harm to aquatic fauna due to general waste (e.g. drink bottles and cans, plastic wrappers and/or larger material) generated by personnel on-site entering surrounding waterways.
Routine maintenance, repairs and inspections	Invasive species	Potential to facilitate the introduction and spread of weed species through disturbance of soil, vegetation and ground cover, and through the transfer of weed propagules (e.g. seeds or vegetative material) on vehicles, machinery, equipment and personnel.
Decommissioning		
Decommissioning of the pipeline	Contamination and pollution	Contamination of waterways due to gas leakage or contamination during decommissioning works.

7.8.4 Management practices

Mitigation and management measures that would be applied to minimise the risk of water related impacts during construction, operation and decommissioning of the project are outlined in Table 7.49.

Table 7.49 Mitigation and management measures – water

Impact/issue	Mitigation measure	Timing
Surface water and groundwater		
Flooding impacts	A construction Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP to manage potential impacts to surface water, watercourses, floodplains and groundwater during construction. Construction activities will be planned and sequenced to minimise disturbance to watercourses and floodplains and to avoid high risk hydrological conditions where practicable. Post construction monitoring and corrective actions will be undertaken to confirm reinstatement performance and stability.	Design, pre-construction, construction
	Design and construction planning would continue to be refined to so that the project does not materially affect flood storage capacity, flows or characteristics within and in the vicinity of the project site.	Design, pre-construction
	The CEMP would include flood- and emergency-response measures to manage environmental risks, including protocols to manage flood risks, confirm evacuation routes, facilitate evacuation and support flood recovery.	Pre-construction

Impact/issue	Mitigation measure	Timing
Watercourse crossings	The design of watercourse crossings would continue to be refined to avoid or minimise impacts within and around watercourses as far as practicable, having regard to the identified geomorphic disturbance risk, Riverine Protection Permit Exemption Requirements (Department of Regional Development, Manufacturing and Water, 2023), APGA Code of Environmental Practice Onshore Pipelines (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025) (including Appendix P: Land-based pipeline construction), and Activities in a watercourse, lake or spring associated with a resource activity or mining operations (<i>Water Act 2000</i>).	Design
Construction impacts on water resources, watercourses, water quality and function	The soil and water management plan, which would be prepared and implemented as part of the CEMP to manage potential impacts to surface water, watercourses, floodplains and groundwater during construction, and would include measures to: – manage watercourse crossings – manage any water present during watercourse crossings – manage any accidental spills and leaks of fuels and chemicals – manage drilling muds and fluids required for HDD – manage the application of dust suppression water, including the quality and quantity of water used, and the rate of application – minimise the use of water – dewater any groundwater inflows that may occur during trenching to the same watercourse – manage and prepare for wet weather, including monitoring potential high-risk events (such as storms), inspections of the CRoW after rainfall and corrective actions (as required).	Pre-construction, construction
	The construction SWMP will include: – controls and procedures to manage the process of HDD, including quality of introduced drilling muds and equipment lubricants (i.e. greases), response to pressure loss events or ground movement (such as stopping work, assessment of situation, additional control measures) and disposal of used drilling fluids and drilling cuttings – controls to manage the quality of hydrotest water – measures for managing fuel and chemical handling, storage, distribution and spill response during construction – procedures for regular inspections of storage areas and equipment – procedures/engineering solutions for potential loss of hydrotest water, to minimise losses to ground should leaks occur (e.g. prompt removal of test water should a leak occur). The quality of proposed hydrotest water source(s) will be determined and confirm its suitability for use. Hydrotest water will be managed in accordance with Appendix F (Waste Assessment).	Pre-construction, construction
	Installation of impermeable trench breakers will be installed in high-risk areas (e.g. watercourse crossings, wetlands, terrestrial GDEs and where pipeline trench intersects the water table) to control the movement of groundwater along the pipeline trench. The construction SWMP, which will be prepared and implemented as part of the CEMP, will include measures to: – restrict dewatering to the immediate area of the construction works and minimise extraction volumes – minimise the duration of dewatering activities – collect extracted groundwater for treatment prior to reuse or disposal via irrigation to land.	Pre-construction, construction

Impact/issue	Mitigation measure	Timing
Construction water supply	The preferred water supply option/s for construction will be confirmed prior to construction. Any third-party water sources proposed to be used would be sourced from existing water entitlements within long-term annual extraction limits for the water source. Appropriate testing and hydrogeological assessment will be carried out where new bores are necessary, and appropriate approvals obtained, to satisfy the requirements of the <i>Great Artesian Basin and Other Regional Aquifers water management protocol 2017</i> (State of Queensland, 2019).	Pre-construction, construction
Operation impacts on water resources, watercourses and water quality	The Operational Environmental Management Plan (OEMP) would identify reasonably foreseeable risks relating to water resources and water quality and describe how these risks would be addressed during operations. This would include measures to manage risks associated with the introduction and spread of invasive species and localised degradation of water quality associated with routine maintenance activities and the use of access tracks.	Operation
Decommissioning impacts on water resources, watercourses and water quality	The soil and water management plan prepared and implemented as part of the DEMP would identify reasonably foreseeable risks relating to water resources and water quality and describe how these risks would be addressed during decommissioning.	Decommissioning
Aquatic ecology		
Watercourse crossings	Measures to manage potential impacts on instream habitat and fish passage would be included in the construction soil and water management plan (as part of the CEMP) with reference to the <i>Management and protection of marine plants and other tidal fish habitats</i> (Couchman & Beumer, 2007) and the <i>Accepted development requirements for operational work that is constructing or raising waterway barrier works</i> (DPI, 2025), including: - any large woody debris (i.e. snags) that may be disturbed by watercourse crossings would be temporarily relocated and replaced as close as practicable to the original location and orientation relative to the bank - measures for dewatering and fish salvage at watercourse crossings, if required.	Pre-construction, construction
Riparian vegetation	The design and construction planning of watercourse crossings would continue to be refined to further avoid or minimise impacts on riparian and instream vegetation as far as practicable.	Design, pre-construction, construction
	The rehabilitation strategy would include measures to provide for the rehabilitation (including revegetation where appropriate) of watercourses and riparian areas disturbed during construction.	Pre-construction, construction
Biosecurity	A biosecurity management plan would be prepared and implemented as part of the CEMP, including measures to minimise the potential for biodiversity risks in accordance with the general biosecurity obligation under the Biosecurity Act (Qld).	Pre-construction, construction
	Biosecurity management measures would be incorporated into the OEMP, to minimise the potential for biosecurity risk during maintenance activities in accordance with the general biosecurity obligation under the Biosecurity Act (Qld).	Operation
Operation impacts on aquatic ecology	The OEMP would identify reasonably foreseeable risks relating to aquatic ecology and describe measures to avoid, minimise and manage impacts during operations, including site-specific controls, procedures and responsibilities.	Operation
Decommissioning impacts on aquatic ecology	Implement erosion and sediment control measures during decommissioning works in accordance with the project ESCP, to prevent sediment laden runoff entering surface waters and wetlands.	Decommissioning

7.8.5 Risk assessment

Surface water and groundwater

Table 7.50 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

The scale and linear nature of the project, and the sensitivity of the environments within which it would be located, may result in risks of surface water impacts. Standard erosion and sedimentation control measures, and spill and leak prevention measures, would adequately minimise surface water and groundwater impact risks to negligible or low.

Table 7.50 *Potential risks – surface water and groundwater*

Project phase	Risk	Initial risk	Residual risk
Construction	Stockpiling	Moderate	Low
Construction	Storage and handling of hazardous materials	Moderate	Negligible
Construction	Clearing and grading	Moderate	Low
Construction	Trenching/trenched crossings (soil disturbance – surface water)	Moderate	Low
Construction	Trenching/trenched crossings (soil disturbance – groundwater)	Moderate	Negligible
Construction	Trenching/trenched crossings (contamination and pollution)	Moderate	Negligible
Construction	Trenchless crossings (e.g. HDD) (soil disturbance)	Moderate	Negligible
Construction	Trenchless crossings (e.g. HDD) (contamination and pollution)	Moderate	Negligible
Construction	Hydrostatic testing	Low	Negligible
Construction	Construction water supply (drawdown)	Moderate	Low
Operation	Routine maintenance, repairs and inspections	Moderate	Negligible
Decommissioning	Decommissioning of the pipeline	Low	Negligible
Decommissioning	Removal of surface infrastructure (hydrological changes)	Low	Negligible
Decommissioning	Removal of surface infrastructure (soil disturbance)	Moderate	Low

Aquatic ecology

Table 7.51 summaries the risks of the potential impacts without (initial risk) and with (residual risk) the application of mitigation and management measures. The full risk assessment is provided in Appendix I.

The project would have a relatively low risk of impacting aquatic ecology, based on the limited extent of sensitive aquatic ecological values (noting also that riparian vegetation and ecology is considered separately as terrestrial ecology in Section 7.3). Where impacts may occur, they relate to construction activities across and within permanent or semi-permanent watercourses, particularly in the Channel Country bioregion. Opportunities have been identified to mitigate and manage these impacts, notably through the design of watercourse crossings and a soil and water management plan as part of the project CEMP, to manage risks of these impacts to negligible or low.

Table 7.51 *Potential risks – aquatic ecology*

Project phase	Risk	Initial risk	Residual risk
Construction	Vehicle and/or machinery usage and maintenance (vehicle collision; soil disturbance; vegetation clearing and habitat degradation)	Low	Negligible
Construction	Vehicle and/or machinery usage and maintenance (invasive species)	Moderate	Negligible
Construction	Stockpiling	Moderate	Low
Construction	Storage and handling of hazardous materials	Moderate	Low
Construction	Clearing and grading (vegetation clearing and habitat degradation; soil disturbance)	Moderate	Low
Construction	Clearing and grading (invasive species)	Low	Negligible
Construction	Trenching/trenched crossings (vegetation clearing and habitat degradation; soil disturbance)	Low	Negligible
Construction	Trenching/trenched crossings (light, noise and vibration)	Low	Low
Operation	Vehicle movement	Moderate	Low
Operation	Routine maintenance, repairs and inspections	Low	Negligible
Operation	Facility usage	Low	Negligible
Operation	Routine maintenance, repairs and inspections	Low	Negligible
Decommissioning	Decommissioning of the pipeline	Low	Negligible

8. Mitigation and management practices

8.1 Avoidance and minimisation

To avoid impacts, the pipeline alignment has been refined and its width reduced to the smallest safe working width to minimise the potential environmental impacts. The *Queensland Environmental Offset Policy* (DETSI, 2025i) prescribed under the EO Act and Environmental Offsets Regulation 2014 has been adopted as the project would likely have a significant residual impact on MSES.

The mitigation hierarchy 'avoid, mitigate, offset' applies to the project, and requires impacts to prescribed matters to be reasonably avoided wherever possible. For the residual impacts that cannot be avoided, the extent of the impacts would be mitigated and continually managed to the greatest possible extent. The recommended mitigation and management measures focus on avoidance, minimisation and management of social, cultural and environmental impacts.

8.2 Key residual risks

Despite the adoption of a principle of avoidance and minimisation, and with the application of mitigation measures, some elevated risks of environmental impacts remain during construction of the project. Based on the assessment of potential impacts summarised in Section 7, and the associated risk assessment (refer to Appendix I), only two key residual risks have been identified, as summarised in Table 8.1. Key residual risks have been defined as those evaluated as moderate or greater following the application of proposed mitigation and management measures.

Table 8.1 Key residual risks

Project phase	Risk	Initial risk	Residual risk
Terrestrial ecology			
Construction	Clearing and grading - vegetation clearing and habitat degradation: – Reduction of shelter and foraging opportunities for fauna due to the removal of established habitat and vegetation (including trees, logs, ground cover and other microhabitats). – Localised displacement or mortality of fauna due to disturbance of tree hollows, nests and roost sites.	Moderate	Moderate

8.3 Mitigation and management framework

Environmental impacts associated with construction, operation and decommissioning of the project would be managed through the implementation of environmental management plans prepared in accordance with the conditions of the EA. These plans include a CEMP supported by relevant sub-plans, an OEMP and DEMP. Within this management framework, the consolidated series of mitigation and management measures presented in Table 8.2 would be implemented.

8.4 Offsets

The mitigation hierarchy 'avoid, mitigate, offset' has been applied to the project, and impacts to prescribed matters have been reasonably avoided wherever possible. the project and pipeline alignment in particular has been refined and its width reduced to the smallest safe working width.

For the impacts that cannot be avoided, the extent of the impacts will be mitigated and continually managed to the greatest possible extent.

Due to the avoidance and mitigation measures proposed and the relative abundance and ubiquity of species habitats in the surrounding regional landscape, the project is considered unlikely to have a significant residual impact on all but the following MSES:

- protected wildlife habitat for the plains-wanderer
- regulated vegetation (defined watercourse).

The assessment determined (Table 7.21) that the project is likely to result in a significant residual impact on regulated vegetation (defined watercourse) for which an offset under the EO Act is likely to be required. A potentially significant residual impact is predicted in relation to protected wildlife habitat for plains-wanderer.

MNES are prescribed environmental matters under the EO Act, however, offset conditions for MNES cannot be imposed, delivered or legally secured under the EO Act. The EO Act indicates that the preference is for offset conditions to be imposed by the Commonwealth rather than the State. On this basis any potential offsets determined to be required for impacts to plains-wanderer or its habitat are proposed to be imposed under the EPBC Act.

Table 8.2 Consolidated mitigation and management measures

Impact/issue	Mitigation measure	Timing
General		
Ignition of explosives	In the event that blasting and storage of explosives is required, the following would be specified in the blasting management plan prepared as part of the CEMP, and implemented during construction: – the storage, transport and use of explosives would be conducted in accordance with <i>AS 2187.1:1998 Explosives – Storage, transport and use</i> – the inventory of stored explosives would not exceed the major hazard facility threshold quantities as defined in Schedule 15 of the Work Health and Safety Regulation 2011.	Pre-construction, construction
Loss of containment of diesel	The transport, handling and storage of diesel would be undertaken in accordance with relevant Australian Standards, codes and guidelines, including: – <i>Australian Code for the Transport of Dangerous Goods by Road and Rail</i> (NTC, 2024) – <i>AS 1940:2017 The storage and handling of flammable and combustible liquids</i>.	Construction, operation, decommissioning
Management of hazards and risks during operation	A pipeline management system would be implemented in accordance with the AS 2885 and the <i>Petroleum and Gas (Production and Safety) Act 2004</i> , including processes for managing any emergency events during operation and maintenance, and from external events that may affect the safe and reliable operation of the pipeline system.	Operation
Management of hazards and risks during decommissioning	Measures to manage potential hazards and risks during decommissioning would be identified in the safety management study in accordance with <i>AS 2885.6:2018 Pipelines – Gas and liquid petroleum, Part 6: Pipeline safety management</i>. These measures would be incorporated into the abandonment plan and DEMP, consistent with relevant regulatory and best practice requirements in effect at the time. The DEMP would identify reasonably foreseeable risks to EVs, including soil and water resources, terrestrial and aquatic ecology, and describe measures to avoid, minimise and manage impacts during decommissioning. Measures would include site-specific controls and responsibilities and would comply with relevant regulatory and best-practice requirements in effect at the time.	Decommissioning
Soils and geology		
Soil disturbance and erosion	A soil and water management plan would be prepared and implemented as part of the CEMP. The plan would identify reasonably foreseeable risks relating to soil erosion, soil and water quality impacts, including from any contamination, and describe how these risks would be addressed during construction. The plan would be prepared with reference to relevant guidelines, in particular the APGA Code of Environmental Practice (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025). The plan would detail management measures to be implemented, including in relation to: – areas of higher erosion hazard, saline or sodic soils, including the requirement to prepare site and activity-specific erosion and sediment controls – managing topsoil and subsoil stockpiles – managing any unidentified contamination in accordance with an unexpected contaminated finds procedure – managing any accidental spills or leaks of fuels and chemicals – managing the application of dust suppression water, including the quality and quantity of water used, and the rate of application	Pre-construction, construction

Impact/issue	Mitigation measure	Timing
	– arrangements for managing wet weather, including monitoring potential high-risk events (such as storms) and specific controls to be applied to dispersive soils and follow-up measures – the process for progressively stabilising disturbed areas in accordance with the rehabilitation strategy.	
	Site and activity-specific ESCP/s would be prepared and include erosion and sediment controls appropriate for site-specific soil types, locations and activities, including the use of soil ameliorants (e.g. gypsum) or polymers as required. The ESCP/s would be prepared with reference to the APGA Code of Environmental Practice (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025).	Construction
Contamination of soils	Storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with <i>AS 1940:2017 – The storage and handling of flammable and combustible liquids</i> .	Construction, operation
Wastewater management	The wastewater treatment systems and effluent irrigation areas at the temporary accommodation facilities would be designed, installed, operated and maintained in accordance with <i>AS 1547:2012 On-site domestic wastewater management</i> .	Construction, decommissioning
Decommissioning impacts on soil and land	A soil and water management plan would be included in the DEMP and implemented during decommissioning to minimise potential impacts on soils and water quality. The plan would include measures for erosion control, management of any contaminated areas and stabilisation of disturbed areas.	Decommissioning
Land use and tenure		
Impacts on land use and property	Design and construction planning would continue to be refined to manage potential impacts on land uses and properties in consultation with landholders.	Design, pre-construction
	Construction property management plans would be prepared in consultation with landholders affected by the pipeline easement. The plans would include: – measures to reduce property impacts, including impacts on agricultural operations, as far as practicable – measures to provide assurance that disruption to farm operations, including the movement of livestock and farm machinery, is as agreed with individual landholders – details of any required adjustments to and/or replacement of affected farm infrastructure, such as farm dams, livestock handling yards, fencing, silos, holding pens and sheds – biosecurity and rehabilitation measures to be implemented on individual properties.	Design, construction
Rehabilitation of construction areas	A rehabilitation strategy would be prepared to guide rehabilitation planning, implementation, monitoring and maintenance of disturbed areas (not occupied by permanent project infrastructure) following the completion of construction. The strategy would: – identify rehabilitation objectives, criteria and requirements in accordance with the APGA Code of Environmental Practice (APGA, 2022) – establish roles and responsibilities – define rehabilitation actions and requirements – define monitoring and maintenance requirements – describe adaptive management approaches if monitoring identifies a need – require consultation with landholders on rehabilitation requirements.	Pre-construction, construction

Impact/issue	Mitigation measure	Timing
Terrestrial ecology		
Vegetation clearing/habitat degradation	Design and construction planning would continue to be refined to further avoid or minimise impacts on native vegetation and fauna habitat as far as practicable.	Design, pre-construction
	Pre-clearing surveys would be undertaken prior to construction within sensitive areas, defined as follows: – vegetated land – areas of riparian vegetation – areas identified by the project ecologist as supporting known or potential habitat, for ground-dwelling and arboreal species. Limit disturbance to the CRoW, extra work spaces and approved access tracks. During pre-clearing surveys, trees in the disturbance footprint with hollows would be marked and avoided where practicable. Tree hollows in hollow-bearing trees within areas to be cleared would be assessed by the ecologist for suitability for salvage and relocation. Fauna detected during surveys would be relocated in accordance with the appropriate animal ethics and legislative permits. Use HDD at the Wilsons River crossing to avoid direct impacts to high-value habitats (e.g., HBTs, potential breeding places for conservation significant species, etc.). Locate storage areas (e.g., stockpiling areas, laydowns) and access tracks/ passing locations outside of vegetated areas where possible, to minimise vegetation removal required Clearly define approved clearing extents using detailed spatial mapping, with vegetation clearing constrained through marking of the CRoW boundary using highly visible pegs or markers. Physical demarcation (e.g. flagging) would be applied locally where required at sensitive environmental features or exclusion zones. GPS-enabled machinery post physical marking of the CRoW boundary and geofenced construction boundaries. Clearing to proceed sequentially to allow fauna to disperse into adjacent habitat. Respreading of topsoil and ripping to occur as soon as practicable following trench backfilling, including spreading of vegetation and large woody debris where feasible Reinstate landform, contours and drainage to a stable condition as soon as practicable following completion of works. Permit natural regrowth of temporary disturbance areas as soon as practicable. Storage and handling of dangerous and hazardous materials (e.g. fuel, oil and other chemicals) would be undertaken in accordance with AS 1940:2017 – <i>The storage and handling of flammable and combustible liquids</i>.	Pre-construction, construction
Fauna injury and mortality	Install fauna ramps every 500 m and fauna refuge bags every 100–200 m, and undertake daily inspections of trenches. Any fauna handling must be conducted under the relevant permits. Where required, high-risk and low-risk SMPs would be prepared for threatened species, in accordance with the NC Act. Prepare and implement incident response procedures for any wildlife injury or mortality during construction. Implement trench management measures including daily inspections of trenches.	Pre-construction, construction
Construction impacts on terrestrial ecology	Biodiversity offsets would be finalised in accordance with the EO Act and the <i>EPBC Act Environmental Offsets Policy</i> (DSEWPC, 2012).	Design

Impact/issue	Mitigation measure	Timing
Biosecurity	A biosecurity management plan would be prepared and implemented as part of the CEMP, including measures to minimise the potential for biodiversity risks in accordance with the general biosecurity obligation under the Biosecurity Act (Qld). Undertake active feral pest monitoring during construction, particularly for feral cats via deployment of active controls such as Felixer grooming traps at locations along the pipeline alignment where cat faeces have been observed. Record sightings/evidence of pest animals during construction. Prohibit construction staff from bringing domestic animals on site.	Pre-construction, construction
Hydrological changes	Develop and implement a site-specific ESCP in accordance with IECA standards (IECA, 2008), including the protection of sensitive habitats using erosion and sediment controls, and the management of dispersive soils. Place stripped soils outside waterways and stabilise using erosion controls. Undertake bed and bank stabilisation as soon as practicable post completion of works once subsurface is achieved. Design crossings to maintain floodplain connectivity and natural hydrology. Incorporate flood/storm contingency procedures to protect EVs during severe weather.	Pre-construction, construction
Disturbance of fauna from increased dust, light, noise and vibration	Use water carts to manage dust generation on the CRoW and access tracks. Direct lighting away from sensitive habitats where possible. Where appropriate, use broadband reversing alarms instead of tonal beepers. Minimise night works and artificial light to safety requirements to reduce spill into adjacent bushland. Maintain equipment to keep noise within acceptable limits, with regular monitoring of dust and noise. Stabilise disturbed areas promptly following completion of works. Limit construction works to daylight hours wherever feasible to reduce light and noise impacts to nocturnal fauna.	Construction
Air quality		
Construction air quality	Air quality management measures would be included in the CEMP and implemented during construction. The CEMP would detail processes, responsibilities and measures to manage air quality and minimise the potential for impacts during construction. The CEMP would include, but not be limited to: – a map identifying locations of sensitive receptors – potential sources of emissions to air – air quality management objectives consistent with the Environmental Protection (Air) Policy 2019 – management measures to be implemented, including preferred methods for dust suppression and triggers for implementation – a process for monitoring dust on site and weather conditions.	Pre-construction, construction
Vehicle movements	Measures to minimise dust emissions associated with vehicle movements on unsealed roads during construction of the project would be included in the CEMP and implemented where dust from project-related traffic movements has the potential to impact sensitive receptors (including those within 250 m of unsealed access tracks and roads).	Construction Operation
Decommissioning air quality	Measures to minimise dust emissions associated with vehicle movements on unsealed roads during operation of the project would be consistent with those applied during construction.	Decommissioning

Impact/issue	Mitigation measure	Timing
Noise		
Construction noise and vibration	A noise and vibration management plan would be prepared and implemented as part of the CEMP. The plan would identify: – potentially high noise and vibration generating activities associated with construction – measures to manage identified impacts – arrangements for consultation with potentially affected sensitive receptors, including notification and complaint handling procedures – an out-of-hours work protocol to define the process for considering, approving and managing out of hours work. The protocol would include implementing feasible and reasonable measures and communication requirements.	Pre-construction, construction
Blasting	The need for blasting would be confirmed during detailed construction planning. In the event that blasting is required, the blast parameters would be designed, and allowable charge mass confirmed, to achieve the airblast overpressure and ground vibration requirements of the <i>Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration</i> (ANZEC, 1990). This would include trial blasting and airblast/vibration monitoring to confirm site-specific constraints and refine safe blasting distances.	Pre-construction
Decommissioning of the pipeline	A noise and vibration subplan will be included in the decommissioning environmental management plan and implemented during decommissioning to minimise the potential for impacts on sensitive receptors. Measures will include, but not be limited to: – scheduling noisier activities during standard hours where feasible – arrangements for consultation with affected sensitive receptors, including notification and complaint handling procedures – measures to manage potential noise impacts.	Decommissioning
Community (traffic)		
Construction impacts on roads and transport network	A traffic management plan would be prepared and implemented as part of the CEMP. The plan would detail measures to minimise potential traffic, transport and access impacts during construction, including measures to maintain the safe and efficient operation of roads and transport infrastructure. Appropriate traffic control measures would be adopted to manage road user safety, such that it is not impacted by construction-related vehicles travelling to and from the project site. The plan would include a driver's code of conduct for haulage operations to define appropriate driver behaviour and safety requirements for drivers operating heavy vehicles on public roads. The plan would be prepared in consultation with relevant stakeholders, including TMR and Bulloo Shire Council.	Pre-construction, construction
Local roads and private property access	Condition surveys of local roads and access tracks proposed to be used or affected during construction would be completed prior to and following construction and provided to the relevant road authority.	Pre-construction, construction
OSOM vehicles	The construction contractor would confirm the dimensions and proposed routing of OSOM vehicles to be used and apply for the necessary permits prior to undertaking OSOM movements. The assessment would consider the shortest and least trafficked route for OSOM vehicles to minimise the risk to other motorists.	Pre-construction, construction
Decommissioning impacts on roads, transport and access	A traffic management plan would be included in the DEMP and implemented during decommissioning to manage potential impacts on traffic, transport and access. The plan would include, but not be limited to: – appropriate traffic control measures – driver's code of conduct for haulage operation – consultation with relevant stakeholders, including landholders and Bulloo Shire Council.	Decommissioning

Impact/issue	Mitigation measure	Timing
Heritage		
Unintentional damage or destruction to unexpected heritage finds and human remains	An unexpected finds and human skeletal remains procedure would be developed and included in the cultural heritage management plan to provide a consistent method for managing any unexpected Aboriginal or non-Aboriginal heritage items or human skeletal remains.	Pre-construction, construction
Waste		
Construction waste management	Measures to manage waste would be included in the CEMP and implemented during construction. The measures would adopt circular economy principles and the waste hierarchy contained in the <i>Waste Reduction and Recycling Act 2011</i> . The measures would detail processes, responsibilities and actions to manage waste and minimise the potential for impacts during construction.	Pre-construction, construction
Waste classification and management	All waste would be classified and managed in accordance with the EP Act and the EP Regulation (or any relevant resource recovery orders and exemptions). This includes the handling and disposal of regulated and/or hazardous waste by appropriately qualified and licenced contractors.	Construction, operation, decommissioning
Decommissioning waste management	Measures to manage waste would be included in the DEMP and implemented during decommissioning. The measures would detail processes, responsibilities and actions to manage waste and minimise the potential for impacts during decommissioning in accordance with relevant statutory requirements and waste guidelines.	Decommissioning
Surface water and groundwater		
Flooding impacts	A construction Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP to manage potential impacts to surface water, watercourses, floodplains and groundwater during construction. Construction activities will be planned and sequenced to minimise disturbance to watercourses and floodplains and to avoid high risk hydrological conditions where practicable. Post construction monitoring and corrective actions will be undertaken to confirm reinstatement performance and stability.	Design, pre-construction, construction
	Design and construction planning would continue to be refined to so that the project does not materially affect flood storage capacity, flows or characteristics within and in the vicinity of the project site.	Design, pre-construction
	The CEMP would include flood- and emergency-response measures to manage environmental risks, including protocols to manage flood risks, confirm evacuation routes, facilitate evacuation and support flood recovery.	Pre-construction
Watercourse crossings	The design of watercourse crossings would continue to be refined to avoid or minimise impacts within and around watercourses as far as practicable, having regard to the identified geomorphic disturbance risk, Riverine Protection Permit Exemption Requirements (Department of Regional Development, Manufacturing and Water, 2023), APGA Code of Environmental Practice Onshore Pipelines (APGA, 2022) and the <i>Best Practice Erosion and Sediment Control Guidelines</i> (IECA, 2025) (including Appendix P: Land-based pipeline construction), and Activities in a watercourse, lake or spring associated with a resource activity or mining operations (Water Act 2000). Crossing specific controls will be implemented through the SWMP to maintain existing drainage lines and overland flow paths, manage temporary works, reinstate micro topography and channel form, and monitor post rainfall performance.	Design, construction

Impact/issue	Mitigation measure	Timing
Construction impacts on water resources, watercourses, water quality and function	The soil and water management plan, which would be prepared and implemented as part of the CEMP to manage potential impacts to surface water, watercourses, floodplains and groundwater during construction, and would include measures to: – manage watercourse crossings – manage any water present during watercourse crossings – manage any accidental spills and leaks of fuels and chemicals – manage drilling muds and fluids required for HDD – manage the application of dust suppression water, including the quality and quantity of water used, and the rate of application – minimise the use of water – dewater any groundwater inflows that may occur during trenching to the same watercourse – manage and prepare for wet weather, including monitoring potential high-risk events (such as storms), inspections of the CRoW after rainfall and corrective actions (as required).	Pre-construction, construction
	The construction SWMP will include: – controls and procedures to manage the process of HDD, including quality of introduced drilling muds and equipment lubricants (i.e. greases), response to pressure loss events or ground movement (such as stopping work, assessment of situation, additional control measures) and disposal of used drilling fluids and drilling cuttings – controls to manage the quality of hydrotest water – measures for managing fuel and chemical handling, storage, distribution and spill response during construction – procedures for regular inspections of storage areas and equipment – procedures/engineering solutions for potential loss of hydrotest water, to minimise losses to ground should leaks occur (e.g. prompt removal of test water should a leak occur). The quality of proposed hydrotest water source(s) will be determined and confirm its suitability for use. Hydrotest water will be managed in accordance with Appendix F (Waste Assessment).	Pre-construction, construction
	Installation of impermeable trench breakers will be installed in high-risk areas (e.g. watercourse crossings, wetlands, terrestrial GDEs and where pipeline trench intersects the water table) to control the movement of groundwater along the pipeline trench. The construction SWMP, which will be prepared and implemented as part of the CEMP, will include measures to: – restrict dewatering to the immediate area of the construction works and minimise extraction volumes – minimise the duration of dewatering activities – collect extracted groundwater for treatment prior to reuse or disposal via irrigation to land.	Pre-construction, construction
Construction water supply	The preferred water supply option/s for construction will be confirmed prior to construction. Any third-party water sources proposed to be used would be sourced from existing water entitlements within long-term annual extraction limits for the water source. Appropriate testing and hydrogeological assessment will be carried out where necessary, and appropriate approvals obtained, to satisfy the requirements of the Great Artesian Basin and Other Regional Aquifers water management protocol 2017 (State of Queensland, 2019).	Pre-construction

Impact/issue	Mitigation measure	Timing
Operation impacts on water resources, watercourses and water quality	The OEMP would identify reasonably foreseeable risks relating to water resources and water quality and describe how these risks would be addressed during operations. This would include measures to manage risks associated with the introduction and spread of invasive species and localised degradation of water quality associated with routine maintenance activities and the use of access tracks.	Operation
Decommissioning impacts on water resources, watercourses and water quality	The soil and water management plan prepared and implemented as part of the DEMP would identify reasonably foreseeable risks relating to water resources and water quality and describe how these risks would be addressed during decommissioning.	Decommissioning
Aquatic ecology		
Watercourse crossings	Measures to manage potential impacts on instream habitat and fish passage would be included in the construction soil and water management plan (as part of the CEMP) with reference to the <i>Management and protection of marine plants and other tidal fish habitats</i> (Couchman & Beumer, 2007) and the <i>Accepted development requirements for operational work that is constructing or raising waterway barrier works</i> (DPI, 2025), including: any large woody debris (i.e. snags) that may be disturbed by watercourse crossings would be temporarily relocated and replaced as close as practicable to the original location and orientation relative to the bank measures for dewatering and fish salvage at watercourse crossings, if required.	Pre-construction, construction
Riparian vegetation	Confirm that the following waterway crossing methods are adopted: - special crossing methods for higher risk waterways - HDD for Wilson River. Develop a reinstatement plan for high risk (red) waterways, prioritising engineered bed and bank stabilisation measures to ensure long term channel stability post installation. All waterway crossing structures are to consider the suite of fish present in the waterway and the fish species' passage requirements.	Design, pre-construction, construction
	The design and construction planning of watercourse crossings would continue to be refined to further avoid or minimise impacts on riparian and instream vegetation as far as practicable.	Design, pre-construction, construction
	The rehabilitation strategy would include measures to provide for the rehabilitation (including revegetation where appropriate) of watercourses and riparian areas disturbed during construction.	Pre-construction, construction
Biosecurity	A biosecurity management plan would be prepared and implemented as part of the CEMP, including measures to minimise the potential for biodiversity risks in accordance with the general biosecurity obligation under the Biosecurity Act (Qld).	Pre-construction, construction
	Biosecurity management measures would be incorporated into the OEMP, to minimise the potential for biosecurity risk during maintenance activities in accordance with the general biosecurity obligation under the Biosecurity Act (Qld).	Operation
Operation impacts on aquatic ecology	The OEMP would identify reasonably foreseeable risks relating to aquatic ecology and describe measures to avoid, minimise and manage impacts during operations, including site-specific controls, procedures and responsibilities.	Operation
Decommissioning impacts on aquatic ecology	Implement erosion and sediment control measures during decommissioning works in accordance with the project ESCP, to prevent sediment laden runoff entering surface waters and wetlands.	Decommissioning

9. References

- Atlas of Living Australia (ALA). (2025). *Spatial analysis (Spatial Portal)*. <https://www.ala.org.au/>
- Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ). (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. <https://www.waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000>
- Australian and New Zealand Governments (ANZG). (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments. Canberra, ACT: Australia. <https://www.waterquality.gov.au/anz-guidelines>
- Australian and New Zealand Environmental Council (ANZEC). (1990). Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration. <https://www.nepc.gov.au/sites/default/files/2022-09/anzec-gl-technical-basis-guidelines-minimise-annoyance-due-blasting-overpressure-and-ground.pdf>
- Australian Pipelines and Gas Association (APGA). (2022). *Code of Environmental Practice – Onshore Pipelines*. Revision 5, April 2022. https://apga.org.au/hubfs/apga_code_of_environmental_practice_2022.pdf?hsLang=en
- Australian Virtual Herbarium (AVH). (2025). *Search for records in The Australian Virtual Herbarium*. https://avh.ala.org.au/search#tab_simpleSearch
- Bureau of Meteorology (BoM). (2025). *Groundwater Dependent Ecosystems Atlas*. Australian Government. <http://www.bom.gov.au/water/groundwater/gde/>
- Bureau of Meteorology (BoM). (2026). *Climate Data Online*. Australian Government. <https://www.bom.gov.au/climate/data/index.shtml#mapoption>
- Bulloo Shire Council. (2019). *Bulloo Shire Planning Scheme*. https://www.bulloo.qld.gov.au/files/assets/public/v/1/planning-development/documents/adopted_planning_scheme_2019.pdf
- Bulloo Shire Council. (2022). *Bulloo Shire Council Biosecurity Plan 2022 onwards*. https://www.bulloo.qld.gov.au/files/assets/public/v/1/council-services/documents/bulloo_shire_council_biosecurity_plan_2022_onwards_adopted_25102022.pdf
- Capon, S.J. (2004). *Flow variability and vegetation dynamics in a large arid floodplain: Cooper Creek, Australia* [doctoral thesis]. Griffith University. <https://research-repository.griffith.edu.au/items/ee66e419-f19d-5a83-afc0-42c2b91a92a0>
- Cendón, D.I., Larsen, J.R., Jones, B.G., Nanson, G.C., Rickleman, D., Hankin, S.I., Pueyo, J.J. & Maroulis, J. (2010). Freshwater recharge into a shallow saline groundwater system, Cooper Creek floodplain, Queensland, Australia. *Journal of Hydrology*, 392(3–4), 150–163.
- Couchman, D. & Beumer, J. (2007). *Management and protection of marine plants and other tidal fish habitats*. Queensland Department of Primary Industries and Fisheries, Fish Habitat Management Operational Policy FHMOP 001. https://www.dpi.qld.gov.au/_data/assets/pdf_file/0010/56359/FHMOP001-Fish-Hab-Manage.pdf
- Dear, S.E., Williams, K.M., McElnea, A.E., Ahern, C.R., Dobos, S.K., Moore, N.G. & O'Brien, L.E. (2024). *Queensland Acid Sulfate Soil Technical Manual*. Soil Management Guidelines, Version 5.1. Department of Resources and Department of Environment, Science and Innovation, Queensland. https://www.publications.qld.gov.au/dataset/cf17fb49-0ea5-4dee-82c9-32e09bf1eab5/resource/6d880993-4b80-45e3-9110-5c24fa7a7e75/download/soil-management-guidelines-version-5.1_1nov-2024_final.pdf
- Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP). (2004). *Aboriginal Cultural Heritage Act 2003 Duty of Care Guidelines*. Queensland Government. https://www.qld.gov.au/_data/assets/word_doc/0031/175198/duty-of-care-guidelines-2025.docx
- Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2025a). *Protected Matters Search Tool*. <https://pmst.environment.gov.au/>

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2025b). *Species Profile and Threats Database*. <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2025c). *Directory of Important Wetlands in Australia*. <https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>

Department of Environment and Heritage Protection (DEHP). (2014). *Queensland Environmental Offsets Policy: Significant Residual Impact Guideline*. https://environment.des.qld.gov.au/_data/assets/pdf_file/0017/90404/significant-residual-impact-guide.pdf

Department of Environment and Science (DES). (2020). *Environmental Protection (Water and Wetland Biodiversity) Policy 2019, Queensland Murray-Darling and Bulloo River Basins, Groundwater Environmental Values and Water Quality Objectives*. https://environment.des.qld.gov.au/_data/assets/pdf_file/0019/214228/Qld-Murray-Darling-basin-Bulloo-River-basin.pdf

Department of Environment, Science and Innovation (DESI). (2024). *Application requirements for petroleum activities guideline*. ESR/2016/2357, Version 4.01. https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-gl-application-requirements.pdf

Department of Infrastructure, Local Government and Planning (DILGP). (2017). *State Planning Policy*. <https://dsdmipprd.blob.core.windows.net/general/spp-july-2017.pdf>

Department of Local Government, Water and Volunteers (DLGWV). (2026). *Queensland Government Open Data Portal*. <https://www.data.qld.gov.au>

Department of Primary Industries (DPI). (2025). *Accepted development requirements for operational work that is constructing or raising waterway barrier works*. <https://www.publications.qld.gov.au/dataset/b1259f08-152a-439e-ab6a-0ed30bab6412/resource/011a916e-30ad-4f52-87e9-f9c5a6b2532f/download/requirements-waterway-barrier-works-accepted-development.pdf>

Department of Regional Development, Manufacturing and Water. (2023). Riverine protection exemption requirements. Queensland Government. rdmw.qld.gov.au

Department of Sustainability, Environment, Water, Population and Communities (DSEWPC). (2012). *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. https://www.dcceew.gov.au/sites/default/files/documents/offsets-policy_2.pdf

Department of the Environment (DoE). (2013). *Significant impact guidelines 1.1: Matters of national environmental significance*. https://www.dcceew.gov.au/sites/default/files/documents/nes-guidelines_1.pdf

Department of the Environment, Tourism, Science and Innovation (DETSI). (2016a). *Cooper Creek drainage basin — facts and maps*. <https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/basin-cooper-creek/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2016b). *Bulloo drainage basin — facts and maps*. <https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/basin-bulloo/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2019). *WetlandMaps – Interactive maps and wetlands data in Queensland*. <https://wetlandinfo.detsi.qld.gov.au/wetlands/facts-maps/get-mapping-help/wetland-maps/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025a). *Application requirements for activities with impacts to land*. ESR/2015/1839, Version 4.07. https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-land-impacts.pdf

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025b). *WildNet platform*. <https://wildnet.science-data.qld.gov.au/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025c). *Biomaps*. <https://apps.information.qld.gov.au/Storymaps/Biomaps/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025d). *MSES environmental database and report tool*. <https://www.qld.gov.au/environment/management/environmental/environmental-reports-online>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025e). *WetlandInfo*. <https://wetlandinfo.detsi.qld.gov.au/wetlands/>

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025f). *Application requirements for activities with impacts to air*. ESR/2015/1840, Version 5.05. https://www.des.qld.gov.au/policies?a=272936:policy_registry/era-gl-air-impacts.pdf

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025g). *Prescribing noise conditions for environmental authorities for petroleum activities*. ESR/2016/1935, Version 2.06. https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-gl-noise-assessment-prescribing-conditions.pdf

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025h). *Manual for assessing consequence categories and hydraulic performance of structures*. ESR/2016/1933, Version 5.05. https://www.detsi.qld.gov.au/policies?a=272936:policy_registry/era-mn-assessing-consequence-hydraulic-performance.pdf

Department of the Environment, Tourism, Science and Innovation (DETSI). (2025i). *Queensland Environmental Offsets Policy*. EPP/2015/1658, Version 1.17. https://www.detsi.qld.gov.au/policies?a=272936:policy_registry/envoff-offsets-policy.pdf

Department of Transport and Main Roads (TMR). (2023). *Transport Noise Management Code of Practice: Volume 2 – Construction Noise and Vibration*. https://www.des.qld.gov.au/policies?a=272936:policy_registry/pr-cp-noise-and-vibration.pdf

Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism (DWATSIPM). *Aboriginal and Torres Strait Islander Cultural Heritage Database and Register*. <https://www.culturalheritage.qld.gov.au/achris/public/>

Eamus, D., Fu, B., Springer, A.E. & Stevens, L.E. (2016). Groundwater dependent ecosystems: Classification, identification techniques and threats, in Jakeman, A.J., Barreteau, O., Hunt, R.J., Rinaudo, J.D. & Ross, A. (eds) *Integrated Groundwater Management*. Springer, Cham.

Geoscience Australia. (2026). *Digital Earth Australia Land Cover*. Digital Earth Australia Maps. <https://maps.dea.ga.gov.au/story/DEALandCover>

Institute of Air Quality Management (IAQM). (2024). *Guidance on the assessment of dust from demolition and construction*. Version 2.2. <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>

International Erosion Control Association (IECA). (2025). *Best Practice Erosion and Sediment Control*. <https://connect.ieca.org/austieca/resources/resources-list/bpesc-document>

National Health and Medical Research Council (NHMRC). (2011). *Australian Drinking Water Guidelines*. Paper 6 National Water Quality Management Strategy. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra. <https://www.nhmrc.gov.au/about-us/publications/australian-drinking-water-guidelines>

National Transport Commission (NTC). (2024). *Australian Code for the Transport of Dangerous Goods by Road & Rail*. Edition 7.9. Commonwealth of Australia. <https://www.ntc.gov.au/sites/default/files/assets/files/Australian%20Code%20for%20the%20Transport%20of%20Dangerous%20Goods%20by%20Road%20%26%20Rail%20-%20Edition%207.9%20%28Volume%20I%20%26%20II%29.pdf>

Queensland Government. (2019). *Acid sulfate soils explained*. <https://www.qld.gov.au/environment/land/management/soil/acid-sulfate/explained>

Queensland Government. (2025). *Queensland Globe*. <https://qldglobe.information.qld.gov.au/>

Queensland Government. (2026). *Water Monitoring Information Portal*. <https://water-monitoring.information.qld.gov.au/>

Standards Australia. (2022). *AS 2885 Pipelines – Gas and Liquid Petroleum series of standards*. <https://store.standards.org.au/product/as-2885-0-2018>

State of Queensland. 2019. Great Artesian Basin and Other Regional Aquifers water management protocol 2017, amended December 2019 (Revision 1).

Sullivan, L., Ward, N., Toppler, N. & Lancaster, G. (2018a). *National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual*. Department of Agriculture and Water Resources, Canberra. <https://www.waterquality.gov.au/sites/default/files/documents/sampling-identification-methods.pdf>

Sullivan, L., Ward, N., Toppler, N. & Lancaster, G. (2018b). *National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual*. Department of Agriculture and Water Resources, Canberra. <https://www.waterquality.gov.au/sites/default/files/documents/identification-laboratory-methods.pdf>

