Gladstone Area Water Board

East End Pipeline Project

Planning Report for Material Change of Use within the GSDA – Alignment optimisation

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Gladstone Area Water Board

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Abbreviations

Abbreviation	Definition
AHD	Australian Height Datum
ASRIS	Australian Soil Resource Information System
ASS	Acid sulfate soils
BCPS	Boat Creek Pump Station
BGGTP	Bailai, Gurang, Gooreng Gooreng, Taribelang Bunda People
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CMD	Coastal management district
CPESC	Certified Professional in Erosion and Sediment Control
CWQIP	Central and Western Queensland Infrastructure Plan
DAF	Department of Agriculture and Fisheries
DATSIP	Department of Aboriginal and Torres Strait Islander Partnerships
DESI	Department of Environment, Science and Infrastructure
DICL	Ductile Iron Cement Lined
DoR	Department of Resources
DSDI	Department of State Development and Infrastructure
EA	Environmental Authority
EDQ	Economic Development Queensland
EE TW pipeline	East End Treated Water pipeline
EER	East End Reservoir
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERA	Environmental Relevant Authority
ESCP	Erosion and Sediment Control Plan
FGP	Fitzroy to Gladstone Pipeline
GAWB	Gladstone Area Water Board
GFP	Gladstone to Fitzroy Pipeline
GSDA	Gladstone State Development Area
Ha	Hectares
HR	High risk
Km	Kilometres
Lat	Latitude
LGA	Local Government Areas
Long	Longitude
LR	Low risk
LR	Landing Road
m	Metres
MCU	Material Change of Use
ML	Megalitres
mm	Millimetres
MNES	Matters of National Environmental Significance
MP	Member of parliament

Abbreviation	Definition
MSCL	Mild steel cement lined
MSES	Matters of State Environmental Significance
OCG	Office of the Coordinator-General
OEMP	Operational Environmental Management Plan
PESCP	Progressive Erosion and Sediment Control Plan
Planning Act	*Planning Act 2016*
PMST	Protected Matters Search Tool
Qld	Queensland
RE	Regional ecosystem
RNTBC	First Nations Bailai Gurang Gooreng Gooreng Taribelang Bunda People Aboriginal Corporation
ROW	Right of Way
RV	Regulated vegetation
SDA	State Development Area
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SMP	Species Management Plan
SPP	*State Planning Policy 2017*
TEC	Threatened ecological community
TMR	Department of Transport and Main Roads
TW	Treated water

1. INTRODUCTION

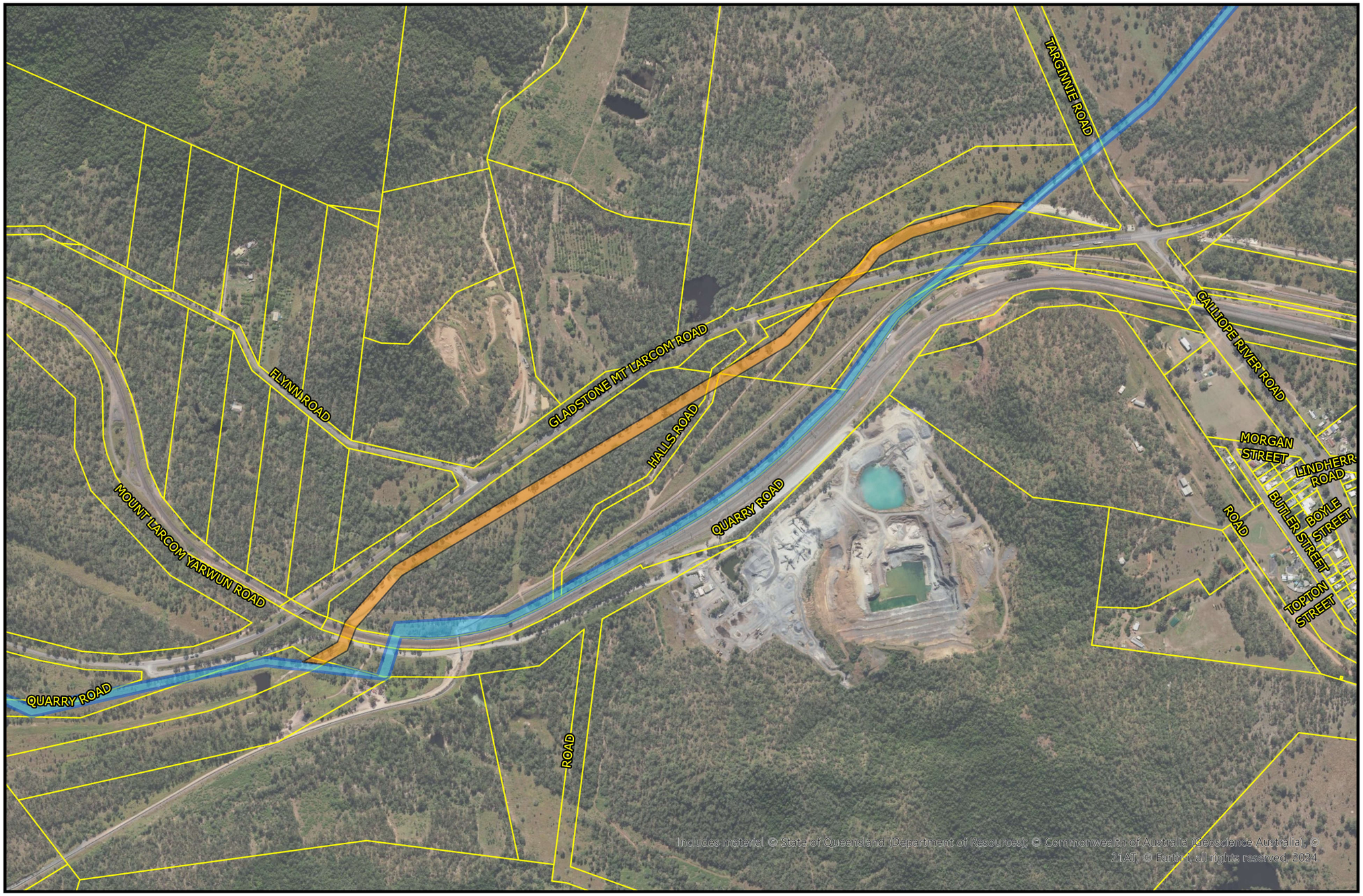
The Gladstone Area Water Board (GAWB) is a bulk water service provider based in Gladstone, Central Queensland. GAWB supplies raw water (RW) and treated water (TW) to power stations and heavy industry in and around Gladstone, and provides TW to the Gladstone Regional Council (GRC) for municipal water supply.

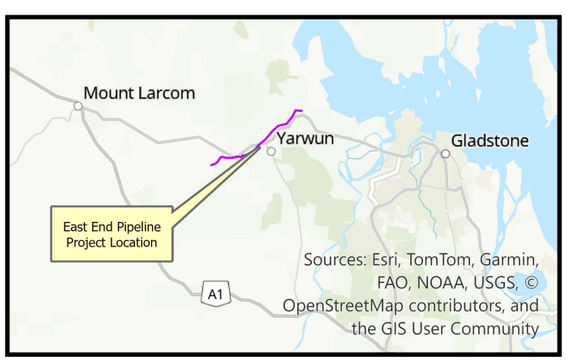
Commissioned in 1981, the East End Treated Water Pipeline (EEPL) spans 22.4 km and consists of Ductile Iron Cement Lined (DICL) and Asbestos Cement (AC) pipe sections. The AC pipeline runs from the Boat Creek Pump Station (BCPS) to Cement Australia, and from East End Mine to the East End Reservoir (EER). The BCPS is gravity-fed from the Mt Miller Reservoir (MMR) via a 3.5 km DICL pipeline.

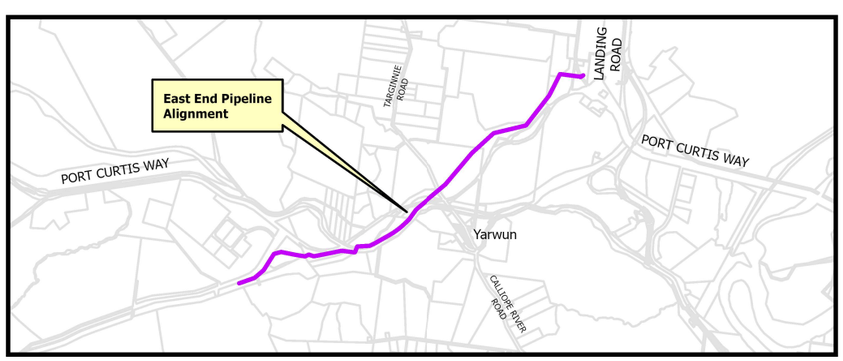
The EEPL infrastructure has reached the end of its service life and is experiencing significant failures. GAWB has therefore elected to replace the EEPL in its entirety. The new pipeline will be installed within the existing easement and footprint of the EEPL and will not trigger any planning approval requirements.

During the design phase of the replacement project, GAWB identified a highly constrained section of the EEPL where adjacent rail and road infrastructure presents significant challenges to replacement within the existing easement. This constrained section is approximately 1.9 km in length (refer to Figure 1.1). An opportunity has been identified to relocate this section northward into the GAWB-licensed corridor for the Fitzroy to Gladstone Pipeline (FGP). This corridor is a fully disturbed construction right-of-way that was recently used for the installation of the FGP.

This application seeks approval to relocate the approximate 1.9 km into the GAWB FGP disturbance footprint and licence area.







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EAST END PIPELINE REPLACEMENT PROJECT
EAST END PIPELINE ALTERNATIVE ALIGNMENT SECTION
FIG 1.1

N 0 130 260 390 520
Meters

Spatial Reference

Legend

- Property Boundary

Alignment Sections

- EEPL Existing Alignmnet
- EEPL FGP Coexisting Alternative Alignment

PROJECTION UTM ZONE 56 (Datum GDA2020)

Compiled by: C. Kelso Date 19/11/2024
D:\GDA2020\ArcGIS\Projects\CAP2020-069
000-G-MAP-3320 Version 2 Date 26/08/2025

1.1 About GAWB

GAWB is a Queensland Government statutory Water Authority with the purpose of ensuring the short and long term water needs of current and future customers are met in ways that are environmentally, socially and commercially sustainable.

On 1 October 2000, GAWB commenced operations as a Category 1 commercialised Water Authority under the *Water Act 2000* (Qld). From the 1st of July 2008, GAWB became a registered service provider under the *Water Supply (Safety and Reliability) Act 2008* (Qld). GAWB is responsible to Ms Ann Leahy MP, Minister for Local Government and Water.

1.2 Purpose of this Report

The purpose of this Planning Report is to provide supporting information required for assessment of the SDA Application (MCU) within the GSDA. Particularly, this report pertains to the proposed EEPL replacement over land described as Lots 25SP115226, 22SP115225, 13RP620157 and 91SP122250 located within the GSDA (referred to as the Site).

This SDA (MCU) application has been prepared in accordance with the *State Development and Public Works Organisation Act 1971* (SDPWO Act) and the GSDA Development Scheme (May 2022). Its aim is to assist the Office of the Coordinator-Genera (OCG) and relevant referral agencies in the assessment of the application. In summary, the following information is provided in this Planning Report:

- Background
- Subject land and locality details
- Statutory considerations for the project
- Development details
- An assessment of the developments' consistency with the objectives and land use designations of the Development Scheme for the GSDA
- Identification of potential impacts and proposed solutions/management plans to manage adverse impacts.

1.3 Development Application Details

This SDA application (MCU) is for a use defined as "utility installation" within the GSDA Development Scheme. It should be acknowledged that utility installation includes land used to provide the supply or treatment of water.

Specifically, this SDA application (MCU) is for a treated water pipeline.

The proponent and application details are summarised in Table 1.1. In addition, the following is provided as part of the SDA application (MCU):

- Application form required for this SDA application (refer to 11.1)
- Landowner consent (refer to Appendix A 11.2)
- Fee of $5,000 payable by GAWB (refer to Appendix D 11.3).

Table 1.1 ***Proponent and Application Details***

Item	Description
Applicant	Gladstone Area Water Board
Property Details	Lots 25SP115226, 22SP115225, 13RP620157 and 91SP122250
Name of Landowner	Gladstone Ports Corporation (25SP115226, 22SP115225, 13RP620157) Aurizon (91SP122250) – Refer to landowner consent in Appendix A

Item	Description
Current Land Use	Licenced area for FGP
GSDA Precinct	GSDA - Materials Transportation and Services Corridor Precinct
Development Details	Installation of treated water pipeline
Development Assessment	MCU in accordance with the SPDWO Act and the Gladstone SDA Development Scheme. The proposed development is identified as a “utility installation” use that is consistent with the preferred development intents and the assessment criteria within the GSDA Development Scheme.
Assessment Manager	Office of Coordinator-General
State interests	MCU development approval - SDA assessable development within the precinct - to develop the EEPL.
Contact details for application	GAWB – Trent Williams (Approvals Project Manager – EEPL) 147 Goondoon Street, Gladstone, QLD, 4680 Phone: 0467 769 429 Email: twilliams@gawb.qld.gov.au

2. BACKGROUND

2.1 Overview of Project and Proposed Use

Installed in 1981, the EEPL comprises 22.4 km of DICL and AC pipeline. The AC pipeline is present from the BCPS to Cement Australia and from East End Mine to the EER. The BCPS is gravity supplied by Mt Miller Reservoir, via 3.5 km of DICL pipeline. As the only pipeline delivering water along this alignment.

The EEPL is at end of life. The asset has aged, ground conditions have contributed to the deterioration. The EEPL has incurred 39 failures in the past 13 years, as many as 13 failures have occurred within the past 24 months. The EEPL services Gladstone Regional Council's Mount Larcom Reservoir, Rio Tinto Alcan Yarwun's Residue Management Area, Fortescue Future Industries' Green Electrolyser Facility, Cement Australia's East End Mine and is the only treated water supply to the Mt Larcom township. This project will deliver the GAWB strategic objectives by designing, procuring and delivering the replacement of the existing ~24 km outer diameter (OD) 200mm TW pipeline and associated boat creek pump station upgrades.

Construction is expected to commence fourth quarter 2025.

2.1.1 Fitzroy to Gladstone Pipeline

This application seeks to utilise a 1.9 km section of the Fitzroy to Gladstone Pipeline (FGP). The FPG is a $983 million initiative aimed at ensuring long-term water security for the Gladstone region by transporting water from the Lower Fitzroy River to Gladstone. The 117 km pipeline runs from the Lower Fitzroy River in Rockhampton and connects to GAWB's existing water network at Yarwun. The pipeline comprises a water treatment plant, reservoirs and pumping stations at locations along its alignment including Laurel Bank, Alton Downs and Aldoga.

An EIS for the FGP was approved under the Queensland Government's *State Development and Public Works Organisation Act 1971* (SDPWO Act) and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Construction of the FGP commenced in October 2023 and is expected to be completed in early 2026. The 117 km pipeline has been installed.

2.2 Use Being Applied For

No person may carry out a MCU in the GSDA without the approval of the Coordinator-General. An MCU is:

- The start of a new use of the premises
- The re-establishment on the premises of a use that has been abandoned
- A material change in the intensity or scale of the use of the premises.

It is considered that the proposed EEPL alternative alignment within the GSDA constitutes the start of a new use and the material increase in the intensity and scale of the use of the premises. No vegetation will be cleared as part of the project therefore operational works approval is not required.

The application is to be assessed against the objectives of the GSDA Development Scheme, including the preferred development intent of the applicable land use precinct within which the use is located, as well as the overall assessment criteria of the Scheme.

2.3 State Interest and referral triggers

The application is to identify the referral triggers under the *Planning Act 2016* and referral entities for the application as per Schedule 2, Section 2.1 of the GSDA Development Scheme. The following state interests and referrals are associated with the Site:

- MCU development approval - SDA assessable development within the precinct
- MCU for development of the EEPL replacement section only
- Referral for a MCU development approval in the Master Plan for the Priority Port of Gladstone area

Further information related to State interests and statutory considerations is provided in Section 5.

2.4 Public Consultation

During the application stage, the Coordinator-General is to decide if the SDA application requires public consultation in accordance with the Public Consultation Policy State Development Areas (State of Queensland, Coordinator-General, 2021) which applies to the GSDA. In accordance with Schedule 2, 2.3 Public Consultation Stage (1) of the GSDA, Public Consultation applies unless:

a) the application is for development for reconfiguring a lot or operational works for the clearing of native vegetation where identified in an SDA application for a material change of use or reconfiguring of a lot, or
b) the application is for a material change of use for a defined use that supports the preferred development intent of the relevant development precinct and is not located on Curtis Island, or
c) the Coordinator-General gave notice to the proponent during the application stage that the public consultation stage does not apply to the application.

The EEPL is located within the Materials Transportation and Services Corridor Precinct and is considered a preferred use in the precinct. Therefore, public consultation is not required for this application.

3. SUBJECT LAND AND LOCALITY

3.1 Location

The replacement section of the EEPL is located on Lots 25SP115226, 22SP115225, 13RP620157 and 91SP122250. The replacement section, as with the existing EEPL easement, crosses Halls Road and Gladstone Mt Larcom Road.

3.2 Existing Land Use

Lots 25SP115226, 22SP115225, 13RP620157 are currently vacant land with the exception of the FGP licence area. The current land use of the allotment is defined as 'grazing native vegetation'. There are no existing rights of the property described under the GSDA Development Scheme. Lot 91SP122250 accommodates the Aurizon rail infrastructure.

All lots are located with the Materials Transportation and Services Corridor Precinct under the GSDA.

3.3 Surrounding Land Use

The proposed location is surrounded by existing high impact industry:

Lot on Plan	Direction	Land use
91SP122250	South	Aurizon – North Coast Line
Gladstone Mt Larcom Road	North	TMR road

3.4 Existing Infrastructure

No easements exist in Lots 25SP115226, 22SP115225, 13RP620157. GAWB has an existing licence with GPC for the FGP alignment. Lot 91SP122250 is owned by Aurizon for the North Coast Line.

3.5 Community Values

The proposed replacement section is on vacant land, therefore there are no direct community values at the Site. The Site is abutted by other infrastructure (e.g. roads and rail) and is in an area where larger industry is presented, such as the Regional Group Australia, Gladstone Quarry located approximately 350 m south. The closet township is Yarwun located approximately 700 m south. Given the Site falls within the GSDA and is in a generally industrial area and a replacement of existing essential infrastructure, the community value and sensitivity of the proposed activities is considered as low.

4. ENVIRONMENTAL AND CULTURAL HERITAGE VALUE

This section outlines the environmental and cultural values pertaining to the Site.

4.1 Land

Soils

The soil on the Site is described as Duplex yellow-grey, with mapped geology MIXED VOLCANIC AND SEDIMENTARY ROCKS, Andesitic to dacitic and basaltic lavas and volcaniclastic rocks and some lacustrine sedimentary rocks; also felsic lava, ignimbrite and other volcaniclastics.

Acid sulfate soils (ASS) typically occur on land that is below 5 m Australian Hight Datum (AHD) or on land below 20 m AHD where excavation to below 5 m AHD may be undertaken. The elevation of the Site is above 20m and is not mapped as a risk of ASS.

Contaminated Land

No lots are listed on the Contaminated Land Register and/or the Environmental Management Register.

4.2 Hydrology and Coastal

Waterways

Sandy Creek is mapped to cross the proposed alternative alignment in three locations. Prior to undertaking activities in and around the watercourse, an assessment against the Accepted development requirements for operational work that is constructing or maintaining waterway barrier works (DAF, 2018) will be undertaken.

If determined necessary during the design finalisation, trenchless drilling or tunnelling may be used where the conditions do not suit the use of an open trench. Launch and receival pits are excavated on either side of the crossing location and the pipe is guided through the hole with minimal disturbance to the surface. Trenchless crossing methods involve thrust boring, pipe-jacking, micro-tunnelling and horizontal directional drilling

Wetlands

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Report (PMST) identified no national or internationally important wetlands in the vicinity of the Site (refer to Appendix E 11.4). The Port Curtis Nationally Important Wetland is approximately 3.6 km from the Site. The DES Map of Great Barrier Reef Wetland Protection Areas and Map of Queensland Wetland Environmental Values identifies that no mapped wetlands are present on the Site (refer to refer to Appendix E 11.4). Indirect impacts may occur, refer to Section 7 for further information.

Groundwater

The nearest registered groundwater bores to the Site is RN88335. Drilled in 1969, the bottom open hole is at 30 m. The EEPL activities will have no impact to the bore.

Coastal

The Site is not located within a Coastal Management District (CMD) with no associated coastal hazards including erosion prone areas, and medium and high storm tide inundation area as defined under the *Coastal Management and Protection Act 1995*.

4.3 Ecological Values

Prior to the construction of the FGP, an Environmental Impact Statement (EIS) was prepared and subsequently approved by the CG. The proposed alternative alignment was in an area identified as containing remnant vegetation fragments in poor condition, primarily due to structural disturbance and fragmentation. All vegetation within the Sites was classified as 'Not of Concern.' (refer to Appendix C, page 212, short site 38). Additionally, no threatened species were identified during site assessments.

As the 25 m construction right of way required for the installation of the FGP has been clearing of all vegetation to enable the pipeline installation, there are no remaining ecological values which will be impacted because of the EEPL alignment optimisation.

Threatened Fauna Species

A search of the EPBC Act PMST database (refer to Appendix E 11.4) identified matters of national environmental significance that may occur in, or may relate to, the Site:

- 36 threatened species:
  - 14 bird species

- Six mammal species
- Five reptile species
- 11 plant species

- 13 migratory species.

Ecological survey (refer to Appendix C, page 212, short site 38) undertaken as part of the FGP EIS did not confirm the presence of any threatened fauna species.

Section 7 provides a discussion of the potential impacts the proposed works may have on habitat and fauna species during the construction and operational phases.

4.4 Protected Areas

The EPBC Act PMST database did not identify any protected areas within 1 km of the Site. There are no other mapped/identified protected areas (such as National Parks) within or in proximity to the Project (State of Queensland, 2024).

4.5 Cultural Heritage and Native Title

There are no Aboriginal or Torres Strait Islander cultural heritage site points or polygons recorded within or adjacent to the Site. The Site has been fully disturbed for the installation of the FGP.

There are no Queensland State heritage places in proximity to the proposed works.

Native title at the proposed Site has been extinguished through past land tenure grants.

4.6 Natural Hazards

The Queensland Government Development Assessment Mapping System (State of Queensland, 2022) and Gladstone Regional Council Planning Scheme mapping (2021) identifies the following:

- The Site is mapped as a Medium Potential Bushfire Intensity hazard area
- The Site is not mapped within a flood hazard area

Bushfires have the potential to impact works, and there is potential that hot works at the Site may ignite and start a bushfire. Bushfire risks include, but are not limited to, equipment / plant damage and personnel injury or loss of like. During construction fire breaks will be incorporated into the construction footprint and appropriate emergency management plans will be implemented to identify and manage the risk of bushfire.

During the operational phase fire breaks will be maintained.

Refer to Appendix 11.6 Bushfire Management and Mitigation Plan.

5. STATUTORY CONSIDERATIONS

Table 5.1 provides a summary of Commonwealth, State and local environmental and planning legislation and their applicability to the proposed works at the Site.

Table 5.1 Legislative Requirements and Approval Triggers

Legislation	Agency	Activity Trigger	Applicability	Licence / Permit / Approval Required	Process and Supporting Information	Timeline	Additional Notes for Consideration
Aboriginal Cultural Heritage Act 2003	DATSIP	Require those conducting activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage.	**Applicable** Section 23 of the *Aboriginal Cultural Heritage Act 2003* states that a person who carries out an activity must take reasonable and practicable measures to ensure the activity does not harm Aboriginal Cultural Heritage and should follow the Duty of Care Guidelines.	CHMP and/or agreement. The ongoing nature of determining cultural heritage is acknowledged.	GAWB has previously obtained two (2) signed CHMPs for the FGP Project.	NA	The Site has been fully disturbed for the installation of the FGP.
Environment Protection Act 1992	DES	Requiring those conducting Environmentally Relevant Activities (ERA) associated with construction or operation to obtain an Environmental Authority (EA).	**Not applicable**	NA	NA	NA	
Environment Protection and Biodiversity Conservation Act 1999 – Commonwealth	Department of Agriculture Water and Environment	Actions that have or are likely to have a significant impact on a matter of national environmental significance (MNES) require approval for EPBC referral.	**Not applicable**	NA	NA	NA	

Legislation	Agency	Activity Trigger	Applicability	Licence / Permit / Approval Required	Process and Supporting Information	Timeline	Additional Notes for Consideration
Gladstone Regional Council Planning Scheme	Gladstone Regional Council	Undertaking operational works (excavation or filling) within the LGA.	**Not applicable** The Planning Regulation 2017 states that the Planning Scheme does not apply to operational works for a public sector entity authorised under State Legislation to carry out the work. Therefore, it is considered that a development permit for operational works is not required.	N/A	N/A	N/A	GAWB is currently undertaken pre-lodgement with Gladstone Regional Council to confirm that a development permit for operational works is not required.
		Interfering with a local government road.	**Applicable** Access to the Site will be from a local road.	Works on Road Corridor Permit.	Completion of an Application to carry out works on a council road or interfere with a road or its operation.	1 month	GAWB are currently undertaking pre-lodgement with Gladstone Regional Council to confirm Works of Road Corridor Permit requirements for the Site.
		Bushfire hazard	**Applicable** The Site is in a medium bushfire hazard area	N/A	This application	N/A	Bushfire hazard management plan attached as Appendix G
Land Act 1994	DoR	Owners consent requirements for work on state land for certain activities and certain approvals.	**Applicable** The Site is on EDQ and Aurizon land.	Owners consent	State forms	TBA	
Nature Conservation Act 1992 *Nature Conservation (Wildlife) Regulation 2006*	DESI	Clearing of protected plants for construction of the proposed works.	**Applicable**	Clearing Permit or Exemption Notification.		N/A	The Site has been fully disturbed for the installation of the FGP. No further application required.
		Tampering with an animal breeding place of a protected animal.	**Applicable**	Species Management Program Damage Mitigation Permit (or other if		N/A	The Site has been fully disturbed for the installation of the FGP.

Legislation	Agency	Activity Trigger	Applicability	Licence / Permit / Approval Required	Process and Supporting Information	Timeline	Additional Notes for Consideration
				not held by Fauna Spotter Catcher).			EEPL has an approved SMP which will be implemented.
State Development and Public Works Organisation Act 1971	Department of State Development (OCG)	Works within a SDA.	**Applicable** The Site is within the Gladstone SDA and is considered a MCU as the use defined as utility installation.	SDA approval (MCU).	This application	3 months	Refer to this application.
State Development and Public Works Act 1971 and Vegetation Management Act 1999	Department of State Development (OCGI) DoR	Clearing of native vegetation assessable under the *Vegetation Management Act 1999*. Schedule 3 – Requirements for SDA self-assessable development	**Applicable** Clearing of vegetation is managed under the GSDA Development scheme. Clearing is self-assessable.	Clearing is self-assessable	This report. Refer section 7.4.5	NA – assessed as compliant with GSDA Development Scheme, Table 10.	Nil
Transport Infrastructure Act 1994	Department of Transport and Main Roads (TMR), Aurizon	Use of and impacts to State-controlled transport infrastructure (roads and rail)	**Applicable**	Road corridor permit Road works approval Wayleave		At completion of full design of the EEPL replacement pipeline	Application will be lodged with TMR and Aurizon for wayleaves and permits.
Gladstone Local Laws	Gladstone Regional Council (GRC)	Relevant for interactions with GRC owned roads and infrastructure	**Applicable**	Road corridor permit Road works approval		At completion of full design of the EEPL replacement pipeline	Application will be lodged with GRC

6. DEVELOPMENT DETAILS

The development details pertinent to this Planning Report consists of the installation of approximately 1.9 km underground pipeline within a highly disturbed area which was previously used for the installation of the FGP. A summary of the infrastructure and construction methodology is detailed below. The concept design drawings are summarised in Table 6.1 and are included in Appendix B.

Table 6.1 Design Drawings

Drawing Reference	Description
P2024_12-PL-010-007_REV_E	East End Pipeline treated water alternative alignment plan and longitudinal section
P2024_12-PL-010-008_REV_D	
P2024_12-PL-010-009_REV_E	
P2024_12-PL-010-010_REV_D	

6.1 East End Pipeline Replacement

6.1.1 Description

The EEPL replacement project replaces the existing DICL and AC pipeline with a DN225 (225 mm) polyethylene (PE) pipeline. The pipeline will be buried at a depth of cover of approximately 600 mm.

No hazardous substances will be stored or used on site during the construction or operation.

6.1.2 Site Access

The construction right of way will be accessed from existing access tracks from Gladstone Mt Larcom Road.

Operational access will be limited to licence area maintenance and is expected to be up to twice a year.

6.1.3 Site and office facilities

No additional site and office facilities are required for the alternative alignment.

6.1.4 Site preparation

As the location has recently been utilised for the installation of the FGP, minimal site preparation work is required. Topsoil will be stripped and stockpiled for later reuse and environmental controls installed, such erosion and sediment controls. The installed controls will be monitored throughout construction until the Site has been stabilised.

7. DEVELOPMENT ASSESSMENT

7.1 State Development and Public Works Organisation Act 1971

The main purpose of the SDPWO Act is to facilitate co-ordinated and environmentally responsible infrastructure planning and development in Queensland. The GSDA Development Scheme, which relates to the Site, is created under Section 77 of the SDPWO Act (refer to Section 7.4).

7.2 State Planning Policy

The *State Planning Policy* (SPP) sets out the State's interests in land-use planning and development across Queensland. The SPP was updated and introduced in 2017 to coincide with the release of the *Planning Act 2016*. The SPP details the matters of State interest in land use planning which enables development, protects our natural environment, and allows communities to grow and prosper. The State interests relevant to the Site are detailed below:

– Liveable communities and housing:
  - Nil.
– Economic growth:
  - Development and construction: Development in a SDA creating jobs and providing water to communities and industry, refer to this application.
– Environment and heritage:
  - Biodiversity: No impact. The Site is completely disturbed for the previous installation of the FGP.
  - Cultural heritage: No impact. The Site is completely disturbed for the previous installation of the FGP.
  - Water quality: Water resource catchments.
– Safety and resilience to hazards:
  - Natural hazards risk and resilience: Bushfire prone area, refer to Section 4.6.
– Infrastructure:
  - Strategic airports and aviation facilities: Wildlife hazard buffer zone,
  - wildlife attracting activities are not proposed.
  - Strategic ports: Priority ports.
  - Priority ports: Gladstone priority port precincts, refer to Section 7.5.

The planning for the proposed Site has considered these matters in the likely impacts of the development and proposed mitigations measures, refer to Section 8.

7.3 Central and Western Queensland Infrastructure Plan

The Site is included within the boundaries of the Central and Western Queensland Infrastructure Plan (CWQIP). The Central and Western Queensland Infrastructure Plan (CWQIP) is the first of seven regional infrastructure plans developed to support the implementation of the 2022 State Infrastructure Strategy (SIS).

The CWQIP identifies four strategic regional priorities focusing on traditional and emerging industries, connectivity and liveability to ensure regional businesses maximise opportunities presented by decarbonisation and a changing industrial landscape so that the region remains an attractive place to live, work and visit.

The Site will be directly contribute to the CWQIP vision for the future by providing for future industries harnessing the opportunities of decarbonisation.

7.4 Gladstone State Development Area Development Scheme

The GSDA was declared in 1993. The GSDA Development Scheme is applicable to all development within the GSDA.

The Site is located wholly within the GSDA. The GSDA Development Scheme is the relevant categorising instrument, with the Coordinator-General as the assessment manager.

In accordance with Section 2.1.1(3) of the GSDA Development Scheme, a properly made SDA application will be assessed against the development assessment framework, as outlined in Table 7.1.

Table 7.1 GSDA assessable development assessment framework

Development assessment framework	Relevant section of report
▪ The strategic vision for GSDA	Refer to Section 7.4.1
▪ The overall objectives for development in the GSDA	Refer to Section 7.4.2
▪ The preferred development intent for each development precinct	The Site is located within the Materials Transportation and Services Corridor Precinct. Refer to Section 7.4.3.
▪ SDA-wide assessment criteria	Refer to Section 7.4.4

The following sub-sections provide an assessment of the proposed EEPL alternative alignment against the relevant framework of GSDA Development Scheme. Note that within the precinct identified, 'utility installation' is defined as an SDA assessable development, therefore, requiring an MCU approval.

7.4.1 Strategic Vision for the GSDA

An assessment of the Project against the strategic vision for the GSDA (Section 2.2 of GSDA Development Scheme) is provided in Table 7.2.

Table 7.2 Assessment Against the Strategic Vision for the GSDA

Strategic Vision	Proposal Response
The vision for the GSDA is:	
(a) be Central Queensland's economic powerhouse, with an efficient concentration of large-scale industry of national, State and regional significance that benefit from the SDA's strategic location near the Port of Gladstone and major road and rail networks	**Complies** The EEPL is located within an ideal location in the GSDA. It supports the existing community and expanding industrial development in Gladstone as there is a growing need to provide a reliable supply of water for growth of current consumers and future demands.
(b) support development that aligns with the Queensland Government's strategic priorities for the region, particularly related to the hydrogen industry.	**Complies** The EEPL is deemed to 'support development' as it will provide an increased reliability in supply of water to the Gladstone industrial area and hydrogen projects.
(c) maintain environmental, cultural heritage and community values where possible to support wider ecological processes and provide community benefits.	**Complies** A Construction Environmental Management Plan (CEMP) will be implemented to protect and maintain environmental, cultural heritage and community values, as well as values of the GBRWHA. The EEPL will be operated in accordance with an Operational Environmental Management Plan (OEMP) which will include

Strategic Vision	Proposal Response
	mitigation of any water quality impacts to the surrounding catchment. Refer to Section 8 of this report.
The strategic vision is supported by the overall objectives for development and preferred development intents of development precincts within the Gladstone SDA.	**Complies** Refer to Section 7.4.2.

7.4.2 Overall Objectives for Development in the Gladstone SDA

An assessment of the Project against the overall objectives for development within the GSDA (Section 2.3 of the GSDA Development Scheme) is provided in Table 7.3.

Table 7.3 ***Assessment Against the Overall Objectives***

Overall Objectives	Proposal Response
1. Development within the GSDA will:	
(a) capitalise on Gladstone SDA's strategic location and support the role and function of the Port of Gladstone	**Complies** The EEPL is fundamental to the continued growth of new industries in Gladstone.
(b) identify and implement opportunities for synergies and co-location between other uses, services and infrastructure to minimise waste and inefficiencies	**Complies** The EEPL alternative location is strategically collocated with the FGP.
(c) use land and infrastructure efficiently and be adequately serviced by infrastructure	**Complies** The EEPL alternative location is proposed to be constructed on GPC owned land, with immediate connection to the existing EEPL.
(d) ensure the integrity and functionality of the Gladstone SDA, including infrastructure corridors and future development opportunities, is maintained and protected from incompatible land uses	**Complies** It is considered that the EEPL alternative location, will maintain functionality of the GSDA as the infrastructure supports industrial development and consequently does not introduce incompatible uses.
(e) ensure new lots are appropriately sized to accommodate preferred development	**N/A** No new lots created
(f) be designed, constructed, and operated to a high quality consistent with best practice	**Complies** The Project is a QLD State Government project where a highly competent and experienced contractor will be engaged to construct and install the water pipeline. The design of the pipeline will be in accordance with the relevant Australian Standards which require best practice.
(g) avoid impacts on environmental, cultural heritage, and community values (including sensitive land uses), or minimise or mitigate impacts where they cannot be avoided and offset any residual impacts	**Complies** The alternative pipeline location is within a fully disturbed area used recently for the FGP installation. No vegetation clearing is required. Operational impacts are anticipated to be minor; however, environmental, cultural heritage and community values will be managed in accordance with an OEMP.

Overall Objectives	Proposal Response
(h) not adversely impact on the outstanding universal values of the Great Barrier Reef World Heritage Area	**Complies** The construction impacts will be managed by reducing the Project footprint where possible, as well as through the development and implementation of a CEMP. Potential impacts and management associated with the Site are discussed in Sections 8. Operational impacts are anticipated to be minor; however, environmental, cultural heritage and community values will be managed in accordance with an OEMP.
(i) manage the risks associated with the projected impacts of climate change and natural hazards to protect people and property	**Complies** Land is high enough in elevation to be considered safe from floods, and well above storm surge level, but otherwise at a suitable (low) elevation for a pump station.
(j) manage impacts of air quality on the capacity of the Gladstone airshed.	**Complies** Impacts to air quality as a result of dust and exhaust emissions may occur during construction, these will be managed in accordance with the CEMP.

7.4.3 Materials Transportation and Services Corridor Precinct

The GSDA Development Scheme's Materials Transportation and Services Corridor Precinct is the relevant precinct for this SDA application (MCU). The preferred development intent for the Materials Transportation and Services Corridor Precinct (Section 2.4.5 of the GSDA Development Scheme) and its relationship to the EEPL alternative alignment, is described in Table 7.4.

Table 7.4 Materials Transportation and Services Corridor Precinct – Preferred Development Intent Assessment

Development Intent	Proposal Response
1. The preferred development intent for the Materials Transportation and Services Corridor Precinct is described below.	
(a) This precinct provides an efficient, effective, and safe route for linear infrastructure to link to development in the Gladstone SDA and the Port of Gladstone.	**Complies** The EEPL alternative alignment complies with the Precinct intent as it supports linear infrastructure and industrial development within Gladstone. The EEPL replacement project is intended to provide security of supply and operational control over the connection to the Gladstone water network.
(b) Development in this precinct is to: (i) minimise construction and operation footprints and follow a logical sequence of development to maximise opportunities for future linear infrastructure (ii) avoid adverse impacts on existing infrastructure (iii) provide and maintain access to the corridor for construction, operation, and maintenance of existing and future linear infrastructure	**Complies** (i) The alternative alignment is collocated within the FGP licence area. (ii) The alternative alignment has been designed in consideration of existing infrastructure and any known future infrastructure. (iii) The existing access to the FGP will be utilised by the EEPL and will not require a new access point.. (iv) The alternative alignment collocates with the FGP. (v) The alternative alignment will not impact on sensitive land uses adjacent to the Gladstone SDA.

Development Intent	Proposal Response
(iv) co-exist with other linear infrastructure internal and external to the Gladstone SDA (v) recognises and manages adverse impacts to sensitive land uses adjacent to the Gladstone SDA.	
2. Defined uses that support the preferred development intent are:	
(a) linear infrastructure facility (b) utility installation	**Complies** The EEPL is a utility installation and is part of a linear infrastructure project, the EE pipeline, under the GSDA. The EEPL replacement is intended to provide security of supply and operational control over the connection to the Gladstone water network.
3. Defined uses that may be supported where the use does not compromise the preferred development intent include:	
(a) major electricity infrastructure (b) substation (c) telecommunications facility.	**N/A**
4. The creation of additional lots may only be supported where being undertaken for operational, management or regulatory purposes, or if there is an overriding need.	
	N/A
Section 2.4.5, Table 5 identifies SDA assessable development and SDA self-assessable development within the precinct.	**Complies** This SDA application has been prepared as the proposed MCU for 'utility installation' is subject to assessable development within the precinct.

7.4.4 SDA Wide Assessment Criteria

Table 7.5, provides an assessment of the EEPL alternative alignment against the SDA wide assessment criteria provided in Section 2.5 of GSDA Development Scheme.

Table 7.5 SDA Wide Assessment Criteria Assessment

Assessment Criteria	Proposal Response
2.5.1 Infrastructure and services	
(a) Development is designed to maximise efficiency and minimise the cost for infrastructure and services	**Complies** The EEPL will support industrial development with the expanding industrial area in Gladstone through the provision of a reliable supply of water for growth of current consumers and future demands. The EEPL replacement is intended to provide security of supply and operational control over the connection to the Gladstone water network.
(b) Development plans for and manages its impacts on existing and planned infrastructure and services	**Complies** During the design of the EEPL replacement project, the existing infrastructure in the area was considered to avoid conflicts with current and future known service networks, where possible. This assessment identified the need for the alternative alignment, which is collocated with the FGP, another asset of GAWBs. Both alignment options require a horizontal directional drill to cross beneath the Aurizon rail network at lot 91 SP122250.

Assessment Criteria	Proposal Response
	GAWB will gain a wayleave consent from Aurizon prior to the commencement of the drill. No other easements or licence areas are impacted.
(c) is adequately serviced by the infrastructure and services necessary to meet the demand generated by the development	**Complies** Where services are required, the development will include adequate service infrastructure as to not impact upon the existing service network within the GSDA.
(d) integrates with existing and planned infrastructure and services where possible.	**Complies** Known and potential future infrastructure was assessed during siting and design. The location of the alternative alignment is required to support the pipeline replacement project.
2.5.2 Transport	
(1) Increased traffic arising from the development is either able to be accommodated within existing road networks, or works are undertaken to minimise adverse impacts on existing and future uses and road networks.	**Complies** No change in traffic is expected with the change of alignment. A Traffic Management Plan will be prepared and implemented by the Construction Contractor. Following construction, the EEPL, will operate automatically with remote monitoring and control of the pipeline. It is expected that weekly access to the Site for monitoring or other routine licence area activities will be required. This access is infrequent in comparison to other users of the road network and not expected to result in an impact.
(2) Road networks in the Gladstone SDA are designed to accommodate the proposed vehicle type and predicted traffic volumes associated with the development and the precinct/s.	**Complies** No new access points are required. Existing access points used of the construction of the FGP will be utilised.
(3) Development is designed to facilitate safe and efficient vehicular ingress and egress and does not unduly impact on the safe and efficient operation of transport infrastructure, including corridors.	**Complies** No new access points are required. Existing access points used of the construction of the FGP will be utilised.
(4) Adequate onsite parking for the number and nature of vehicles expected is provided.	**Complies** During construction, site preparation will enable suitable room on Site to be established for construction parking.
2.5.3 Environmental nuisance	
1. Development is located, designed, and operated to avoid, minimise or manage:	
(a) adverse impacts from air, noise and other emissions that will affect the environment and/or health and safety, wellbeing, and amenity of communities and individuals	**Complies** Potential impacts during construction associated with assessment criteria 2.5.3 include: • Air impacts as a result of dust or vehicle/machinery emissions • Noise impacts associated with construction The Project is located in a rural and partly industrial area with limited community sensitive receptors (such as residences).

Assessment Criteria	Proposal Response
	The alternative alignment moves the pipeline replacement project approximately 200 m further away from residents.
(b) conflicts with sensitive uses arising from (but not limited to) spray drift, odour, noise, light spill, dust, smoke, or ash emissions.	**Complies** The EEPL is immaterial to surrounded industrial activities. The EEPL is buried infrastructure where construction and operation will be an insignificant contribution to the local industrial use.
2. The location, design and operation of development achieves the relevant acoustic objectives of the Environmental Protection (Noise) Policy 2019 and achieves the relevant air quality objectives of the Environmental Protection (Air) Policy 2019.	
	Complies The construction of the EEPL will be undertaken in accordance with a CEMP that includes compliance with the Environmental Protection (Noise) Policy and Environmental Protection (Air) Policy.
3. Development	
(a) avoids adverse impacts on the cumulative air quality of the Gladstone airshed or	**Complies** High levels of air emissions are not anticipated for the EEPL replacement project.
(b) where impacts cannot be avoided, conducts air shed modelling in accordance with current best practice to demonstrate compliance with air quality standards.	N/A
2.5.4 Contaminated land	
(1) Development on land likely to be contaminated or recorded on the Environmental Management Register or Contaminated Land Register does not adversely impact on human health or the environment by exposure, management, or movement of contaminants.	**Complies** The Site is not proposed on land likely to be contaminated. The CEMP will consider management of incidental contaminated land finds and hazardous materials / chemical spills.
(2) Where required, develop a strategy to manage any existing contamination and the potential for additional contamination, so that human health and the environment are not adversely affected.	**Complies** The Construction Contractor will manage contaminated land in accordance with a CEMP.
2.5.5 Natural hazards	
(1) Development, in accordance with current best practice	
(a) identifies relevant natural hazards that may impact upon the project (b) appropriately manages risk associated with identified hazards (c) avoids increasing the severity of natural hazards (d) avoids adverse impacts from natural hazards to protect people and property and enhances the community's resilience to natural hazards, or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset (e) avoids directly or indirectly increasing the severity of coastal erosion either on or off the site.	**Complies** Development of the EEPL replacement project will be in accordance with best practice in consideration of natural hazards. As identified in Section 4.6 hazards applicable for the Site include medium intensity bushfire risk. The installation will be in accordance with Appendix G Bushfire Management and Mitigation Management Plan. During normal operation the EEPL does not present a bushfire ignition risk, and any maintenance works will occur in accordance with relevant safety procedures that include consideration of natural hazards. No coastal hazards are mapped as affecting the Site.
Development, in accordance with current best practice, achieves an appropriate level of flood immunity and	
(a) does not adversely affect existing flow rates, flood heights, or cause or	**Complies**

Assessment Criteria	Proposal Response
contribute to other flooding impacts on upstream, downstream, and adjacent properties, or the state transport network (including potential impacts from changes to stormwater flows and local flooding).	The EEPL replacement alignment is not located in a mapped flood hazard area. There will be no impact to upstream / downstream properties or infrastructure.
2.5.6 Climate change	
(1) Development:	
(a) avoids or, if avoidance cannot be achieved, minimises net increases in the emission of greenhouse gases (b) can adapt to current and future impacts of a changing climate.	**Complies** The installation of the EEPL is directly associated with enabling climate change targeted projects. The EEPL will have negligible net increase in greenhouse gases.
2.5.7 Acid sulfate soils	
Development, in accordance with current best practice, is to:	
(a) avoid the disturbance of acid sulfate soils (ASS) or (b) ensure that the disturbance of ASS avoids or minimises the mobilisation and release of contaminants.	**Applicable** N/A. The alternative alignment is located above 20 m AHD where no ASS in likely present.
2.5.8 Water quality	
(1) Consistent with the Environmental Protection (Water and Wetland Biodiversity) Policy 2019, development avoids or, if avoidance cannot be achieved, minimises, mitigates or offsets adverse impacts on the environmental values and water quality objectives of receiving waters and wetlands arising from:	
(a) altered stormwater quality and/or flow (b) wastewater (other than contaminated stormwater and sewage) (c) the creation or expansion of regulated structures or non-tidal artificial waterways (d) the release and mobilisation of nutrients and sediments.	**Complies** Potential impacts during construction will be managed via the CEMP and a site-specific Erosion and Sediment Control Plan (ESCP) to protect the water quality of local waterways. Following completion of construction, the area will be recontoured to the previous landfall.
(2) Development encourages a precinct-wide stormwater management approach that achieves an improved water quality outcome.	**Complies** N/A. Post construction, the area will be recontoured and rehabilitated with no ongoing impact or risk to stormwater management.
(3) Development protects the ecological and hydraulic function of waterway corridors in and adjacent to the Gladstone SDA, with particular regard to the Great Barrier Reef World Heritage Area, fish passage and marine plants.	**Complies** The Site has been selected to minimise the area of disturbance to creeks and waterways. Potential impacts to surface water associated with the EEPL alternative alignment are mostly related to construction impacts and disturbance of the ground surface, which can be readily mitigated through good site practice and procedures. The EEPL alternative alignment will not have an impact on the GBRWHA, fish passage or marine plants.
2.5.9 Risk management - activities	
(1) Development is located, designed, and operated to:	
(a) minimise the health and safety risks to communities and individuals (b) avoid any potential adverse impacts from emissions and hazardous activities, or where adverse impacts	**Complies** (a) The Site is located in a rural and partly industrial area with limited community sensitive receptors (such as residences). The implementation of a CEMP will assist in mitigating impacts to sensitive receptors. (b) No hazardous chemical will be stored on the Site

Assessment Criteria	Proposal Response
cannot be avoided, impacts are minimised or mitigated (c) protect high pressure gas pipelines from encroachment that would compromise the ability of the pipelines to function safely and effective	(c) There are no high-pressure gas pipelines impacted by the Site.
(2) Activities involving the use, storage, and disposal of hazardous materials and prescribed hazardous chemicals, dangerous goods, and flammable or combustible substances are located and managed to minimise the health and safety risks to communities and individuals.	**N/A** Not triggered.
(3) Development provides adequate protection from the harmful effects of noxious and hazardous materials and chemicals manufactured or stored in bulk during natural hazard events.	**N/A** Not triggered.
2.5.10 Cultural heritage and community	
(1) Indigenous and non-Indigenous cultural heritage values, and community values of the premises on which the development is undertaken, and immediate surrounds, are identified and managed, consistent with current best practice.	**Complies** Indigenous and non-Indigenous cultural heritage values will be managed as per Section 8.
(2) Development is located, designed and operated to avoid adverse impacts on cultural heritage and community values, or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset.	**Complies** Indigenous and non-Indigenous cultural heritage values will be managed as per Section 8.
(3) Development recognises and protects the cultural heritage values associated with:	
(a) the Euroa Homestead on Lot 200 on SP239672 (b) the Mount Larcombe Station Original Homestead Site on Lot 73 on SP272417 and Lot 20 on SP272417 (c) the Targinnie Cemetery on Lot 95 on DS287.	**Complies** The Site is not located in proximity to the three CH values.
(4) Where development requires a buffer to mitigate the adverse amenity impacts of the development, including, but not limited to, visual and acoustic impacts, that buffer is accommodated within the development site.	**N/A**
2.5.11 Environment	
(1) Environmental values of the premises on which the development is undertaken, and immediate surrounds are identified and managed, consistent with current best practice.	
	Complies The alternative alignment construction right of way was recently used to construct and install the FGP. All activities will remain within the disturb footprint with no impact on the surrounding environment. A CEMP will be implemented identifies and implements best practices.

Assessment Criteria	Proposal Response
(2) Development is located, designed, and operated to:	
(a) avoid adverse impacts on environmental values including matters of local, state, and national environmental significance or where adverse impacts cannot be avoided, impacts are minimised, mitigated, or offset (b) maintain ecological connectivity and processes (c) maintain the outstanding universal value (OUV) of the Great Barrier Reef World Heritage Area including the local attributes of the OUV identified in the Master plan for the Priority Port of Gladstone and Port overlay (d) retain, to the greatest extent possible, tidal fish habitat and marine plants.	**Complies** The alternative alignment construction right of way was recently used to construct and install the FGP. All activities will remain within the disturb footprint with no impact on the surrounding environment. A CEMP will be implemented identifies and implements best practices. No tidal fish habitat or marine plants are impacted by the alternative alignment.
(3) Any residual significant adverse impacts are offset in accordance with the relevant Commonwealth or Queensland environmental offset framework.	**Complies** No Commonwealth environmental offsets are required. No clearing is required.
(4) Lighting associated with the construction and operation of development is designed to limit the impacts on aquatic wildlife, including turtles and migratory species.	**Complies** The Site construction lightening will not impact of aquatic wildlife. There is no operational light requirements.
(5) Where development requires a buffer to mitigate the impacts of the development, that buffer must be accommodated within the development site.	**N/A**
(6) Development avoids native vegetation clearing, or where avoidance is not reasonably possible, minimises clearing to:	
(a) conserve vegetation (b) avoid land degradation (c) avoid fragmentation and conserve connectivity.	**Complies** No vegetation is required.
2.5.12 Engineering standards	
(1) Development is to be designed and constructed in accordance with the relevant engineering and design standards (and any subsequent revisions to the relevant standards) stated in Table 7 below. Alternative and innovative solutions that demonstrate compliance with the relevant standards are encouraged.	**Complies** The design and construction of the EEPL replacement project will be in accordance with water industry standards and codes of practice with a view to achieving generally a design lifespan of a minimum of 75 years, taking into account the conditions of the Site and the nature of the materials and processes involved.
2.5.13 Other government matters	
(1) Development is to demonstrate consistency with any other relevant legislative requirements that may be necessary for the development to proceed and to the extent practicable, be consistent with regional plans, the State Planning Policy, the Port Overlay for the priority Port of Gladstone, and the State Development Assessment Provisions, where the State interests	**Complies** As identified within Section 7, other legislative requirements have been considered by GAWB.

Assessment Criteria	Proposal Response
articulated by these instruments are likely to be affected by the development.	
(2) Development recognises and protects the long-term availability of the extractive resource and access related to the Targinnie Key Resource Area (Number 119).	**Complies** The alternative alignment is collocated with the FGP in a licence area for the infrastructure.
(3) Development does not compromise existing or future port facilities and operation on Strategic Port Land.	**Complies** The EEPL does not compromise existing or future port facilities and operation on Strategic Port Land
2.5.14 Energy and water efficiency	
(1) Building, site design, and layout maximises energy efficiency having regard to:	
(a) building orientation and passive solar design (b) maximising opportunities for cross ventilation (c) appropriate shade treatments (d) landscaping treatments to the western side of the building.	**N/A no buildings**
(2) Water efficiency is optimised with alternative water supply sources, including:	
(a) rainwater harvesting systems (b) recycled water source.	**N/A** The EEPL replacement project aims to secure a reliable water supply to the region. Significant water use at the Site is not required during operation. For maintenance or cleaning activities appropriate water sources will be used.
(3) Where practicable, development should be consistent with the Queensland government's renewable energy policies.	**Complies** The EEPL replacement project is a Queensland Government project.
2.5.15 Visual Impacts	
(1) Visual impacts of buildings, retaining structures, or other development are minimised through building design, landscaping, and use of appropriate materials when viewed from a publicly accessible viewpoint such as major roads and the Mount Larcom landform.	**Complies** The alternative alignment will not be visible from a publicly accessible viewpoint.
Development maintains and enhances significant vegetation where possible and provides landscaping that:	
(a) minimises the visual impacts of the development (b) incorporates at least 50 per cent local species (c) is low maintenance.	**N/A** The licence area will be maintained by slashing and keeping the grass low.
2.5.16 Reconfiguring a lot	
(1) Development provides lawful, safe and practical access.	**Complies** The existing access points to the FGP will be utilised for the construction of the EEPL alternative alignment.
(2) Lot sizes are adequate to accommodate a development footprint consistent with the preferred development in each precinct. A range of lot sizes is preferred to accommodate development in each	

Assessment Criteria	Proposal Response
precinct. Minimum lot sizes for development precincts are generally consistent with the following:	
(a) Port Related Industry Precinct – 2 hectares (ha) (b) High Impact Industry Precinct – 10 ha (c) Medium Impact Industry Precinct - 2 ha (d) Industry Investigation Precinct – 2 ha	N/A

7.4.5 The clearing of native vegetation with the GSDA

Schedule 3 (3) of the GSDA Development scheme requires '*A proponent who carries out SDA self-assessable development for operational works for the clearing of native vegetation where identified in an SDA application for a material change of use or reconfiguring a lot must comply with the relevant requirements set out in Table 10 and section 3.1*'.

The development of the EEPL alternative alignment will not involve the clearing of QLD government mapped vegetation within the GSDA as it will be located within an existing cleared right of way.

7.5 Priority Ports – Gladstone

The Site is within the boundaries of the Master Plan for the Priority Port of Gladstone (TMR, 2020). The relevant precinct is the port, industry and commerce precinct. The Master Plan and associated Port Overlay recognises the purpose of the GSDA and refer to the GSDA Development Scheme. The outcomes for the precinct are:

> *Development within this precinct provides for a range of industries which are of regional, state, national and global economic significance, and supply chain infrastructure that supports the operation of the port and industry. For example, uses in this precinct may include manufacturing industries, refineries, warehouses, wholesale trade, transport services, distribution centres and associated residue storage and waste management facilities.*
>
> *The precinct may include associated infrastructure required for daily operations of the port such as security, customs and quarantine requirements, parking facilities, utility installations, and materials transportation infrastructure to support industry.*
>
> *This precinct may also include other development that does not compromise the existing and future expansion of port operations, port related industry and supply chain infrastructure.*

The EEPL is a utility project with an objective to provide ongoing water security to private and industrial customers in the Gladstone region. Therefore, the EEPL replacement project and alternative alignment align with the outcomes of the port, industry and commerce precinct and the Master Plan.

8. IMPACTS OF PROPOSAL AND MANAGEMENT

Development of the EEPL alternative location has a very low potential to impact environmental values and existing infrastructure during the design, construction and operation phases. Table 8.1 outlines the potential impacts that may occur to the following matters during the design, construction and operational phases:

- Land tenure and landowners
- Land
- Water resources including surface and groundwater
- Biodiversity including fauna, flora and vegetation communities
- Sensitive receptors
- Existing infrastructure
- Cultural heritage
- Community values.

The impacts to these matters will be required to be managed by GAWB and its relevant Contractors and are detailed in Table 8.1.

Table 8.1 Key potential impacts during project construction and operation phases and proposed mitigation measures

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
Land		Excavation at the Site has the potential to result in erosion of exposed surfaces and stockpiles, particularly for dispersive soils. Potentially leading to erosion and sedimentation, and associated water quality and ecosystem health impacts. Potential disturbance of unidentified contaminated land, or creation of contaminated land due to spills. Subsidence of backfilled trench, which could lead to gully erosion and affect local catchment hydrology if soils have not been compacted to a level corresponding with the surrounding soils.	Erosive and dispersive soils are not recognised or treated appropriately during maintenance, leading to erosion and sedimentation, and associated water quality and ecosystem health impacts.	**Design** – Undertake geotechnical investigation. – Minimise land disturbance as much as practical. **Construction** – Implement a CEMP. – Develop, implement and maintain an ESCP that is certified by a Certified Professional in Erosion and Sediment Control (CPESC). – Minimise the stockpiling of spoil as much as possible, particularly during the wet season. This will require regular removal of excavated material from Site. – Compact backfilled soils to a level commensurate with the surrounding soils and slope risk. – Implement progressive revegetation and rehabilitation or install temporary protection measures to reduce erosion. – Only import fill materials (for structural or landscaping purposes) that are certified as contaminant free. – Maintain, monitor and remediate, as required, stabilisation works including landscaping and rehabilitation works. **Operation** – Minimise soil disturbance when undertaking maintenance earthworks. – Prepare and implement an OEMP.
Hydrology	The pipeline installation proposes minimal landform changes that have potential to result in localised stormwater alterations.	Contamination through the release of polluting substances (e.g. spills of fuels or oil, or litter), disturbance of contaminated material, or inappropriate waste disposal.	Changes due to during construction works (e.g. release of sediment laden water). During maintenance activities sediments entering	**Design** – Design appropriate stormwater mitigation. **Construction** – Install stormwater protection and management structures, particularly in erosion prone areas. – Retain vegetation in erosion prone areas as much as possible or implement stabilisation of

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
		Changes due to surface and stormwater discharge from the Project during construction works (e.g. release of sediment laden water) and reduced bank stability (erosion) of receiving drainage pathways. Changes to the hydrological regime and reliant vegetation associated with the extraction of water from existing sources for construction purposes. Sediments entering drainage lines, waterways or wetlands and causing a reduction in downstream water quality.	drainage lines, waterways or wetlands and causing a reduction in downstream water quality.	exposed/disturbed soils (e.g. temporary geofabric/revegetation). – Implement a CEMP, that includes: • Measures for managing fuel and chemical handling, storage, distribution and spill response during construction. • Drainage, erosion and sediment control measures. – Schedule works for the dry season, where possible. – Dispose wastewater offsite at a licenced facility. – Implement water sensitive urban design principles. – Restore local drainage profiles following construction. **Operation** – Install control systems to shut down the pipeline in event of a rupture and screening of pipe intake. – Implement an OEMP and maintenance procedures to manage leakages from the pipeline, pipeline degradation, possible groundwater contamination resulting from pesticide use, and monitoring of groundwater to detect possible contamination.
Vegetation / Flora	Loss of native vegetation caused by clearing based on design.	Loss of native vegetation caused by clearing beyond that which is required for construction. Introduction and spread of weeds to the project by construction vehicles and machinery.	Introduction and spread of weeds to the project by operational vehicles and machinery during routine inspections and maintenance works.	**Design** – Existing cleared FGP right of way will be utilised. **Construction** – Implement a CEMP. – Identify and delineate the approve area of disturbance to minimise the risk of impact upon flora. – No vegetation clearing. – Revegetate disturbed areas with local native flora species. – Implement biosecurity management measures such as vehicle wash-downs and inspections, hygiene certification for materials to be used during construction, and active weed control at the Site.

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
				– Clearly communicate mitigation measures to contractors to ensure awareness, including installing temporary signage to inform personnel of protected species that may be present. **Operation** – Implement an OEMP. – Implement biosecurity management measures. – Monitor the effectiveness of controls and establishing triggers for corrective action where potential impacts are observed.
Fauna	Loss or disturbance to threatened fauna habitat or breeding places caused by clearing based on design.	Loss and fragmentation of habitat used by a range of fauna. Fauna injury or death during the construction of the project. Noise and vibration will be generated by the project during construction works. Increases in noise and vibration may result in habitat becoming unsuitable for fauna.	Fauna injury or death during the operation of the project.	**Design** – Existing cleared FGP right of way will be utilised. **Construction** – Implement a CEMP. – Install fauna exclusion fencing around construction area. – Installing temporary fencing around non-works areas with retained ecological values to prevent entry during construction. – Implement an ESCP. – Implement biosecurity management measures such as vehicle wash-downs and inspections, hygiene certification for materials to be used during construction, and active weed control within the project area. – Clearly communicate mitigation measures to contractors to ensure awareness, including installing temporary signage to inform personnel of protected species that may be present. **Operation** – Implement an OEMP. – Monitor the effectiveness of controls and establishing triggers for corrective action where potential impacts are observed.
Air Quality	Design may influence air quality (e.g. unformed	Exhaust emissions from site plant, equipment and vehicles.	Only relatively small effects on local air quality are	**Design**

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
	roads resulting in ongoing dust).	Fugitive dust emissions from construction related activities including excavation, vegetation clearing and movement of vehicles.	anticipated from the operational traffic associated with the project. As such, the effect of the operational project on local air quality is negligible and there is no need for operational-phase mitigation measures.	– Prevent dust emissions where possible, rather than applying dust suppression methods. – Identify appropriate water sources for dust suppression purposes (water used should not lead to soil contamination), or where water resources are scarce, dust stabilisers could be used. – No specific measures related to mitigating greenhouse gases have been provided due to the relatively low contribution of the project to these emissions during construction. **Construction** – Implement a CEMP. – Damp down of Site roads during prolonged dry periods and regular cleaning of hard-surfaced Site entrance roads. – Ensure that dusty materials are transported, stored and handled appropriately. – Confine vehicles to designated routes that are constructed from an appropriate material to minimise dust, and restricting vehicle speeds on access roads and other unsurfaced areas of the Site.
Noise and vibration	Minimal disturbance due to the location being remote and within proximity to existing highly industrialised areas	Increased levels of construction-related noise and vibration	It is not expected that the installation will impact on receptors during operation.	**Design** – If required, design appropriate vibration control elements for adjacent infrastructure. **Construction** – Implement a CEMP that establishes work hours, work practices, community liaison requirements, mitigation measures, roles and responsibilities and construction noise monitoring protocols. – Implement source noise control strategies, e.g. keep horns and reversing alarms to the minimum volume level possible, use non-tonal / broadband type reversing alarms and use stockpiled materials as “noise barriers” to shield sensitive receivers. **Operation** – Implement an OEMP.

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
European heritage	There are no European heritage values within Site.	There are no European heritage values within the Site.	There are no European heritage values within the Site.	No proposed mitigation measures.
Aboriginal heritage	Aboriginal Cultural Heritage sites may be encountered at Site and be directly impacted.	There are no known Aboriginal Cultural Heritage values within the Site.	There are no known Aboriginal Cultural Heritage values within the Site.	**Design** – Site previously completely cleared. **Construction** – Implement the CHMP and any required site-specific procedures as per the *Aboriginal Cultural Heritage Act 2003* and associated Duty of Care Guidelines. – Attend a Cultural Heritage induction for all persons engaged in ground disturbing activities prior to commencing works. – Consult with relevant stakeholders to reduce disturbance to identified Aboriginal sites. – Establish a procedure for unexpected cultural heritage finds and 'Discovery of Human Remains' in the unlikely event that suspected human remains are uncovered. **Operation** – Attend a Cultural Heritage induction for all persons engaged in ground disturbing activities prior to commencing works. – Implement an OEMP.
Community values	The Site does not impact community values.	The Site does not impact community values.	The Site does not impact community values.	**Design** – Due to the low sensitivity of visual amenity impact, no specific design measures are proposed. **Construction** – Implement a CEMP. – Landscape and rehabilitate disturbed areas as soon as possible. – Use locally endemic vegetation species in rehabilitation that are known to be well adapted to the area and soils. – Minimise vegetation clearing, where practical.

Values	Potential Impacts - Design	Potential Impacts - Construction	Potential Impacts - Operation	Proposed Mitigation Measures
				– Restrict lighting of compounds and worksites to low impact lighting and minimise lighting spill. – Locate storage facilities away from residential areas. – Store materials and machinery neatly during the works, and where possible behind solid hoardings. – Maintain access roads to works areas as free of dust and mud as far as reasonably practicable. – Maintain a high level of housekeeping at all times. – Remove all construction materials to a suitable location upon completion of construction. **Operation** – Implement an OEMP.

9. CONCLUSION

This assessment has been undertaken in accordance with the provisions of the GSDA Development Scheme, and the proposed SDA application requirements for a MCU for 'utility installation' over the Site in accordance with the SDPWO Act.

A full assessment of the EEPL alternative alignment has been made against the strategic vision and overall objectives of the GSDA Development Scheme, the preferred development intent of the Materials Transportation and Services Corridor Precinct and the SDA-wide assessment criteria. The conclusion of this assessment is that the proposed development achieves compliance with the relevant strategic vision, objectives and intents of the GSDA Development Scheme.

The EEPL alternative alignment is considered to be appropriate for the area based on the following justification:

- The EEPL directly supports the industrial land uses within the GSDA through the provision of a secure water supply.
- The EEPL accords with the relevant objectives of the GSDA Development Scheme and the preferred development intent of the relevant precincts.
- The location of the EEPL alternative alignment is appropriate and has been sited to ensure minimal disruption to existing (and future proposed) services and the amenity of the area.
- The location of the alternative alignment has been situated to ensure minimal impacts upon the environment and local biodiversity.

Having regard to the justification provided in Section 2.4 of this Planning Report under the Public Consultation Policy State development areas (State of Queensland, Coordinator-General, 2021), public consultation is not considered required in this instance.

It is recommended that the Coordinator-General supports this SDA application (MCU) to meet the growing need to provide a reliable supply of water for the current industrial and residential consumers and future demand in Gladstone.

10. REFERENCES

State of Queensland 2024, *Queensland Globe mapping database*, State of Queensland. Available from: https://qldglobe.information.qld.gov.au/. Accessed October 2024

11. APPENDICES

11.1 Appendix A - Landowner Consent

GLADSTONE REGIONAL COUNCIL

3 September 2025

Mr T Williams – EEPL Approvals Manager
Gladstone Area Water Board
1/52 Merivale Street
BRISBANE QLD 4001

BY EMAIL ONLY: twilliams@gawb.qld.gov.au

Dear Sir,

RE: LAND OWNER'S CONSENT – DEVELOPMENT APPLICATION FOR MATERIAL CHANGE OF USE AND OPERATIONAL WORKS – GLADSTONE PORTS CORPORATION MATERIALS TRANSPORTATION & SERVICES CORRIDOR WITHIN THE GLADSTONE STATE DEVELOPMENT AREA

We refer to application for Council consent for received 18 August 2025.

We note that you are seeking consent from Council as landowner for the road segment parcels listed in Attachment A. Council hereby provides written consent for the lodgement of Development Application – Material Change of Use within the GSDA – East End Pipeline Replacement Project. Owner's consent is granted on the following conditions:

- Consent is strictly limited to enabling the applicant to lodge an application with the relevant approving authority;
- It is the responsibility of the applicant to determine the suitability of application and if the land is appropriate for the intended use. All costs, fees and charges applicable to the application lodgement is at the expense of the applicant;
- Relevant advice should be sought from a suitably qualified professional (town planner, building certifier, engineer, designer, surveyor, environmental specialist);
- This consent does not authorise applicant to act on behalf of Council. Applicant is not an agent of Council;
- This consent does not provide right of tenure or agreement by Council for use of the land until Council and the relevant entity enter into and execute the applicable tenure documents (including a Crossing Deed) on terms and conditions as approved by Council;
- This consent is not permission to commence construction works on the land; and
- This consent is valid for a period of twelve (12) months from the date of this letter.

If you require any further information, please do not hesitate to contact Council at (07) 4970 0700 or by emailing info@gladstone.qld.gov.au.

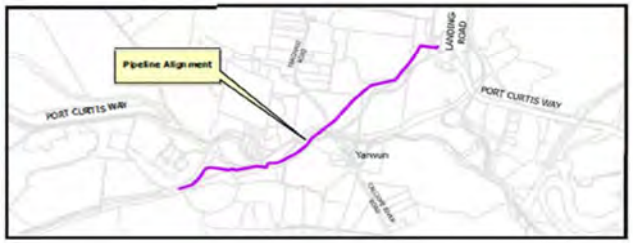
Yours sincerely,

ALI MOORE
MANAGER ENVIRONMENT AND CONSERVATION
Encl.

GLADSTONE REGIONAL COUNCIL

ATTACHMENT A

Site locations in Halls Road and Gladstone Mount Larcom Road (blue hatching) relevant for landowners consent



PROPERTY DETAILS	
LAND OWNER	Department of Transport and Main Roads (TMR)
LOCAL GOVERNMENT	Gladstone Regional Council

Gladstone Area Water Board

P.O. Box 466, Gladstone QLD 4680
Ph: 07 4976 3000 www.gawb.qld.gov.au

EAST END PIPELINE REPLACEMENT PROJECT
LAND SUBJECT TO LAND OWNERS REQUEST
HALLS ROAD

0 30 60 90 120
Meters

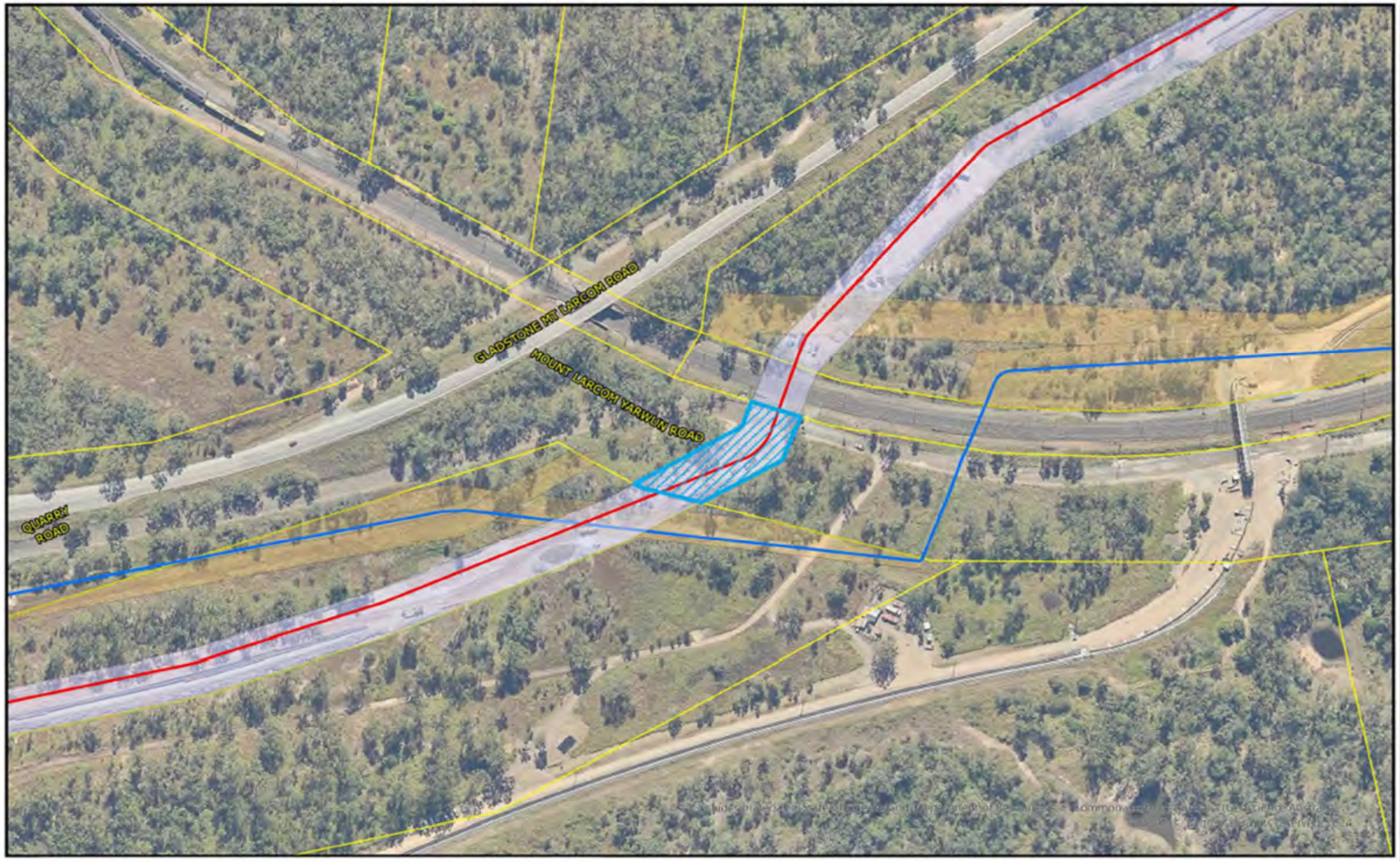
Spatial Reference

Legend

- East End Treated Water Pipeline
- Easement
- Property Boundary
- GSDA Right Of Way
- Fitzroy Gladstone Pipeline Coexist Alignment
- Halls Road

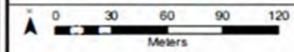
PROJECTION UTM ZONE 56 (Datum GDA2020)

Compiled by: C.Kenyon Date: 19/11/2024
D:\GDA2020\ArcGIS\Project\EAP2020-069
000-G-MAP-3319 Version 1 Date 18/06/2025



Gladstone Area Water Board
P.O. Box 466, Gladstone QLD 4680
Ph: 07 4976 3000 www.gawb.qld.gov.au

EAST END PIPELINE REPLACEMENT PROJECT
LAND SUBJECT TO LAND OWNERS REQUEST
GLADSTONE MOUNT LARCOM ROAD



Spatial Reference

Legend

- East End Treated Water Pipeline
- Easement
- Property Boundary
- GSDA Right Of Way
- Fitzroy Gladstone Pipeline Coexist Alignment
- Gladstone Mount Larcom Road

PROPERTY DETAILS	
LAND OWNER	Department of Transport and Main Roads (TMR)
LOCAL GOVERNMENT	Gladstone Regional Council

PROJECTION UTM ZONE 56 (Datum GDA2020)

000-G-MAP-3318 Version 1 Date 18/08/2025

Queensland Government

Our ref
Your ref
Enquiries Dale Bowden

Department of
Transport and Main Roads

8 September 2025

Mr Trent Williams
EEPL Approvals Manager
Gladstone Area Water Board
1/52 Merivale Street
BRISBANE QLD 4001

twilliams@gawb.qld.gov.au

Dear Trent

LANDOWNERS CONSENT
GLADSTONE AREA WATER BOARD - DEVELOPMENT APPLICATION FOR MATERIAL CHANGE OF USE & OPERATIONAL WORKS - GPC MATERIALS TRANSPORTATION & SERVICES CORRIDOR WITHIN THE GLADSTONE STATE DEVELOPMENT AREA

It is advised that the Department of Transport and Main Roads (TMR) as representative owner of the Gladstone Mt Larcom Road and Hall Road hereby provides its written consent to allow Gladstone Area Water Board (GAWB) to submit the following development application to be considered by the appropriate assessment manager and referral agencies:

- Development Application - Material Change of Use within the GSDA - East End Pipeline Replacement Project

This consent does not negate the requirement for the proponent to gain any relevant legislated approvals from TMR, the relevant local council or other government entities.

This consent remains valid from the day issued for a period of 6 months and is subject to GAWB executing final tenure documentation (if required) acceptable to TMR before any works commence on the subject site.

TMR regulates structures, works and activities that occur within land administered or owned by the department. It will be necessary to obtain TMR approval prior to accessing or undertaking works within an existing or future state-controlled road corridor.

Program Delivery And Operations
Central Queensland Region
Floor 1 Rockhampton - Knight Street Complex
31 Knight Street Rockhampton
PO Box 5096 Red Hill Rockhampton Qld 4701

Telephone +61 7 4931 1535
Website www.tmr.qld.gov.au
Email Dale.J.Bowden@tmr.qld.gov.au
ABN 39 407 690 291

If you have any queries or wish to seek clarification about any of the details in this response, please contact Dale Bowden on 4931 1535.

Yours sincerely

Dale Bowden
Manager (Project Planning & Corridor Management)

Queensland Government

Enquiries Cameron Scott

Department of
Transport and Main Roads

19 August 2025

Trent Williams
EEPL Approvals Manager Gladstone Area Water Board
1/52 Merivale Street
Brisbane QLD 4001

twilliams@gawb.qld.gov.au

Dear Trent

REQUEST TO OBTAIN OWNER'S CONSENT- DETERMINATION NOTICE

This notice is in response to your request of 18 August 2025 to obtain owner's consent from the Department of Transport and Main Roads (TMR) to lodge a development application completely or partially over land held or administered by the department.

Pursuant to section 2.1(2)(d) in Schedule 2 of the *Gladstone State Development Area Development Scheme, May 2022 (GSDA Scheme),* the consent of the owner of land that is the subject of a development application is required in order for the development application to be considered as "properly made". Under Schedule 1 of the GSDA Scheme, the Chief Executive of the Department of Transport and Main Roads is taken to be the owner of the land. The department has considered your request and **provides owner's consent** for the making of the following application:

Material Change of Use for a replacement East End pipeline which involves rail corridor land, being Lot 91 on SP122250.

This consent only applies to the submitted application.

TMR's owner's consent is only provided for the purposes of making the application and does not:

- constitute TMR's approval of, or support for, the development application for the purpose of the Development Assessment System (DAS);
- provide permission to undertake works on land held or administered by the department associated with a development approval without the permission of TMR;
- remove the requirement to obtain any other approvals from TMR or another government department;
- constitute owner's consent for any other development application over land owned or administered by the department; or
- constitute approval for any person to enter a rail corridor.

TMR regulates structures, works and activities that occur within land administered or owned by the department. It may be necessary to obtain TMR or Railway Manager approval prior to accessing or undertaking works within an existing or future transport corridor.

If you have any queries or wish to seek clarification about any of the details in this response, please contact Cameron Scott on 3066 7432.

Yours sincerely

David Gleadow
A/Manager, Rail Corridor Management
Authorised Delegate of the Chief Executive

Gladstone Ports Corporation

Growth, prosperity, community.

#2023607:cg
Our Ref: Clive Gibson

11 September 2025

Mr Trent Williams
EEPL Approvals manager
Gladstone Area Water Board
1 52 Merivale Street
BRISBANE QLD 4001

twilliams@gawb.qld.gov.au

Dear Trent,

LAND OWNERS CONSENT
GLADSTONE AREA WATER BOARD ("GAWB") – DEVELOPMENT APPLICATION FOR MATERIAL CHANGE OF USE AND OPERATIONAL WORKS – PART GPC MATERIALS TRANSPORTATION & SERVICES CORRIDOR WITHIN THE GLADSTONE STATE DEVELOPMENT AREA ("GSDA")

It is advised that the Gladstone Ports Corporation Limited **("GPC")** as Land Owner of Lot 25 on SP115226, Lot 22 on SP115225 and Lot 13 on RP620157 depicted in Annexure A, hereby provides its written consent to allow GAWB to submit the following development application to be considered by the appropriate assessment manager and referral agencies: -

- Development Application – Material Change of Use and Operational Works within the GSDA – in relation to the proposed relocation / utility installation to provide the supply or treatment of water associated with the East End Pipeline Project.

This Consent is provided for the purpose of lodgement of the specified development application only and is issued under the following conditions: -

- no right of tenure is provided, nor any agreement given by GPC to any defined route or location within GPC's Materials Transportation & Services Corridor until such time as GPC and GAWB enter into and execute the applicable tenure documents on commercial terms and conditions as approved by GPC. Such approval may be subject to the authorisation of the GPC Board and require the relevant Shareholding Minister's approval; and
- all new infrastructure located on GPC land must be situated below ground, within the approved tenure area and constructed in accordance with the development approval and tenure document terms and conditions; and
- all existing redundant infrastructure within the existing easements on GPC land are removed, the land is remediated, and the easement areas are surrendered.

Further, this consent does not negate the requirement for the proponent to gain any relevant legislated approvals from Gladstone Ports Corporation, the relevant local government, or other government entities. The proposed development may also require Building works approval under the *Building Act* 1975 and relevant advice should be sought from a suitably qualified professional (e.g. private building certifier).

Gladstone Ports Corporation

Growth, prosperity, community.

Additionally, this consent should not be taken as permission to begin any construction works on site.

This consent remains valid from the day issued for a period of 6 months.

If you have any queries concerning this consent, please do not hesitate to contact GPC's Property Specialist, Clive Gibson on 4976 1334. For any Development Approval queries please contact GPC's Planning Specialist Trudi Smith on 4976 1314 or Principal Planner Erin Clark on 4976 1287.

Yours sincerely,

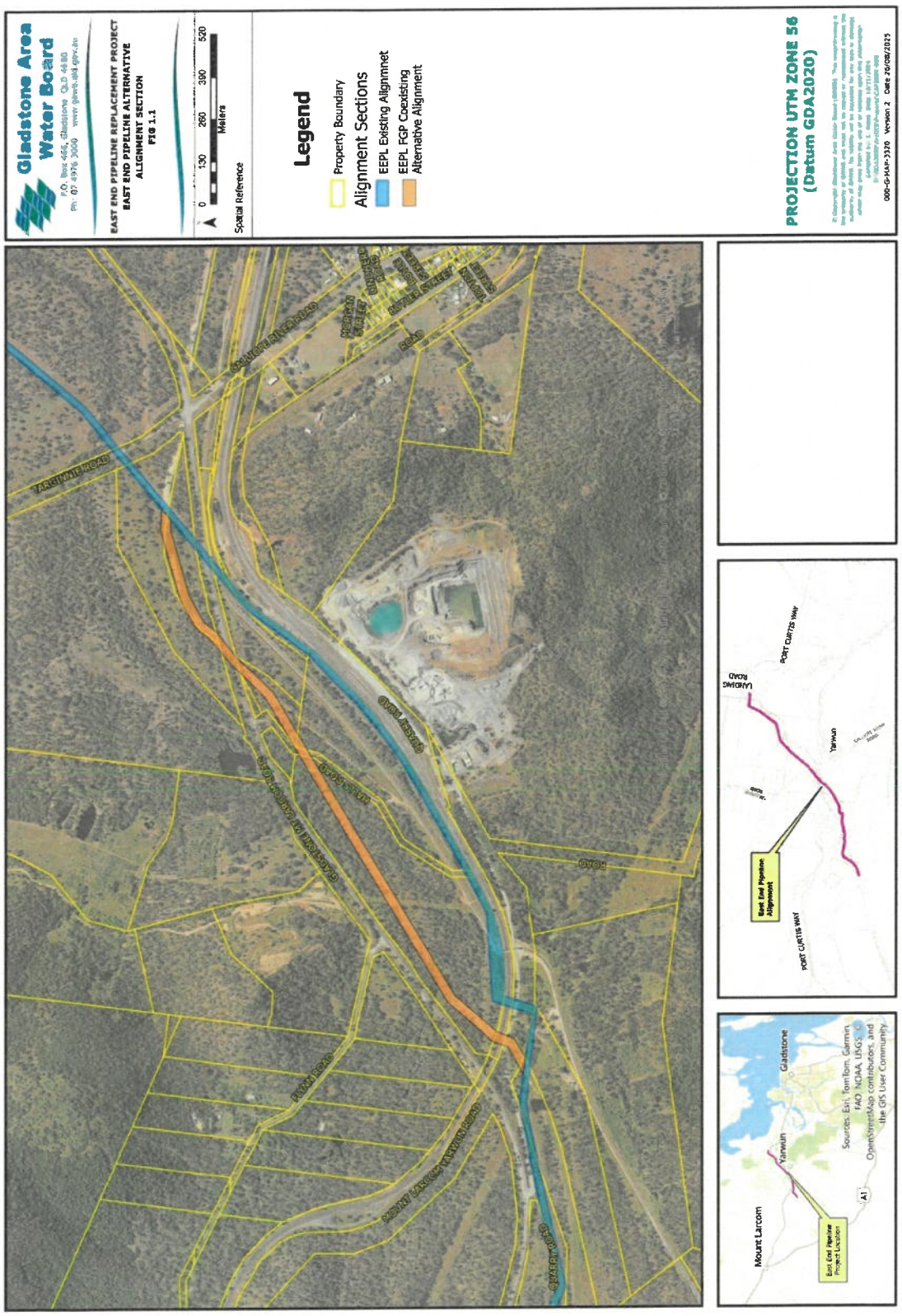
Jenelle Druce
ACTING CHIEF EXECUTIVE OFFICER

Gladstone Ports Corporation Limited
T: +61 7 4976 1333 • Fax: +61 7 4972 3045 • 40 Goondoon St/PO Box 259, Gladstone QLD, 4680, AUSTRALIA • www.gpcl.com.au
ACN 131 965 896 ABN 96 263 788 242

Gladstone Ports Corporation

Growth, prosperity, community.

ANNEXURE A – LOCALITY PLAN



11.3 Appendix C – Concept design

LEGEND:

PROPOSED:

- AIR VALVE
- SCOUR VALVE
- ISOLATION VALVE
- CONTROL VALVE
- SWABBING POINT
- TREATED WATER PIPELINE (STAGE 1)
- TRENCHLESS INSTALLATION
- TREATED WATER ALT ALIGNMENT
- FGP ALIGNMENT
- FUTURE RAW WATER PIPELINE

LEGEND:

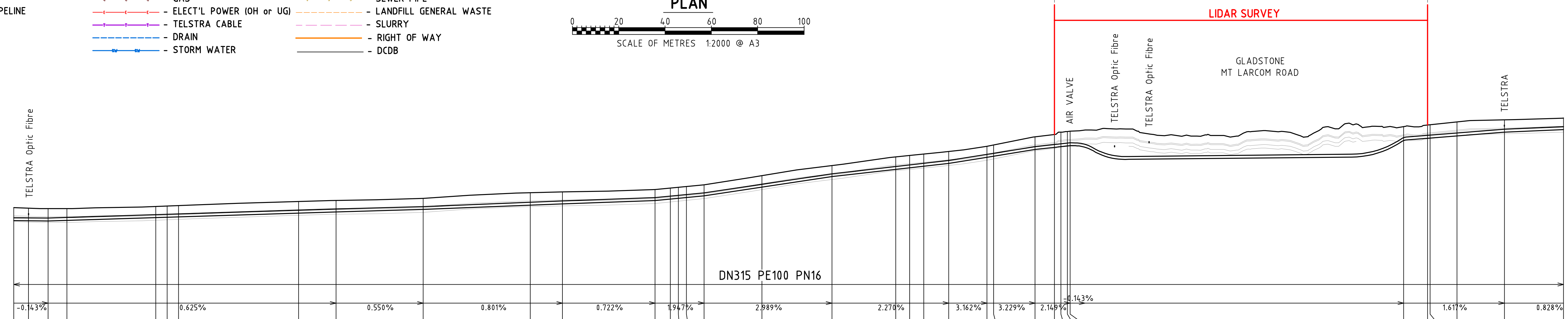
EXISTING:

- FENCE
- GAS
- ELECT'L POWER (OH or UG)
- TELSTRA CABLE
- DRAIN
- STORM WATER
- WATER OTHER
- SEWER PIPE
- LANDFILL GENERAL WASTE
- SLURRY
- RIGHT OF WAY
- DCDB

PLAN

0 20 40 60 80 100
SCALE OF METRES 1:2000 @ A3

FOR CRITICAL CROSSING
REFER P2024_12-CC-001-021



Datum 10.000m

Chainage	DEPTH TO INVERT	NAT. SURFACE	INVERT OF PIPE
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4783.42	1.08	19.78	18.69
4791.84	1.06	19.74	18.68
4800.00	1.02	19.75	18.73
4838.37	0.96	19.93	18.97
4843.27	0.97	19.97	19.00
4848.16	0.98	20.01	19.03
4900.00	1.00	20.36	19.36
4916.12	0.99	20.45	19.46
4953.78	0.95	20.61	19.66
5000.00	1.07	21.10	20.03
5013.91	1.03	21.18	20.14
5053.85	0.95	21.38	20.43
5060.42	0.95	21.51	20.56
5063.92	0.95	21.58	20.63
5067.42	0.95	21.65	20.70
5075.00	0.95	21.80	20.85
5100.00	0.99	22.58	21.59
5130.19	0.95	23.44	22.49
5157.70	1.08	24.20	23.12
5163.76	1.06	24.32	23.26
5169.81	1.04	24.43	23.39
5180.62	1.02	24.66	23.64
5197.12	0.95	25.11	24.16
5200.00	0.97	25.23	24.25
5217.86	1.09	25.93	24.83
5226.24	1.12	26.13	25.01
5229.03	1.26	26.33	25.07
5231.81	1.25	26.39	25.13
5232.99	1.25	26.41	25.16
5376.99	1.19	26.80	25.61
5387.28	1.15	26.95	25.80
5388.41	1.15	26.97	25.82
5400.00	1.20	27.21	26.00
5420.46	1.05	27.38	26.33
5445.97	0.99	27.54	26.55

LONGITUDINAL SECTION

4 0 4 8 12 16 20
VERTICAL SCALE OF METRES 1:400 @ A3

20 0 20 40 60 80 100
HORIZONTAL SCALE OF METRES 1:2000 @ A3

REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND
NAME:
RPEQ NO.:
DIVISION:
SIGNATURE: ______________ DATE: - / - / -

ISSUED FOR TENDER
NOT TO BE USED FOR CONSTRUCTION PURPOSES

REV	DATE	REVISION DESCRIPTION	DRN	CHKD	EXT. APP.	GAWB ACC.	REFERENCE DRAWINGS	NUMBER
							-	
							-	
							-	
E	16/07/25	ALIGNMENT UPDATED	VE	MM	PS		-	
D	14/03/25	MATERIAL & LEGEND UPDATED	VE	MM	PS		-	
C	05/12/24	CC REFERENCE UPDATED	AD	MM	PS		-	
B	23/11/24	ISSUED FOR TENDER	AD	MM	PS		-	
A	29/10/24	PRELIMINARY DESIGN ISSUED FOR REVIEW	AD	MM	PS		-	

W3 Plus Consulting
world wide water plus

DO NOT SCALE

Gladstone Area Water Board
136 Goondoon Street Gladstone Q 4680
PO Box 466 Gladstone Q 4680
Tel: (07) 4976 3000
ABN: 88 409 667 181

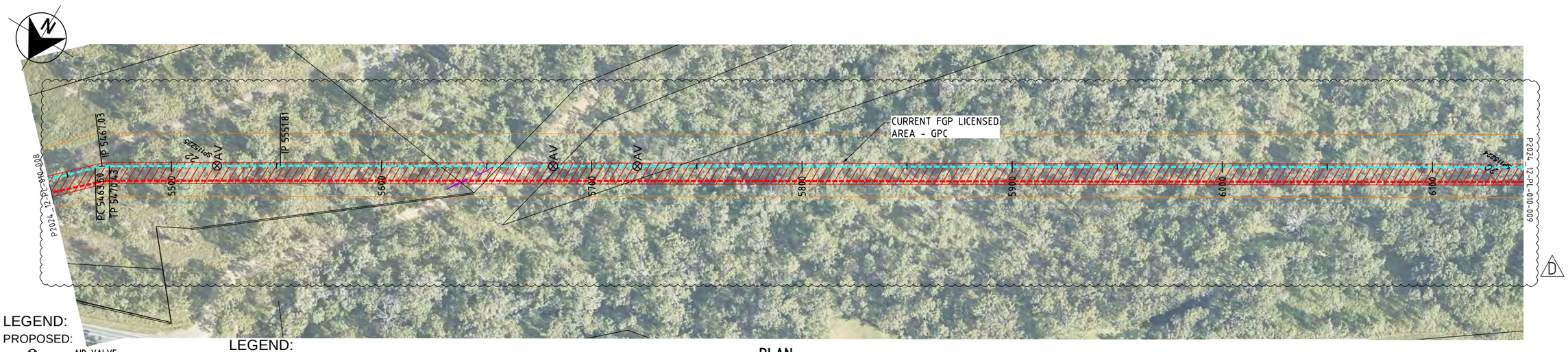
DRAWN BY	ARIEL DUCUSIN	19/10/24
DESIGNED BY	MICHAEL MARIES	19/10/24
REVIEWED BY	PETER SEMIANIW	19/10/24
ACCEPTANCE BY		
RPEQ APPROVAL		
GAWB ACCEPTANCE		

EAST END PIPELINE - TREATED WATER ALT ALIGNMENT
PLAN AND LONGITUDINAL SECTION

P2024__12-PL-010-007

PROJECT No.	SIZE	DRAWING No.	SCALE	REV
GAWB #	A3	XXX-X-XXXX	AS NOTED	E

BEFORE YOU DIG
www.byda.com.au
Zero Damage - Zero Harm



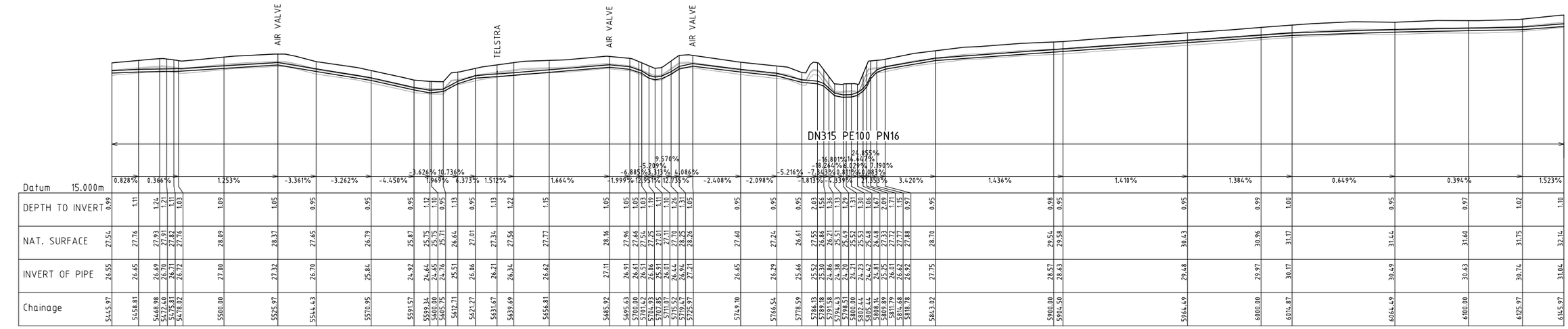
D

LEGEND:
PROPOSED:
- AIR VALVE
- SCOUR VALVE
- ISOLATION VALVE
- CONTROL VALVE
- SWABBING POINT
- TREATED WATER PIPELINE (STAGE 1)
- TRENCHLESS INSTALLATION
- TREATED WATER ALT ALIGNMENT
- FGP ALIGNMENT
- FUTURE RAW WATER PIPELINE

LEGEND:
EXISTING:
- FENCE
- GAS
- ELECT'L POWER (OH or UG)
- TELSTRA CABLE
- DRAIN
- STORM WATER
- WATER OTHER
- SEWER PIPE
- LANDFILL GENERAL WASTE
- SLURRY
- RIGHT OF WAY
- DCDB

PLAN

0 20 40 60 80 100
SCALE OF METRES 1:2000 @ A3



LONGITUDINAL SECTION

4 0 4 8 12 16 20
VERTICAL SCALE OF METRES 1:400 @ A3

20 0 20 40 60 80 100
HORIZONTAL SCALE OF METRES 1:2000 @ A3

REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND
NAME:
RPEQ NO.:
DIVISION:
SIGNATURE: _____ DATE: _/_/_

ISSUED FOR TENDER
NOT TO BE USED FOR CONSTRUCTION PURPOSES

COMPASS ASSURANCE SERVICES ISO 9001

REV	DATE	REVISION DESCRIPTION	DRN	CHKD	EXT. APP.	GAWB ACC.	REFERENCE DRAWINGS	NUMBER
							-	
							-	
							-	
							-	
D	16/07/25	ALIGNMENT UPDATED	VE	MM	PS		-	
C	14/03/25	MATERIAL & LEGEND UPDATED	VE	MM	PS		-	
B	23/11/24	ISSUED FOR TENDER	AD	MM	PS		-	
A	29/10/24	PRELIMINARY DESIGN ISSUED FOR REVIEW	AD	MM	PS		-	

W3 Plus Consulting
world wide water plus

DO NOT SCALE

INITIALS SHOWING (●) ASTERISK INDICATE ORIGINAL SIGNATURE HAS BEEN SIGNED OFF AS PER DATE INDICATED

Gladstone Area Water Board
136 Goondoon Street Gladstone Q 4680 | PO Box 466 Gladstone Q 4680 | Tel: (07) 4976 3000 | ABN: 88 449 667 181

DRAWN BY	ARIEL DUCUSIN	19/10/24
DESIGNED BY	MICHAEL MARIES	19/10/24
REVIEWED BY	PETER SEMIANIW	19/10/24
ACCEPTANCE BY		
RPEQ APPROVAL		
GAWB ACCEPTANCE		

EAST END PIPELINE - TREATED WATER ALT ALIGNMENT
PLAN AND LONGITUDINAL SECTION

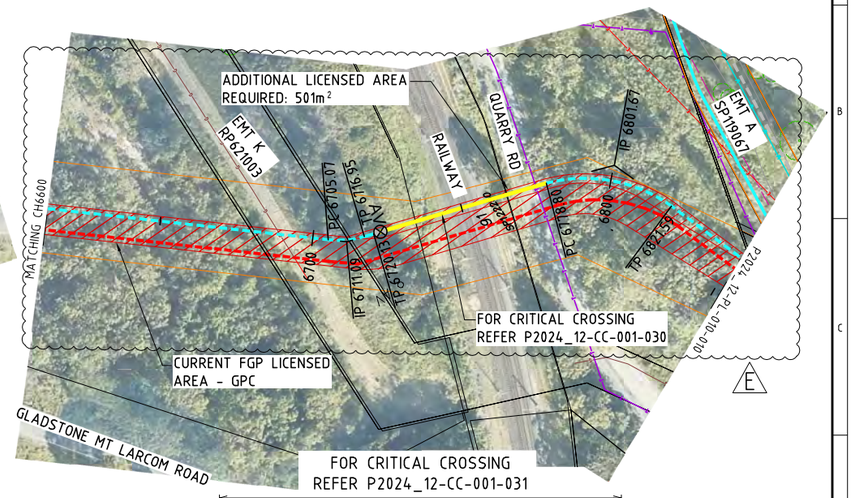
P2024_12-PL-010-008

PROJECT No.	SIZE	DRAWING No.	SCALE	REV
GAWB #	A3	XXX-X-XXXX	AS NOTED	D

BEFORE YOU DIG www.byda.com.au
Zero Damage - Zero Harm

PLAN

0 20 40 60 80 100
SCALE OF METRES 1:2000 @ A3



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- ISOLATION VALVE
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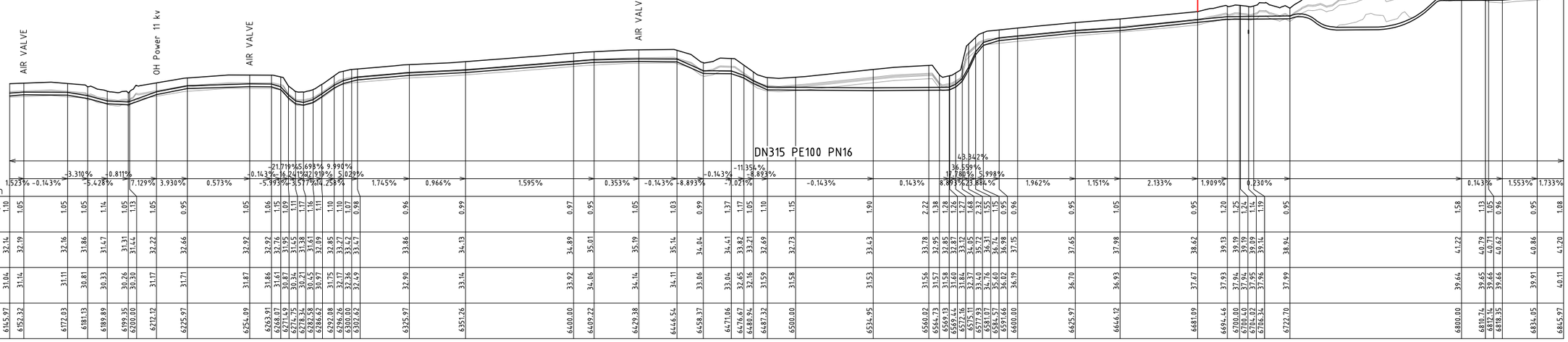
- TRENCHLESS INSTALLATION
- TREATED WATER ALT ALIGNMENT
- FGP ALIGNMENT
- FUTURE RAW WATER PIPELINE

LEGEND:

EXISTING:

- FENCE
- GAS
- ELECT'L POWER (OH or UG)
- TELSTRA CABLE
- DRAIN
- STORM WATER
- WATER OTHER
- SEWER PIPE
- LANDFILL GENERAL WASTE
- SLURRY
- RIGHT OF WAY
- DCDB



LONGITUDINAL SECTION

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VERTICAL SCALE OF METRES 1:400 @ A3

20 0 20 40 60 80 100
HORIZONTAL SCALE OF METRES 1:2000 @ A3

REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND
NAME:
RPEQ NO.:
DIVISION:
SIGNATURE: _____ DATE: -/-/-

ISSUED FOR TENDER
NOT TO BE USED FOR CONSTRUCTION PURPOSES

REV	DATE	REVISION DESCRIPTION	DRN	CHKD	EXT. APP.	GAWB ACC.	REFERENCE DRAWINGS	NUMBER
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E	16/07/25	ALIGNMENT UPDATED	VE	MM	PS		-	
D	14/03/25	MATERIAL & LEGEND UPDATED	VE	MM	PS		-	
C	05/12/24	CC REFERENCE UPDATED	AD	MM	PS		-	
B	23/11/24	ISSUED FOR TENDER	AD	MM	PS		-	
A	29/10/24	PRELIMINARY DESIGN ISSUED FOR REVIEW	AD	MM	PS		-	

W3 Plus Consulting
world wide water plus

DO NOT SCALE

INITIALS SHOWING (a) ASTERISK INDICATE ORIGINAL SIGNATURE HAS BEEN SIGNED OFF AS PER DATE INDICATED

Gladstone Area Water Board
136 Goondoon Street Gladstone Q 4680 | PO Box 466 Gladstone Q 4680 | Tel: (07) 4976 3000 | ABN: 88 489 667 181

DRAWN BY	ARIEL DUCUSIN	19/10/24
DESIGNED BY	MICHAEL MARIES	19/10/24
REVIEWED BY	PETER SEMIANIW	19/10/24
ACCEPTANCE BY		
RPEQ APPROVAL		
GAWB ACCEPTANCE		

EAST END PIPELINE - TREATED WATER ALT ALIGNMENT
PLAN AND LONGITUDINAL SECTION

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PROJECT No.	SIZE	DRAWING No.	SCALE	REV
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BEFORE YOU DIG
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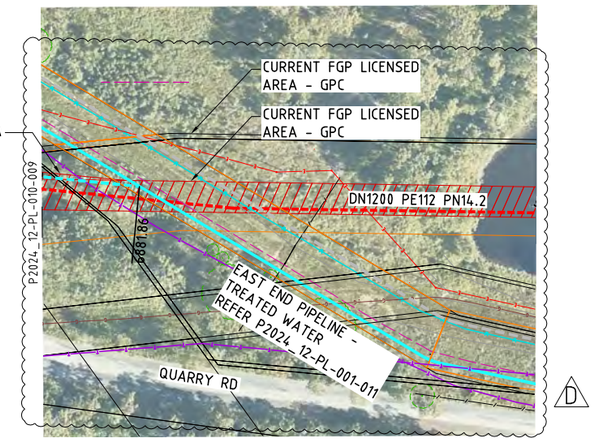
Zero Damage - Zero Harm



PLAN

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SCALE OF METRES 1:2000 @ A3

LEGEND:

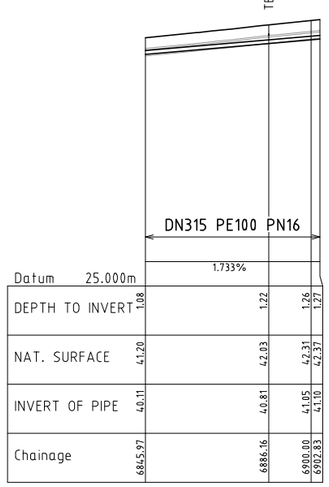
PROPOSED:

- AIR VALVE
- SCOUR VALVE
- ISOLATION VALVE
- CONTROL VALVE
- SWABBING POINT
- TREATED WATER PIPELINE (STAGE 1)
- TRENCHLESS INSTALLATION
- TREATED WATER ALT ALIGNMENT
- FGP ALIGNMENT
- FUTURE RAW WATER PIPELINE

LEGEND:

EXISTING:

- FENCE
- GAS
- ELECT'L POWER (OH or UG)
- TELSTRA CABLE
- DRAIN
- STORM WATER
- WATER OTHER
- SEWER PIPE
- LANDFILL GENERAL WASTE
- SLURRY
- RIGHT OF WAY
- DCDB



LONGITUDINAL SECTION

4 0 4 8 12 16 20 — VERTICAL SCALE OF METRES 1:400 @ A3

20 0 20 40 60 80 100 — HORIZONTAL SCALE OF METRES 1:2000 @ A3

COMPASS ASSURANCE SERVICES ISO 9001

REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND
NAME:
RPEQ NO.:
DIVISION:
SIGNATURE: _____ DATE: _ / _ / _

ISSUED FOR TENDER
NOT TO BE USED FOR CONSTRUCTION PURPOSES

REV	DATE	REVISION DESCRIPTION	DRN	CHKD	EXT. APP.	GAWB ACC.	REFERENCE DRAWINGS	NUMBER
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C	14/03/25	MATERIAL & LEGEND UPDATED	VE	MM	PS		-	
B	23/11/24	ISSUED FOR TENDER	AD	MM	PS		-	
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RPEQ APPROVAL		
GAWB ACCEPTANCE		

EAST END PIPELINE - TREATED WATER ALT ALIGNMENT
PLAN AND LONGITUDINAL SECTION

P2024_12-PL-010-010

PROJECT No.	SIZE	DRAWING No.	SCALE	REV
GAWB #	A3	XXX-X-XXXX	AS NOTED	D

11.4 Appendix D – Ecological Assessment

CHAPTER 6

GLADSTONE – FITZROY
PIPELINE PROJECT
Environmental Impact Statement

Terrestrial Flora

Gladstone Area Water Board

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6. Terrestrial Flora

6.1 Matters of National Environmental Significance

6.1.1 Introduction

Appendix G describes the likely significant impacts of the Gladstone-Fitzroy Pipeline project (the project) on matters of National Environmental Significance (NES) as defined in the *Environment Protection Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

There is one matter of NES that functions as a controlling provision for this action. This is the controlling provision on listed Threatened species and communities (EPBC Act, Sections 18 and 18a). Hence, the Terms of Reference (ToR) for the EIS require that information be provided specifically on Threatened species and Ecological Communities.

The assessment of potential impact to EPBC Act listed Threatened species and Ecological Communities has been undertaken through desktop research and detailed fieldwork. The chapters of the EIS that address these matters are Chapter 6, Terrestrial Flora; Chapter 7, Terrestrial Fauna; and Chapter 8, Aquatic Flora and Fauna. The findings of these chapters are summarised in the summary of Appendix G and Appendix G itself. Existing information regarding the terrestrial fauna of the project area and surrounding area was collated and reviewed. The findings of the desktop assessments indicated that a number of species of conservation significance may use habitats of the project area and surrounding lands. Consequently, consideration was given to these species (termed target species) in the design and implementation of the field survey program and habitat assessments. The review of existing information assisted in prioritising the variety of habitats and locations for field surveys.

The field study methodology for terrestrial fauna, flora and aquatic flora and fauna are further explained in Appendix G, Sections 4, 5 and 6. These sections also include existing information reviews, information on target species, the field survey program and the assumptions and limitations of the associated field study.

6.1.2 Description of the Affected Environment Relevant to the Controlling Provisions

This section describes the EPBC Act listed Threatened species and Threatened Ecological Communities that have been identified as potentially occurring within the project area. The section is divided into EPBC Act listed threatened fauna (see Appendix G.6.1), and also into EPBC Act listed threatened flora and Threatened Ecological Communities (see Appendix G.6.2). These species, with relevant conservation status and notes on habitat and distribution are provided in Table 3 of Appendix G. The list of EPBC Act listed Threatened fauna derived from review of existing information (including an EPBC Act Protected Matters database search) found three Endangered terrestrial species, 12 Vulnerable terrestrial species and one Critically Endangered terrestrial species. Four Vulnerable aquatic species and two Endangered aquatic species were also found.

The field survey results revealed the following:

Fitzroy to Bajool

The recorded assemblage comprised two EPBC Act listed Threatened fauna species:

- The Squatter Pigeon (sth. subsp.) (*Geophaps scripta scripta*), which is listed as Vulnerable
- The Ornamental Snake (*Denisonia maculata*), which is also listed as Vulnerable.

Bajool to Gladstone

The recorded assemblage comprised two EPBC Act listed Threatened fauna species:

- The Yellow Chat (*Epthianura crocea macgregori*), which is Critically Endangered
- The Squatter Pigeon (sth. subsp.) (*Geophaps scripta scripta*), which is Vulnerable.

6.1.3 Aquatic Fauna and Flora Habitat Values for EPBC Act Listed Species

A review of the EPBC Protected Matters Report (DEWHA 2007) and the Wildlife Online (EPA 2007) database for aquatic macrophyte species of conservation significance identified no EPBC Act listed Threatened species occurring, or likely to occur within the project area.

In terms of aquatic fauna, in Fitzroy to Bajool, the Fitzroy River site represents the largest waterbody within the project area, and has a number of inherent functional ecological values, including a potential habitat for the Fitzroy River Turtle, classified as Vulnerable. In addition, several off-stream lagoons (oxbow lakes) and ephemeral streams occur within the project area. It is unlikely that the lagoons and streams within the project area support habitat for EPBC Act listed Threatened aquatic fauna species due to their small size, absence of optimal habitat for these species, and historical (clearing) and ongoing pressures from adjacent catchment land uses.

In Bajool to Gladstone, the only listed marine fauna species that could potentially occur within the project area is the Saltwater Crocodile (*Crocodylus porosus*); however this is listed as Migratory and not as Threatened under the EPBC Act (therefore impacts upon this species is outside of the scope of this report. Nonetheless, an impact assessment concerning the species is provided in Chapter 8, Aquatic Flora and Fauna).

6.1.4 Threatened Terrestrial Flora and Threatened Ecological Communities

A search of the Wildlife Online database (EPA 2007a) for species that are simultaneously listed under the EPBC Act returned a list of 13 plant species (See Table 8 of Appendix G and Section G.6.2 for more information). An EPBC Act Protected Matters Report (DEWHA 2007) was generated from a similar search, but with a more narrowly defined search area (search area and results from original extract are shown in Appendix E2) and returned a list of 11 plant species and their conservation status (nine Vulnerable and two Endangered, as shown in Table 8). Five species were reported that did not occur on the Wildlife Online list, indicating that these species are expected to occur, but have not been recorded in the search area. For these species, refer to the last four entries in Table 8 of Appendix G.

No targeted EPBC Act listed Threatened plant species were observed during survey in either section of the corridor. However, one non-target species was observed, although it was a sterile specimen and absolute confirmation of identification was not possible. This was a Vulnerable species (listed under the EPBC Act), and was one individual of (probably) ooline (*Cadellia pentastylis*) found at Detailed Site 14 (Marble Creek) (see Figure 6.1).

Several EPBC Act referral triggers were identified from preliminary data. Those triggers, based on likelihood of occurrence from habitat and distribution data, were:

- The presence of "semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar bioregions" (referred to as scrub), as defined in the EPBC Act Protected Matters Report as Threatened Ecological Communities
- A 200 m stretch of low-growing Brigalow (*Acacia harpophylla*) with extensive gilgai (a high density of small waterholes or pools, each ranging from about 5 m to 10 m in diameter) was observed on the south side of Inkerman Creek on Lot 68 DS141. This patch of vegetation occurred between the tidal interface of Inkerman Creek, and the taller Brigalow further east towards the Toonda Port Alma Road. Brigalow (*Acacia harpophylla*) is a Threatened Ecological Community under the EPBC Act. However, the height of the community on-site averaged approximately 3 m, which does not meet the structural requirements for the definition of remnant Brigalow (11 to 15 m) under the Vegetation Management Act 1999 (VM Act), and the EPBC Act uses the structural classification of the VM Act (in this case Regional Ecosystem 11.3.1 or 11.4.3)

Whilst Brigalow (*Acacia harpophylla*) regrowth may occur immediately south of Inkerman Creek, it constitutes a Threatened Ecological Community under the EPBC Act (if of sufficient structure), but the species as an individual is not listed as Threatened under the Act.

Two species of tree cycads (*Cycas megacarpa and C. ophiolitica*) are known to occur in areas that may be intersected by the proposed corridor. They are Endangered under the EPBC Act, and could be impacted through removal and/or disturbance of vegetation. Scrub species could potentially be impacted along this section of the corridor, through removal and/or disturbance of vegetation.

6.1.5 Assessment of Impacts on NES Matters and Mitigation Measures

6.1.5.1 Terrestrial Threatened Fauna

6.1.5.1.1 Potential Impacts

The alignment of the Gladstone-Fitzroy Pipeline was selected to minimise impact to native fauna habitats. Potential impacts include:

- Vegetation clearing and habitat disturbance
- Habitat fragmentation and disturbance to wildlife movement corridors
- Disturbance to wetlands and waterways
- Trench fall (entrapment of fauna within open trenches during construction)
- Creation of environments favourable to the colonisation and expansion of environmental weeds and pest animals.

These are further explained in Section G.7.1.1 in Appendix G.

More specifically, the primary potential impacts on EPBC species include loss of shelter and food resources, loss of breeding sites, trench fall (primarily herpetofauna) and possibly increased predation (primarily small ground mammals and birds) resulting from:

- Clearing of remnant vegetation and riparian communities
- Removal of habitat trees, especially mature hollow-bearing trees
- Removal of ground debris in the construction of the pipeline;
- Trenching operations
- Increased ease of access for introduced predators.

6.1.5.1.2 Mitigation

Table 10 in Appendix G provides a summary of occurrence status and potential impacts and mitigation responses for EPBC Act listed Threatened fauna that are known to occur, or have the potential to occur, within habitats of the project area and/or land immediately adjacent.

The assessment of potential impacts to these values has generated an extensive suite of mitigation measures for the project in keeping with best management practices (see, Chapter 20, Planning Environmental Management Plan). With the successful implementation of the recommended mitigation measures, it is considered that the impact of the project on EPBC Act listed Threatened fauna will be relatively low in significance.

6.1.5.1.3 Residual impact and Significance Criteria classification

As described in Appendix G, the majority of the project area is highly disturbed. For these largely cleared and grazed lands, the implementation of the mitigation strategies outlined above will result in the project creating a negligible residual impact on EPBC Act listed Threatened fauna species (see Table 14 of Appendix G). However, due to the impact upon the key locations (see Section G.7.1.2), the residual impact upon EPBC Act listed Threatened fauna species is considered minor adverse.

6.1.5.2 Aquatic Fauna and Flora

6.1.5.2.1 Potential Impacts

Potential impacts to EPBC Act listed Threatened aquatic flora, fauna and their habitat resulting from the construction and operation phases of the Gladstone-Fitzroy Pipeline project are:

Construction phase:

- Vegetation clearing and channel disturbance
- Water quality modifications (due to changes in turbidity and the mobilisation of organic sediments, Acid Sulfate Soils (ASS) and other toxicants)
- Creation of in-stream barriers (i.e. culverts).

Operational phase:

- Alterations to habitat, both surrounding the intake pipe and within the Fitzroy River weir pool
- Translocation of exotic species, especially the noxious Water Hyacinth* (*Eichhornia crassipes*) from the Fitzroy River
- Water treatment plant (WTP) operational impacts.

6.1.5.2.2 Mitigation

Due to the low probability of occurrence of EPBC Act listed Threatened aquatic flora and fauna species within the project area, significant impacts to listed Threatened species are considered unlikely. Despite this, mitigation measures will still be implemented for non-EPBC Act listed species. These mitigation measures cover impacts on all aquatic flora and fauna (not only EPBC Act species which are listed as Threatened) and hence these can be found in Chapter 8, Aquatic Flora and Fauna.

6.1.5.2.3 Residual impact and Significance Criteria classification

- After mitigation, impacts upon aquatic flora and fauna that are listed under the EPBC Act as Threatened are considered negligible.

6.1.5.3 Threatened Terrestrial Flora and Threatened Ecological Communities

6.1.5.3.1 Potential Impacts

The main potential impacting processes to EPBC Act listed Threatened flora and Threatened Ecological Communities associated with the clearing of the 30 m right-of-way (ROW) and construction of the pipeline are:

- Clearing of vegetation remnants
- Reduction of flora species habitat
- Removal of individual species of significance
- Reduction of wildlife corridor functionality
- Remnant vegetation edge effects
- Riparian vegetation disturbance
- Weed introduction.

Table 15 of Appendix G lists those relevant Ecological Communities which are classified as Endangered under the EPBC Act and responses to the Significant Impact Criteria as described within the EPBC Act Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance (May 2006). None of the Significant Impact Criteria will be met as a result of the project, but the reduction in area of a low-growing patch of Brigalow may occur (at Site 9c). The structural form of this patch of Brigalow does not meet the requirements for classification as remnant under the VM Act, nor the EPBC Act, which uses the structural classification of the VM Act.

Partial clearing of the semi-evergreen vine thickets of the Brigalow Belth (North and South) and Nandewar bioregions at Short Site 4 (see Figure 6.1 of the EIS) would only occur if the right-of-way were extended across existing road. If the corridor is located on the other side of the road, and this is the current intention, then no scrub will need to be cleared.

In addition, it is unlikely that EPBC Act listed Threatened species will be encountered along the corridor, during removal and/or disturbance of vegetation with the possible exception of ooline (*Cadellia pentastylis*). Table 16 of Appendix G shows that none of the Significant Impact Criteria (under the EPBC Act) will be met for EPBC Act listed flora species as a result of the project.

6.1.5.3.2 Mitigation

While it is considered unlikely that EPBC Act listed Threatened species and Ecological Communities along the corridor will be impacted by the proposed project, pre-construction surveys will be conducted.

When any EPBC Act listed Threatened individuals remain within the construction footprint, these can be translocated (or replacements planted, depending on species).

6.1.5.3.3 Residual impact and Significance Criteria classification

The construction of the pipeline and clearing of the ROW is likely to have an overall **negligible to minor** adverse impact to EPBC Act listed Threatened flora and Ecological Communities.

6.1.6 Matters of NES Summary

For EPBC Act listed fauna, the assessment of potential impacts to these values has generated an extensive suite of mitigation measures for the project in keeping with best management practices (see, Chapter 20, Planning Environmental Management Plan). With the successful implementation of the recommended mitigation measures, it is considered that the impact of the project on EPBC Act listed Threatened fauna will be relatively low in significance.

The construction of the pipeline and clearing of the ROW is likely to have an overall **negligible** to **minor adverse** impact to (aquatic and terrestrial) EPBC Act listed Threatened flora and ecological communities. Prior to construction, a trained ecologist will identify areas within the corridor where negative impacts on flora communities (in general) and EPBC Act listed Threatened species are possible. This information will be documented in the Construction Environmental Management Plan (CEMP).

6.2 Terrestrial Flora

6.2.1 Background

This chapter constitutes the terrestrial flora component for the EIS for the project.

The study of terrestrial flora investigated the vegetation communities classified as Regional Ecosystems (REs) by the Environmental Protection Agency (EPA) 2007 and Threatened species (as defined under relevant legislation) along the proposed pipeline corridor, which are likely to be impacted by the project. The corridor considered is on average approximately 100 m wide. The ROW for the project is approximately 30 m wide (within the corridor), and vegetation is likely to be completely cleared in this area. Impacts on Threatened Species were assessed for the ROW, with consideration of possible edge effects on Threatened species within 100 m either side of the corridor (i.e. a total width of assessment of approximately 300 m). Impacts on vegetation communities were considered on a broader scale, to account for the effects of fragmentation. In this case the distance assessed from the corridor was highly variable, depending on existing remnant vegetation surrounding the corridor.

In all cases a minimum buffer distance of 100 m either side of the corridor was taken into consideration when assessing impacts, but remnant vegetation corridors were also taken into consideration, and these corridors can extend many kilometres away from the pipeline corridor.

The impacts on terrestrial flora were considered in conjunction with the related indirect effects on other factors including aquatic ecology, fauna, soils and cultural values. The most significant relationships were those of:

- Dependence of aquatic ecology stability on riverine vegetation
- Dependence of terrestrial fauna on terrestrial flora habitat
- Dependence of particular fauna species on particular plant species (not necessarily Threatened plant species)
- Dependence of soil stability on intact terrestrial vegetation
- Dependence of modern and traditional cultures on remnant vegetation and plant species.

The study also considered weed issues in the project area, to avoid exacerbating problems particularly with Parthenium (*Parthenium hysterophorus*) around the northern end of the corridor, and Giant Rats-tail Grass (a number of *Sporobolus* spp.) around the southern end of the corridor.

6.2.2 Aims

The aims of the study were to provide:

- A detailed assessment of the conservation values of terrestrial vegetation within and directly adjacent to the proposed corridor
- An assessment of Threatened species known or potentially occurring within the project area, including species listed under the EPBC Act and Queensland's *Nature Conservation Act 1992, (*NC Act*)*
- An assessment of Threatened Ecological Communities known or potentially occurring within the project area, listed under the EPBC Act. See Chapter 6, Section 6.1 for a summary and Appendix G for a full assessment specifically dealing with the project's relevant matters of NES (Threatened species and Ecological Communities) under the EPBC Act
- An assessment of Endangered and Of Concern REs known or potentially occurring within the project area, listed under the VM Act
- An identification of significant habitats within the study area
- Mitigation measures proposed in response to potential impacts.

Specifically, the information required is stipulated in the ToR issued by the Queensland Government Coordinator-General, included in Appendix A.

6.3 Methodology

6.3.1 Nomenclature and Terminology

In this chapter, project area refers to lands and waterways within the project corridor, which runs from the Fitzroy River in the north to the Gladstone State Development Area (GSDA) in the south as shown in Figure 1.3. The average width of the corridor investigated is approximately 100 m. The ROW is generally 30 m wide passage within the corridor that is likely to be substantially cleared for the construction and operation of the pipeline, its associated infrastructure, and access. The term *surrounding area* refers generally to the lands within 2 km of the project area. The project area is considered in two sections - the northern section is referred to as the *Fitzroy to Bajool* section, and the southern section as the *Bajool to Gladstone* section.

In this chapter, the conservation status of a species may be described as *Endangered*, *Vulnerable*, *Rare*, *Culturally Significant* or *Common*. These terms are used in accordance with the provisions of the *Nature Conservation Act 1992* (Qld) (NC Act) and its amendments[1], and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). *Threatened* is used in this chapter to collectively describe Endangered and Vulnerable species.

This chapter describes the potential impacts of the project on *remnant vegetation* as defined under the *Vegetation Management Act 1999* (Qld) (VM Act). The VM Act and the presence of RE provide the legislative framework for vegetation conservation in Queensland. This occurs through two processes that are administered by the Department of Natural Resources and Water (DNRW) under the VM Act and a process developed by the Queensland Environmental Protection Agency (EPA) and administered under the *Integrated Planning Act 1997* (Qld) (IP Act). The descriptions of conservation status used in this chapter reflect those defined under the VM Act and Regional Ecosystem Description Database (REDD) maintained by the Queensland Herbarium.

Remnant vegetation is that which is defined by RE mapping by the EPA (2005), but also includes vegetation that has not been covered by that mapping process due to reasons of scale or error. The minimum mappable size of a vegetation remnant in coastal areas for RE mapping is 1 ha (EPA 2005a, Section 3.8.1.1 of EPA methodology), and it must meet the height and cover requirements as defined by REDD (EPA 2007b). Unmapped remnant vegetation is recognised as *non-remnant* under the VM Act, but can be incorporated into RE mapping, and converted to remnant, through the *map modification process*, which is administered by DNRW.

[1] For the purposes of this chapter, relevant NC Act regulations and amendments refer to the Nature Conservation (Wildlife) Regulation 1994 and reprinted as in force on 8 March 2004 (including amendments up to 2004 SL No.9).

Botanical names conform to those recognised by the Queensland Herbarium (see Bostock and Holland 2007).

The term *scrub* in this chapter refers to non-eucalypts (i.e. not *Eucalyptus* species) which usually grow in dense communities, and are defined REs, RE 11.11.18 and RE 11.11.5 (EPA 2007b) which are considered as possibly occurring along the corridor (see Table 6.2 for short descriptions of those REs).

The following abbreviations are used in this chapter:

ASS	Acid Sulphate Soils
AVH	Australia's Virtual Herbarium
BAMM	Biodiversity Assessment Mapping Methodology
BPA	Biodiversity Planning Assessment
CEMP	Construction Environmental Management Plan
DEWHA	Australian Department of the Environment, Water, Heritage and the Arts
DIP	Department of Infrastructure and Planning
DNRW	Department of Natural Resources and Water
EMP	Environmental Management Plan
EPA	Queensland Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*
EVR	Endangered, Vulnerable or Rare
GIS	Geographical Information System
GPS	Global Positioning System
GSDA	Gladstone State Development Area
IP Act	*Intergrated Planning Act 1997*
Land Protection Act	*Land Protection (Pest and Stock Route Management) Act 2002*
NC Act	*Nature Conservation Act 1992*
NES	National Environmental Significance
REs	Regional Ecosystems
REDD	Regional Ecosystem Description Database
ROW	Right-of-way
SGIC	Stanwell - Gladstone Infrastructure Corridor
ToR	Terms of Reference
VM Act	*Vegetation Management Act 1999 (Qld)*
Wildlife Online	public internet access to Queensland EPA flora and fauna records

6.3.2 Terms of Reference

Methods followed as closely as possible to those stipulated in the ToR, which are presented in Appendix A.

6.3.3 Review of Existing Information

6.3.3.1 Spatial Data

A number of Geographical Information System (GIS) datasets, including the project corridor, were overlaid on rectified aerial photography. The datasets were:

- Rectified aerial photo mosaic (average age of component photos 2005)
- Cadastre (produced by DNRW)
- RE vegetation mapping by the Queensland Herbarium (Version 5.0 with December 2006 Amendments) (EPA 2005b)
- Biodiversity Planning Assessment (BPA) mapping (Version 3.4 – 7 March 2005) (EPA 2005c).

6.3.3.2 Existing Reports

A number of reports pertaining to the project area and surrounds were assessed for relevance and were used for general background information (see references in Section 6.11).

6.3.3.3 Desktop Review of Mapping

RE mapping (EPA 2005b) was used to locate the larger patches of native vegetation intersected by the corridor. Air-photo interpretation was used to identify any other unmapped patches of native vegetation. Representative remnant REs were sampled along the entire length of the proposed corridor, with the exception of those private properties where access was not granted. Each vegetation remnant shown in RE mapping (EPA 2005b) and intersected by the corridor was sampled in detail at least once. Unmapped remnants of sufficient size or width to be mappable according to Queensland Herbarium mapping methodology (EPA 2005a) were also sampled[2]. This was done to verify the mapping, and to check for targeted Rare or Threatened flora species known to occur in the area.

6.3.3.4 Existing Field Data

Brief site data collected in April 2007 by BMT WBM for a preliminary assessment of the corridor were incorporated into this study and used as the main source of background information. Brief site data included the recording of dominant plant species at each site, and other relevant information such as condition and soil type. Conspicuous

[2] According to Herbarium methodology the remnant size can be as small as 0.25 ha and/or 25 m wide.

Threatened species were also targeted as part of the preliminary assessment. For example, for the Threatened species listed in the EPBC Act, *Cycas* spp. were conspicuous in eucalypt forest during reconnaissance, and *Atalaya* spp. in softwood scrub were also relatively distinctive. Publicly accessible roads were mostly used in this stage of the study, and site data is presented in Appendix E2.

6.3.3.5 Databases

Two publicly accessible databases with restricted locational precision were searched to identify Rare or Threatened flora known to occur, or likely to occur, in the project area and surrounds. Both Rare and Threatened categories are used in the NC Act, and Threatened is used in the EPBC Act. Both searches were done by specifying coordinates (defining a rectangle) that contained the entire project area:

- Wildlife Online – a Queensland EPA internet database accessible to the public which stores records of plant collections (and other groups including algae and fungi) for a search area defined by the user. Rare and Threatened species can be selected from the data. The latest data retrieval was performed on 7 August 2007.
- EPBC Act Protected Matters Report – a DEWHA internet database accessible to the public which lists Rare and Threatened Species for a search area defined by the user. The latest data retrieval was performed on 3 July 2008.

The likelihood of occurrence of individual Threatened flora species (strictly, they are *taxa,* since sub-species levels can apply) was assessed in two ways: firstly whether the species was considered likely to occur within close proximity to the corridor (creating a risk of disturbance); secondly whether the species was considered likely to be consistently associated with one or more of the categories defined by the GIS coverages (e.g. a particular RE on the RE mapping).

6.3.4 Field Investigation

A field survey for Threatened species was done concurrently with a detailed site survey as described below for vegetation community sampling, for which both conspicuous and inconspicuous species were searched. Conspicuous Threatened species were also searched for during the entire course of survey work, particularly during Brief site surveys.

Field surveys were undertaken to assess the following:

- To determine where the mapped remnant vegetation communities would be directly intersected by the corridor, by intensive 50 m x 10 m site surveys in a representative location, identifying structure, condition and usually all species (depending on appropriate level of detail). This data was then used to verify the accuracy of the RE mapping and if necessary, revise the mapping in the adjacent area (i.e. approximately a 200 m radius), by broader reconnaissance and/or air-photo interpretation. Vegetation sampling was done in accordance with Queensland Herbarium vegetation survey methodology (EPA 2005a). Sample types were either:
  - **Detailed** – all plant species present on-site were recorded within a 50 m x 10 m plot, along with structural details such as height and cover. This type of site is consistent with a Queensland Herbarium Secondary site, except stem counts were not included. It is more comprehensive than a Queensland Herbarium Tertiary site, in that all plant species in the plot are recorded. Every RE (each type, not each remnant) which occurred along the corridor was intended to be sampled at least once, so that correct RE allocation for the RE mapping could be verified. Detailed sites were only considered in remnants of good condition, so that structural data and complete species lists were meaningful, and could be applied (extrapolated) to other remnants within the corridor of the same RE
  - **Short** – mid-way between a Detailed site and a Brief site. A short list of the most common species was made of the site but structural details were not formally recorded. Like a Detailed site, a Short site was usually strategically placed, and was often a site that was originally intended to be Detailed. Detailed sites were not done where, on initial field assessment, site conditions indicated that a Detailed site was not necessary or not possible (e.g. due to disturbance such as a selectively thinned canopy, or weed infestation). A Short site was also used to confirm an RE when a Detailed site had been done in a nearby remnant of the same RE, especially to consolidate a detailed species list for the local variation of any particular RE
  - **Brief** – only the dominant and indicator plant species present on-site were recorded. This type of site is consistent with a Queensland Herbarium Quaternary site, but some Brief sites were extended species lists similar to a Short site. The data were usually recorded without leaving the vehicle. Brief sites were done to confirm RE mapping, and get an overview of the project area. Brief sites were essential for checking mapped RE polygons.

- To visually check for the presence of Rare or Threatened flora as identified by relevant legislation, which may have been identified as occurring somewhere in the area of the proposed corridor. Any Rare or Threatened species seen *ad hoc* during the vegetation survey were also recorded
- To visually check for small remnants of vegetation which may not feature on the RE mapping due to error or scale, and to assess the value of those remnants based on any or all of the criteria in these methods. These unmapped remnants included stands of trees, or other communities (including grasslands and wetlands) and significant trees (e.g. old growth).

Photographs were taken of each site to illustrate vegetation structure (see Appendix E2), and the position was recorded, where possible, with a hand-held Global Positioning System (GPS). Flora species unable to be identified in the field were collected for later identification. Individual unknown plants were not collected if whole plant removal was required, and instead, close-up photographs and descriptions were taken, along with highly specific location information for return to site if necessary. Public roads and reserves were used to visit all possible publicly accessible sampling points along the corridor, and relevant areas adjacent to the corridor. When areas of interest were on private property, sampling was conducted where permission was granted by landowners.

The location of each sample site is shown overlaid on the RE mapping in Figure 6.1. Sites are identified by arbitrary numerical allocation, in order (north to south) along the corridor, but with subsequent additions of alphabetical characters to allow for insertion of new sites. Some site numbers have been omitted, indicating that a proposed site was subsequently considered redundant or unnecessary, in light of further information becoming available (e.g. a revision of the proposed corridor alignment).

6.4 Assumptions and Limitations

Preliminary site surveys using Brief site observations were done in April 2007, with subsequent Detailed site surveys conducted from 27 August to 7 September 2007. There was little rainfall before and during surveys resulting in drought conditions throughout the project area. Rainfall events in the catchment in February 2008 are likely to have had a positive impact on ground layer flora, but it is not expected that any additional Rare or Threatened species would establish following the rain.

RE mapping (EPA, 2005b) in the project area is relatively coarse and suitable for general planning only. It is not suitable for precise location of infrastructure, and errors of tens or hundreds of metres can occur. The exact extent of some existing vegetation communities is still uncertain due to the age of the aerial photography used in the study. Sources of error that may cause planning problems are:

- **Scale** – base mapping relies on satellite images in many areas and this is coarser than the aerial photography
- **Time lapse** – a considerable amount of clearing or disturbance can occur between the time the remote sensing was done and when the planning begins
- **Remote sensing interpretation error** – this can lead to incorrect REs being applied to vegetation types (due to inability to access ground-truthing areas)
- **Local variation in vegetation type** – this can render RE classification too coarse to be correct. Sub-REs are developed for this purpose but they are being continually developed.

It was assumed for the purposes of the EIS that the ROW for the project is generally 30 m wide, but can be reduced in sensitive areas.

6.5 Relevant Legislation and Policy

The Queensland and Commonwealth statutes, regulations and policies relevant to this chapter are:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – this Act protects Threatened Species at the Federal level
- Queensland *Nature Conservation Act 1992* (NC Act) (and Regulations and Conservation Plans) – this Act protects Threatened Species at the State level
- Queensland *Vegetation Management Act 1999* (VM Act) – this Act protects vegetation from unauthorised clearing (i.e. it focuses on plant communities, not individual plants)
- Queensland *Integrated Planning Act 1997* (IP Act) – this Act coordinates the various Acts described here with other legislation, particularly local government planning schemes
- Queensland *Land Protection (Pest and Stock Route Management) Act 2002 and Regulation 2003* – the Act and Regulation define noxious weeds, which are formally referred to in the Act as Declared Pest Plants.

6.6 Baseline

6.6.1 Background

6.6.1.1 Regional Ecosystems

The project area is located within the Brigalow Belt South and Southeast Queensland bioregions. A bioregion is an area of land that is dominated by similar broad landscape patterns that reflect major structural geologies and climate, as well as major changes in floristic and faunal assemblages (adapted from Sattler and Williams 1999).

The southeastern end of the project area (east of Yarwun) is within the Southeast Queensland bioregion, and this area is characterised by part of the Great Dividing Range, and hilly country with eucalypt forest (but with Poplar Box (*Eucalyptus populnea*) notably absent). The northwestern part of the project area is within the Brigalow Belt South bioregion, and is characterised by flatter, undulating country, with less eucalypt forest (but notably with Poplar Box), and more clay plains, sometimes with Brigalow (*Acacia harpophylla*).

The Fitzroy to Bajool section is located entirely within the Brigalow Belt South bioregion, whereas the Bajool to Gladstone section of the project area is situated within both bioregions. These bioregions represent two of the 13 biogeographical regions (i.e. bioregions) located within Queensland (Sattler and Williams 1999). Other bioregions, for comparison, include the Mulga Lands in Southwest Queensland, Mitchell Grass Downs in Central West Queensland and the Wet Tropics around Cairns.

Remnant vegetation in Queensland is mapped by the EPA (2005b) using REs. These are defined by Sattler and Williams (1999) as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Each RE is defined by a three-number code:

- The first number defines the bioregion. In the Brigalow Belt South bioregion the bioregional number is 11. In the Southeast Queensland bioregion the bioregional number is 12
- The second number defines the Land Zone, which is based on geology, landform and/or soil. Land Zones of Queensland are shown in Table 6.1. Note that in Southeast Queensland, Land Zones 9 and 10 are combined (as "9/10" or "9-10") because of their similarity
- The third number is a unique identifier for the RE, and sometimes there is also a sub-RE identified by a letter of the alphabet. Examples of REs include 11.3.4 and 12.9-10.17b.

The REDD (EPA 2007b) is an internet-based list of REs, with descriptions that are continually updated, and explanations of the RE classification system, including bioregions, land zones, and the individual REs.

6.6.1.2 Links Between Terrestrial Vegetation, and Fauna and Aquatic Flora

Remnant terrestrial vegetation provides habitat for fauna, so the assessment of terrestrial vegetation is able to provide an indication of fauna habitat value. Refer to Chapter 7, Terrestrial Fauna, for those assessments.

Remnant riparian vegetation provides habitat protection for aquatic flora and fauna, through processes such as shading, erosion control and stream flow regulation. Refer to Chapter 8, Aquatic Flora and Fauna, for assessment of those processes.

6.6.2 Remnant Vegetation Communities

6.6.2.1 General

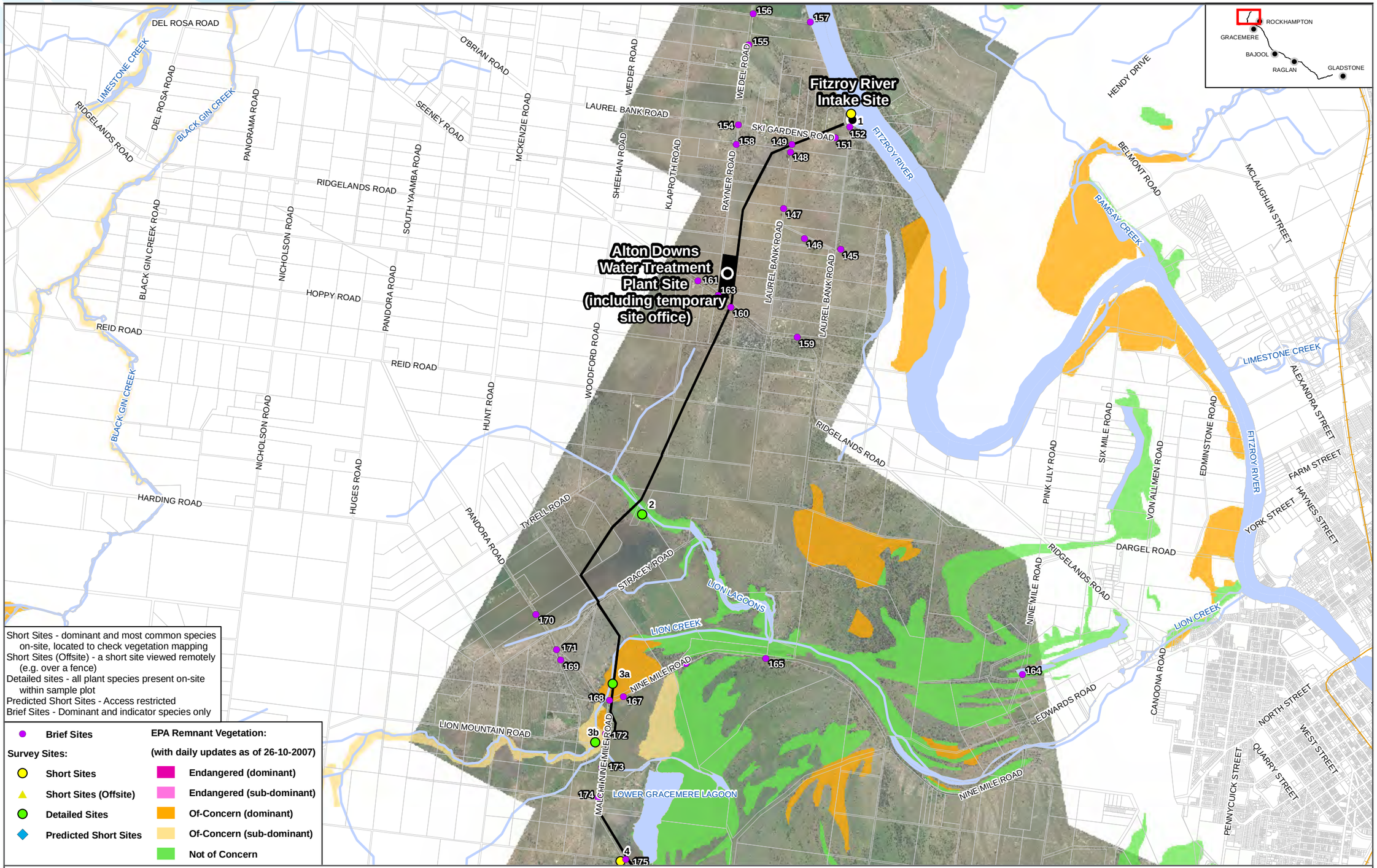
General Condition of Vegetation

Extended drought conditions in the region at the time of field surveys caused what was perceived to be a relative paucity of terrestrial flora species in the lower stratum (the ground layer). As such, it is likely that the full species composition of many terrestrial vegetation communities was not recorded. Upper strata (trees and shrubs) did not appear to be adversely affected by drought. It is likely that recent rain and flooding in the region will have had a positive impact on ground layer flora. However it is not expected that any additional Rare or Threatened Species would establish following the rain, and would not significantly alter the baseline terrestrial flora values as outlined in this chapter.

Scrub Areas Along the Full Length of the Corridor

Softwood scrub is a collective term for non-eucalypt species which are often diverse, and sometimes regarded as "dry rainforest". Some types of softwood scrub in this area are classified as "semi-evergreen vine thicket", but *scrub* (or *softwood scrub*) will be used hereon as a collective term. Scrub in the study area is defined mainly by the RE 11.11.18, as this defines lowland scrub on metamorphic sediments. Scrub in the project area was not necessarily restricted to this RE, depending on geological substrate and species assemblage.

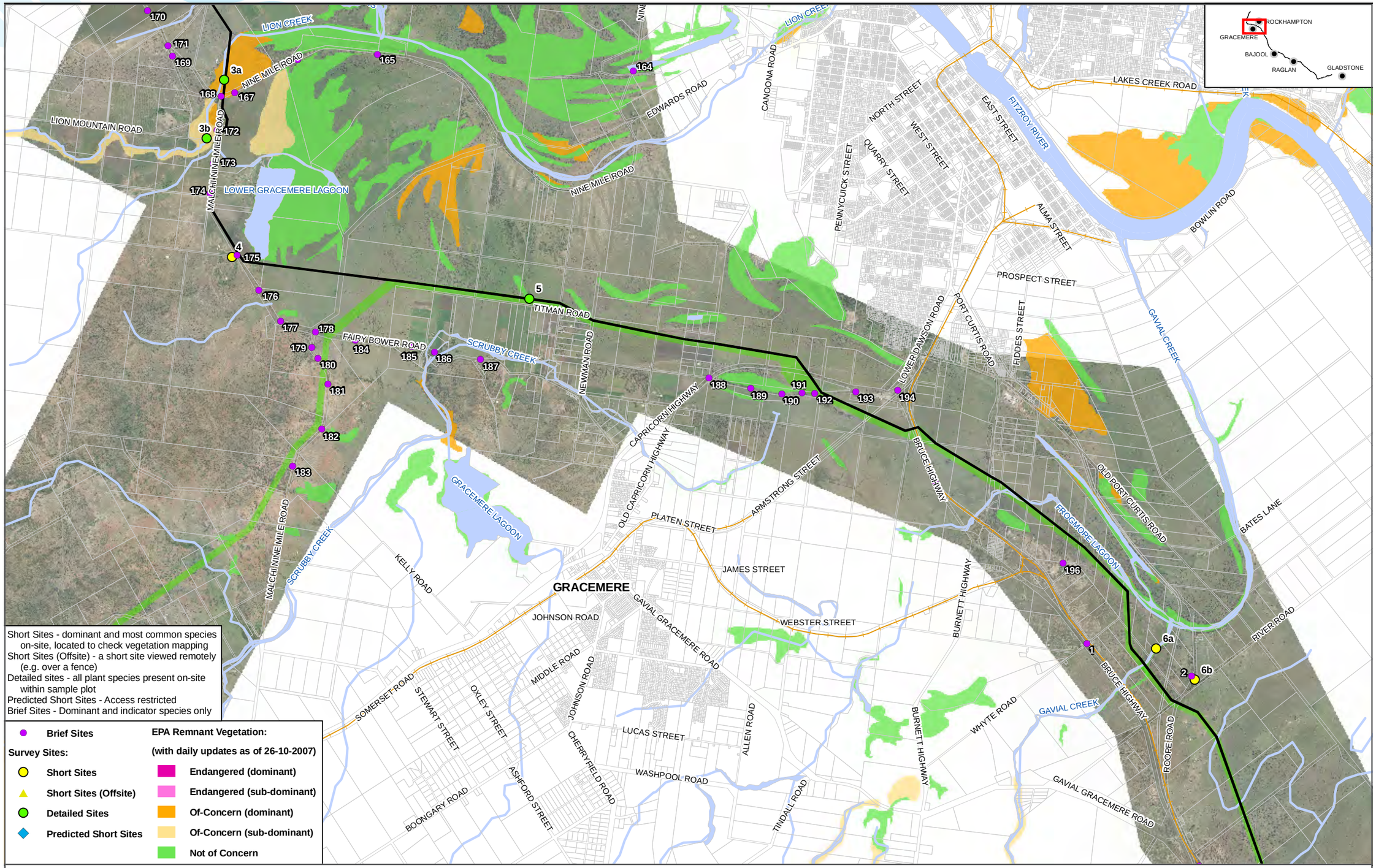
Scrub occurred in patches, along (or near) the corridor. Notable localities included the "Hillview" property in the Gracemere area, Twelve Mile Creek and Marble Creek. These patches were sampled as Sites 4, 13 and 14 respectively, and are discussed further in this section.



Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 1 of 8



Short Sites - dominant and most common species on-site, located to check vegetation mapping
Short Sites (Offsite) - a short site viewed remotely (e.g. over a fence)
Detailed sites - all plant species present on-site within sample plot
Predicted Short Sites - Access restricted
Brief Sites - Dominant and indicator species only

Brief Sites

Survey Sites:

- **Short Sites**
- **Short Sites (Offsite)**
- **Detailed Sites**
- **Predicted Short Sites**

EPA Remnant Vegetation:

(with daily updates as of 26-10-2007)

- **Endangered (dominant)**
- **Endangered (sub-dominant)**
- **Of-Concern (dominant)**
- **Of-Concern (sub-dominant)**
- **Not of Concern**

Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 2 of 8

- The Right of Way
- **Project Infrastructure**
- **Railway Line**
- **Waterways**
- **Cadastre**
- **LGA Boundary**
- **SGIC**
- **GSDA**

0 1 2 3 4 km

1:50,000 at A3

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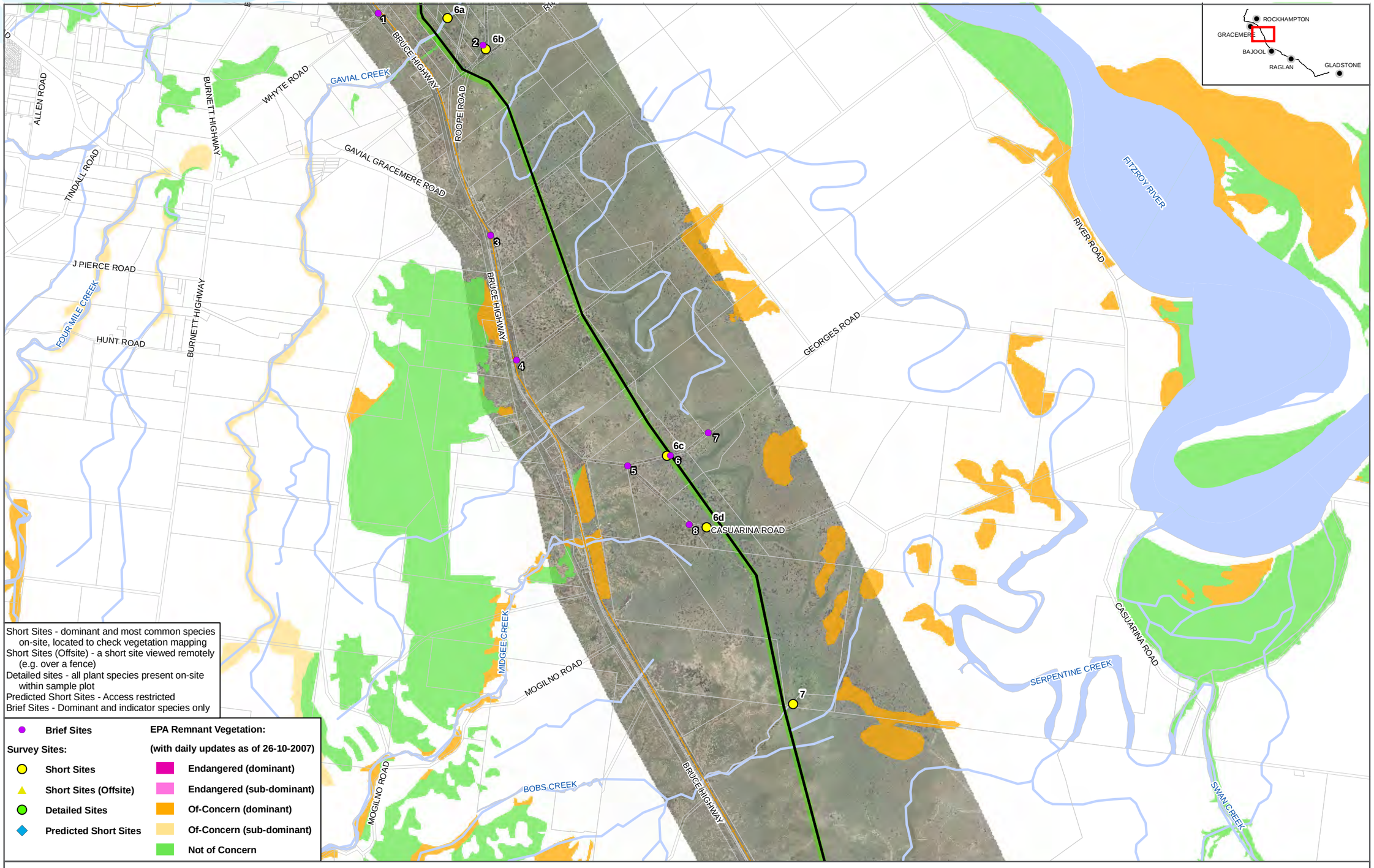
Gladstone Area Water Board

ARUP



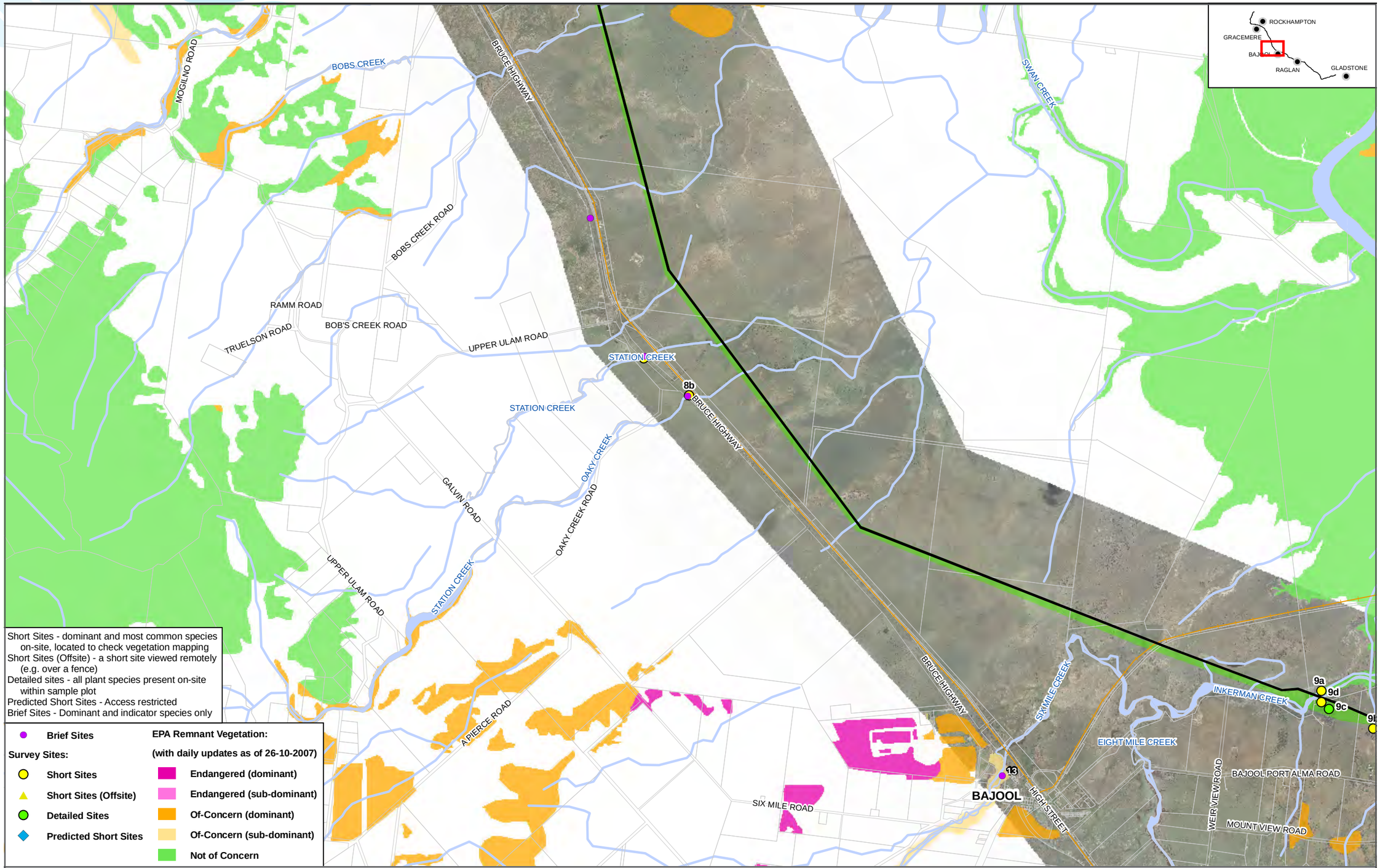
Gladstone - Fitzroy Pipeline Project

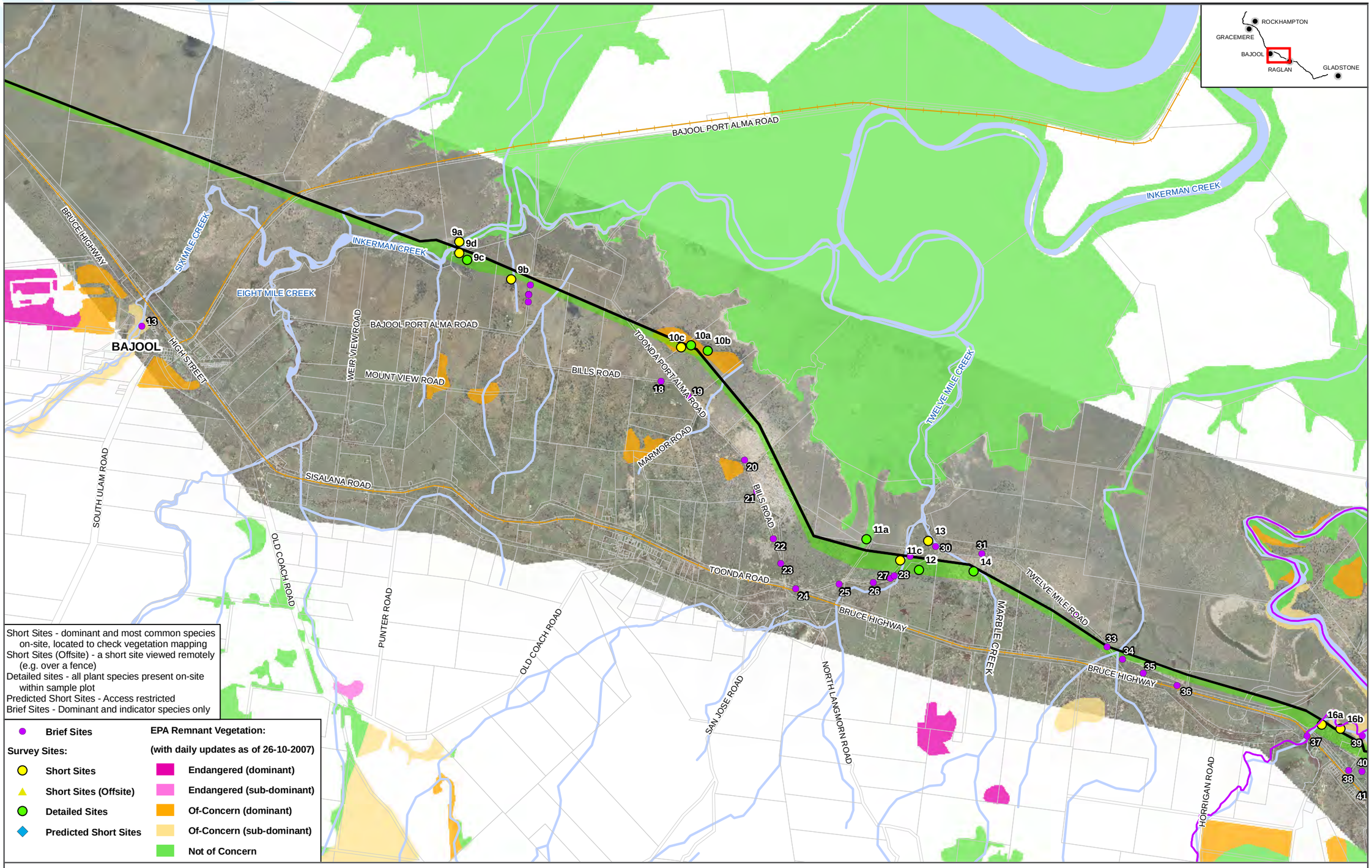
Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 3 of 8

Gladstone Area Water Board

ARUP





Short Sites - dominant and most common species on-site, located to check vegetation mapping
Short Sites (Offsite) - a short site viewed remotely (e.g. over a fence)
Detailed sites - all plant species present on-site within sample plot
Predicted Short Sites - Access restricted
Brief Sites - Dominant and indicator species only

Brief Sites

Survey Sites:

- **Short Sites**
- **Short Sites (Offsite)**
- **Detailed Sites**
- **Predicted Short Sites**

EPA Remnant Vegetation:

(with daily updates as of 26-10-2007)

- **Endangered (dominant)**
- **Endangered (sub-dominant)**
- **Of-Concern (dominant)**
- **Of-Concern (sub-dominant)**
- **Not of Concern**

Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 5 of 8

- The Right of Way
- **Project Infrastructure**
- **Railway Line**
- **Waterways**
- **Cadastre**
- **LGA Boundary**
- **SGIC**
- **GSDA**

0 1 2 3 4 km

1:50,000 at A3

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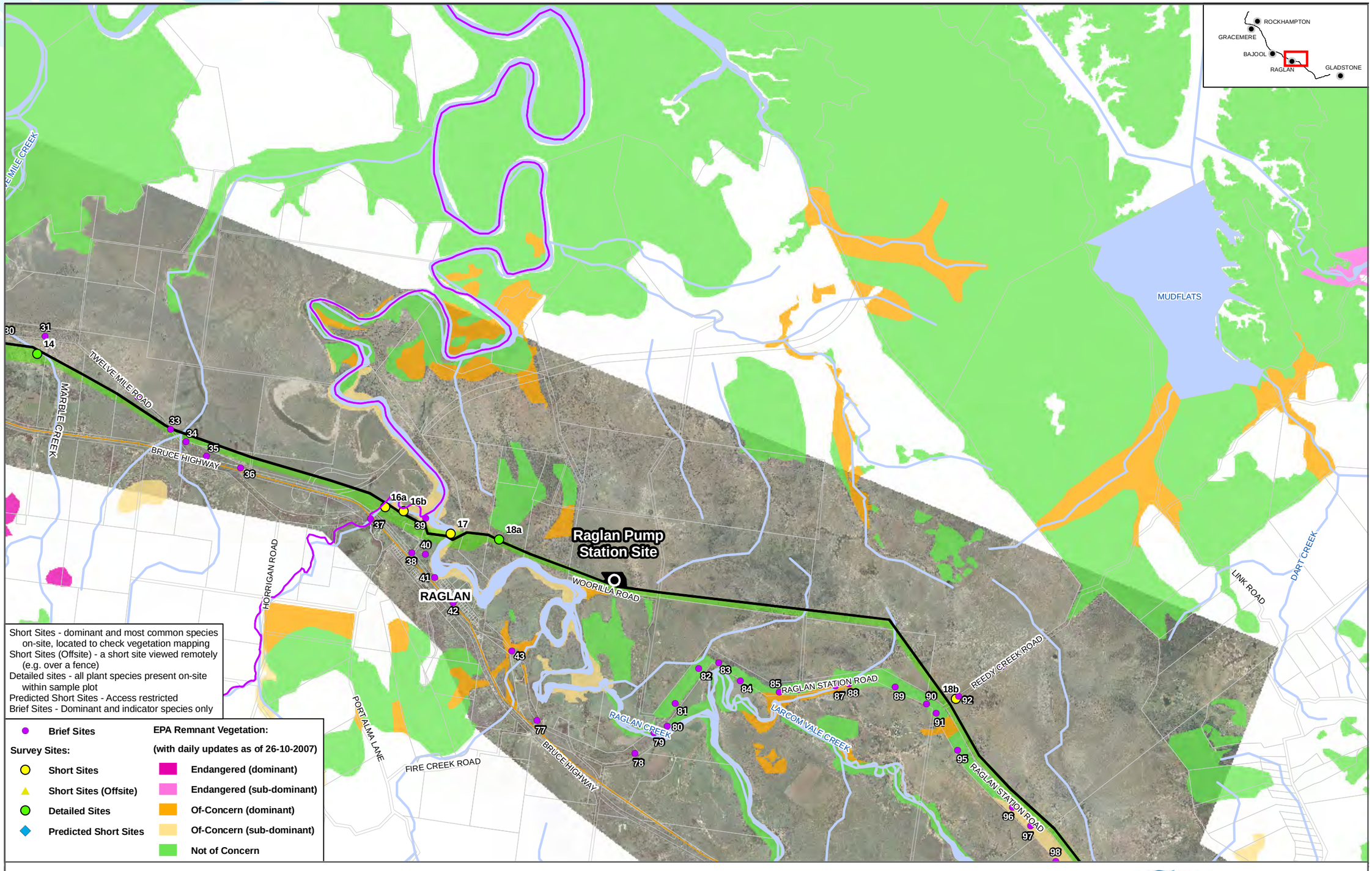
Gladstone Area Water Board

ARUP



Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 6 of 8

The Right of Way
Project Infrastructure
Railway Line
Waterways
Cadastre
LGA Boundary
SGIC
GSDA

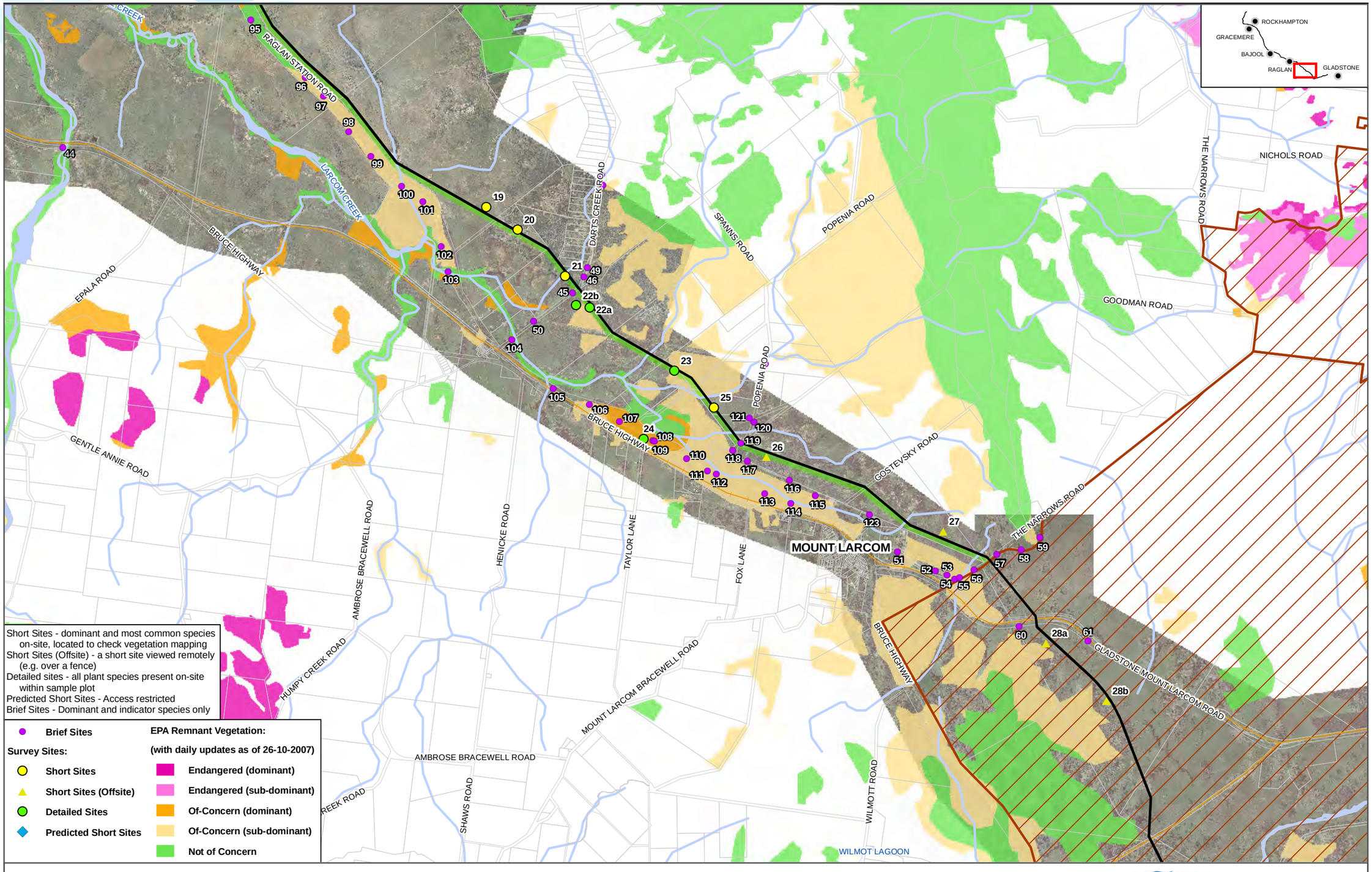
0 1 2 3 4 km

1:50,000 at A3

N

Gladstone Area Water Board

ARUP



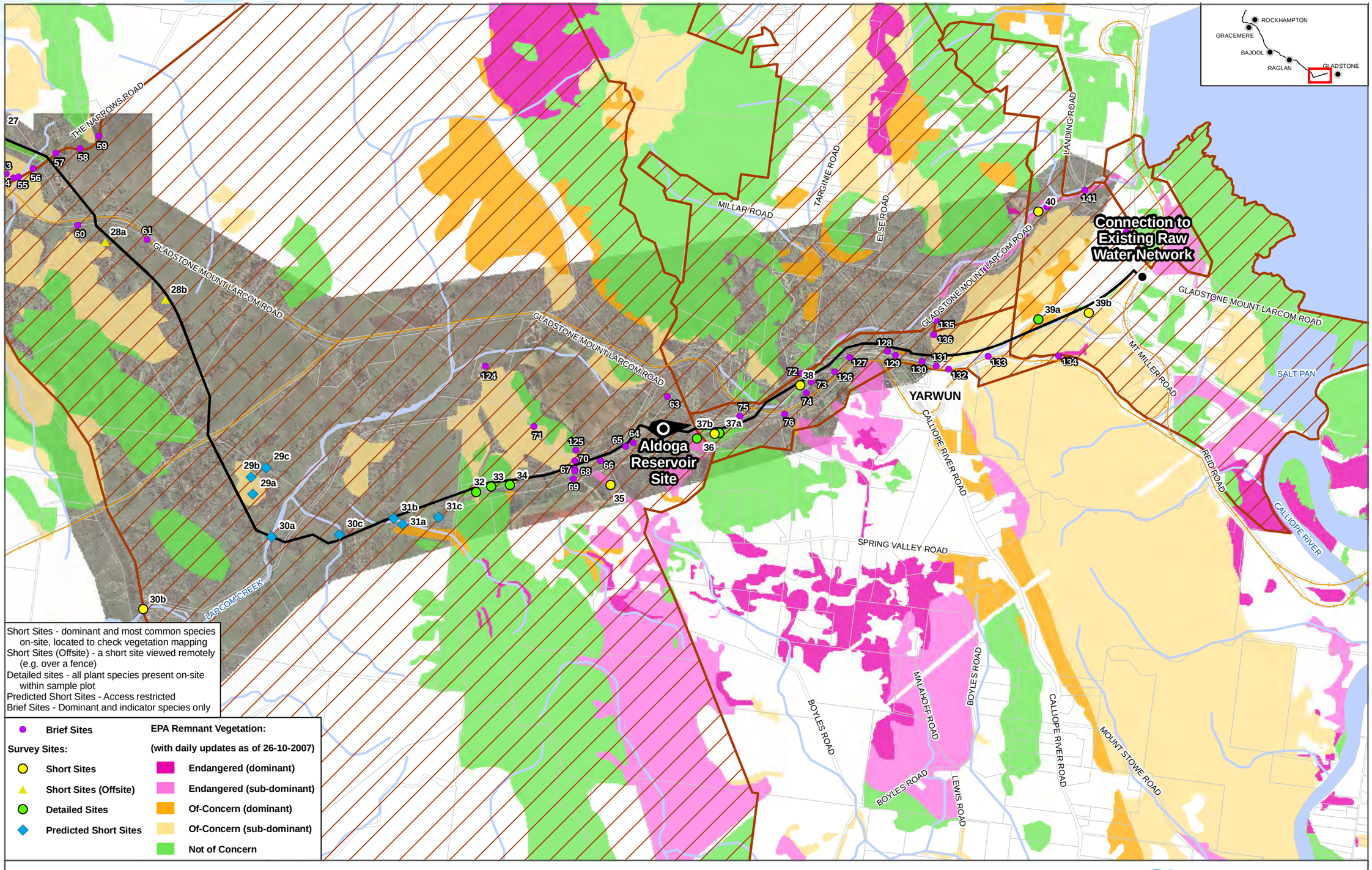
Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 7 of 8

Gladstone Area Water Board

ARUP



Gladstone - Fitzroy Pipeline Project

Figure 6.1 - Regional Ecosystem Mapping With Site Locations

Sheet 8 of 8

Gladstone Area Water Board

ARUP

Table 6.1 Land Zones of Queensland from EPA (2007b)

Land Zone number	Definition (central concept, followed by lay terminology)
1	Deposits subject to periodic tidal inundation Tidal flats and beaches
2	Quaternary coastal sand deposits Coastal dunes
3	Quaternary alluvial systems Alluvium (river and creek flats)
4	Flat to gently undulating Tertiary clay plains Clay plains not associated with current alluvium
5	Plains and plateaus on Tertiary land surfaces, generally with medium-to- coarse-textured soils Old loamy and sandy plains
6	Quaternary inland dunefields Inland dunefields
7	Exposed or shallowly covered duricrusts Ironstone jump-ups
8	Plains and hills on Cainozoic flood basalts Basalt plains and hills
9	Gently undulating landscapes on more or less horizontally bedded fine grained sedimentary rocks Undulating country on fine grained sedimentary rocks
10	Plateaus, scarps and ledges with shallow soils on more or less horizontally bedded medium-to-coarse-grained sedimentary rocks Sandstone ranges
11	Hills and lowlands on metamorphosed sedimentary rocks Hills and lowlands on metamorphic rocks
12	Hills and lowlands on granitic and other pre-Cainozoic igneous rocks Hills and lowlands on granitic rocks

Fitzroy to Bajool

The proposed pipeline corridor from the Fitzroy River through to Bajool consists of alluvial country in the Gracemere and Gavial areas, with dark, high clay content soils, commonly referred to as "black soil". There were a high number of permanent and ephemeral wetlands in these areas. Tree cover was generally sparse as a result of clearing for pasture, and was predominantly scattered Coolabah (*Eucalyptus coolabah*), Blue Gum (*E. tereticornis*), and further south around Bajool, Poplar Box (*E. populnea*).

There were small patches (i.e. less than approximately 1 ha) of remnant scrub within this length of the corridor, with one notable patch in the Gracemere area.

Bajool to Gladstone

Further south around Marmor, the area was slightly hilly, with areas of scrub and Brigalow (*Acacia harpophylla*), which have mostly been cleared. There were small patches (i.e. less than approximately 1 ha) of remnant scrub within this length of the corridor, plus a number of areas of scrub regrowth.

Hills increased in size further south, indicating a change in geology, and the predominant vegetation type around Raglan, Ambrose and Mt Larcom was Grey Box forest (*Eucalyptus moluccana*). Soils tended to be grey and silty, with a lower clay content, and geological parent material was metamorphic or sedimentary, but not generally alluvial like the northern end of the corridor.

The area from Mt Larcom to Gladstone had substantially larger hills of metamorphic origin, which increased slightly in eucalypt species diversity, with species including Narrow-leafed Ironbark (*Eucalyptus crebra*) and Spotted Gum (*Corymbia citriodora*). There were still alluvial areas, but there was a change around Aldoga from the Brigalow Belt South bioregion in the west, to the Southeast Queensland bioregion in the east. This meant the remaining predominant trees on these alluvial plains tended to be Blue Gum (*E.tereticornis*), and not the others described for the northern (and western) end of the corridor.

In most cases the observed remnant vegetation communities were consistent with REs, but appropriate notes were made where there was disagreement. The RE mapping, with site numbers, is shown in Figure 6.1. Detailed site observations (and also Short sites) are shown in Appendix E2.

The mapped REs which occur along the corridor, and the brief descriptions of each RE (EPA 2007b) are shown in Table 6.2.

Table 6.2 Regional Ecosystems that Occur Along the Corridor

RE code	Vegetation management status	Short description from RE description database (EPA 2007b)	General area	Mapping comments
11.1.2	Not Of Concern	Samphire forbland on marine clay plains	Bajool	
11.1.2a	Not Of Concern	Sub-type of 11.1.2. Bare mud flats on Quaternary estuarine deposits, with very isolated individual stunted mangroves such as Grey Mangrove (*Avicennia marina*) *Avicennia marina* and/or Spurred Mangrove (*Ceriops tagal).* May have obvious salt crusts on the soil surface	Bajool	
11.1.4	Not Of Concern	Mangrove forest/woodland on marine clay plains	Raglan Creek	
11.1.4d	Not Of Concern	Sub-type of 11.1.4. Occurs on the landward edge of the tidal flats and in the upper tidal reaches of creeks and rivers where there is a high freshwater influence	Inkerman Creek	
11.3.3	Of Concern	Coolabah *(Eucalyptus coolabah)* woodland on alluvial plains	Gracemere	
11.3.4	Of Concern	Blue Gum (*Eucalyptus tereticornis)* and/or *Eucalyptus* spp. tall woodland on alluvial plains	Gracemere	
11.3.25	Not Of Concern	Blue Gum (*Eucalyptus tereticornis)* or River Red Gum (*E. camaldulensis)* woodland fringing drainage lines	Gavial Creek/ Aldoga	

RE code	Vegetation management status	Short description from RE description database (EPA 2007b)	General area	Mapping comments
11.3.26	Not Of Concern	Grey Box (*Eucalyptus moluccana*)or *E. microcarpa* woodland to open forest on margins of alluvial plains	Ambrose/Darts Creek	Extensive, but may not always be on Land Zone 3, hence would be a different RE
11.3.27	Not Of Concern	Freshwater wetlands	Gracemere	
11.3.27c	Not Of Concern	Sub-type of 11.3.27. Mixed grassland or sedgeland with areas of open water +/- [1] aquatic species. Dominated by a range of species including Spike Sedge (*Eleocharis* spp.), Marsh Wort (*Nymphoides* spp.) and sometimes Common Weed (*Phragmites australis).* Occurs on closed depressions on alluvial plains that are intermittently flooded in inlands parts of the bioregion	Gracemere	
11.3.29	Not Of Concern	Ironbark *(Eucalyptus crebra),* Bendoo (*E. exserta),* Paperbarks (*Melaleuca* spp.) woodland on alluvial plains	Yarwun	More the lowlands east of the corridor
11.11.4	Not Of Concern	Ironbark *(Eucalyptus crebra)* woodland on old sedimentary rocks with varying degrees of metamorphism and folding. Coastal ranges.	Aldoga	
11.11.4c	Not Of Concern	Sub-type of 11.11.4. Grey Box (*Eucalyptus moluccana)* dominated woodland. Other tree species listed for 11.11.4 may occur as sub- or co-dominant species	Aldoga	
11.11.5	Not Of Concern	Microphyll vine forest ± Hoop Pine (*Araucaria cunninghamiana)* on old sedimentary rocks with varying degrees of metamorphism and folding	Aldoga	Not on corridor
11.11.15	Not Of Concern	Ironbark (*Eucalyptus crebra)* woodland on deformed and metamorphosed sediments and interbedded volcanics. Undulating plains	Aldoga	
11.11.16	Of Concern	Northern Blackbutt (*Eucalyptus cambageana),* Brigalow *(Acacia harpophylla)* woodland on old sedimentary rocks with varying degrees of metamorphism and folding. Lowlands	Marmor	
11.11.18	Endangered	Semi-evergreen vine thicket on old sedimentary rocks with varying degrees of metamorphism and folding. Lowlands	Aldoga	Restricted to very small un-mappable area on corridor
12.3.1	Endangered	Gallery rainforest (notophyll vine forest) on alluvial plains	Boat Creek	
12.3.3	Endangered	Blue Gum *(Eucalyptus tereticornis*) woodland to open forest on alluvial plains	Boat Creek	
12.3.7	Not Of Concern	Blue Gum (*Eucalyptus tereticornis),* Weeping Bottlebrush (*Callistemon viminalis),* River Oak (*Casuarina cunninghamiana)* fringing forest	Boat Creek	
12.11.6	Not Of Concern	Spotted Gum (*Corymbia citriodora),* Ironbark (*Eucalyptus crebra)* open forest on metamorphics ± interbedded volcanics	Yarwun	
12.11.14	Of Concern	Ironbark (*Eucalyptus crebra),* Blue Gum (*E. tereticornis)* woodland on metamorphics ± interbedded volcanics	Yarwun	

The known remnant vegetation communities are discussed in two sections, starting from the extraction point at the Fitzroy River, to an approximate halfway point at Bajool, and then from the halfway point at Bajool, finishing near Gladstone. Unless otherwise specified, all sites are within, or partly within, the proposed corridor. Note that where access permission was withheld or restricted, observations were taken from adjacent to the site, with the use of binoculars.

6.6.2.2 Fitzroy to Bajool

This section describes the baseline findings from the field investigation, from the northern end (at the Fitzroy River) and progressing southwards along the project area alignment.

Short site 1

The extraction point on the Fitzroy River had a narrow strip of remnant riverine forest, consisting mostly of Blue Gum (*Eucalyptus tereticornis),* Coolabah *(Eucalyptus coolabah)* and Carbeen (*Corymbia tessellaris).* The understorey had been removed by grazing and other activities. There was also a Declared Pest Plant (Water Hyacinth (*Eichhornia crassipes*)) seen at this site.

Detailed site 2

There was an area of wetland mapped on RE mapping (EPA 2005b) past the end of Tyrrel Road, which occurred mainly on Lot 102 LN176. Due to restricted access to this property, the adjacent property to the west was sampled (Lot 3 RP843225), with access from the southern edge of the wetland. Aquatic vegetation at the site was in good general condition (i.e. inundated, native aquatic vegetation with limited aquatic weed infestation). However, approximately 100 m north of this location (the northern edge), sampling by aquatic ecologists (2007), found that the banks were infested by fireweed (*Senecio madagascariensis*).

Although clearing has probably occurred around the lagoon, it is possible that riparian trees were originally sparse or absent close to the edge of the lagoon in this area.

Detailed site 3a

An area of Blue Gum (*Eucalyptus tereticornis*) and Coolabah (*Eucalyptus coolabah)* was observed near the T-junction of Malchi Nine Mile Road and Fairy Bower Road, conforming with the representation on mapping as Of Concern RE 11.3.3 (EPA 2005b). This area had few trees, indicating the diffuse edge of the very open woodland, and/or selective clearing. Only a few individual trees occurred in the proposed corridor.

Detailed site 3b

Very large Blue Gum (*Eucalyptus tereticornis*) old growth trees were observed at this site, in conformance with representation on RE mapping as Of Concern RE 11.3.3 (EPA 2005b). Other tree species present included Sally Wattle (*Acacia salicina*) and Coolabah (*Eucalyptus coolabah*). The shrub layer was conspicuously absent, possibly due to clearance for agricultural purposes.

Short site 4

A small, unmapped remnant of softwood scrub is close to the corridor on Malchi Nine Mile Road. This scrub falls into the category of Endangered "semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar bioregions", as defined in the EPBC Protected Matters Report. The property name was "Hillview" (Lot 2 RP611138), and was on the western side of the road. Figs (*Ficus* spp.) were observed at the site and indicate a community consistent with a softwood scrub ecosystem.

Detailed site 5

There was a small wetland north of Fairy Bower Road, represented on RE mapping as Not Of Concern RE 11.3.27 (EPA 2005a) about 400 m west of Fogarty Road, on Lot 248 LIV401036. The wetland was a highly disturbed lagoon, with a high degree of weed infestation and limited native aquatic vegetation. Weed infestation was unidentifiable, however were known to be weeds due to invasive growth habit. There was also a lagoon several hundred metres to the east, of similar condition, but it had been dammed, and was not of original wetland form (i.e. artificial water level).

Short site 6a

Large Blue Gum *(Eucalyptus tereticornis)* individuals were observed along the high banks of Gavial Creek. The site was heavily affected by grazing, with a high level of weed infestation.

Short site 6b

An unmapped remnant of Poplar Box (*Eucalyptus populnea*) and Blue Gum (*Eucalyptus tereticornis)* was observed on the road reserve near the intersection of Roope Road and River Road.

Short sites 6c and 6d

Unmapped remnants of Poplar Box (*Eucalyptus populnea*) and some Blue Gum (*Eucalyptus tereticornis)* were observed on the road reserves of Georges Road (Site 6c) and Casuarina Road (Site 6d).

Short sites 7, 8a and 8b

Detailed sites were planned for Bob's Creek (on Lot 5 RP604251), Station Creek and Oakey Creek (on Lot 4 RP600951) (Sites 7, 8a and 8b respectively). Due to restricted access, substitute Brief sites were implemented at upstream crossings on the Bruce Highway (upstream of the proposed corridor) with the same site identifiers. Riparian vegetation on these creeks was generally Blue Gum (Eucalyptus tereticornis) and River Oak (Casuarina cunninghamiana). Weed infestation was high, so native aquatic macrophyte habitat was poor. It is assumed that the vegetation would be similar at the creek crossing locations on the corridor, although there may be some tidal or marine influence, in which case there may be an intergrade into mangrove communities. In this case the River Oak (Casuarina cunninghamiana) would be replaced by Swamp Oak (Casuarina glauca), and the mangrove species would probably be Grey Mangrove (Avicennia marina). Satellite imagery and high resolution aerial photography available at the time of preparation of this chapter suggests that the vegetation away from the riparian zones on these three creeks has been cleared.

6.6.2.3 Bajool to Gladstone.

This section describes the baseline findings from the field investigation, from approximately halfway along the project area alignment, and progressing southwards towards Gladstone.

Short site 9a

Remnant mangroves dominated by Grey Mangrove *(Avicennia marina)* were observed at this site, on Inkerman Creek, west of the Bajool Port Alma Road. There were also patches of saltmarsh. These observations were in conformance with representation on RE mapping as Not Of Concern RE 11.1.2 (EPA 2005b).

Short site 9d

Unmapped Brigalow (*Acacia harpophylla*) was observed at this site, with species composition and structure of this community similar to that of site 9c (refer below).

Detailed site 9c

A 200 m stretch of low-growing Brigalow (*Acacia harpophylla*) with extensive gilgai (a high density of small waterholes or pools, each ranging from about 5 to 10 m in diameter) was observed on the south side of Inkerman Creek on Lot 68 DS141. This patch of vegetation occurred between the tidal interface of Inkerman Creek, and the taller Brigalow further east towards the Toonda Port Alma Road. Brigalow (*Acacia harpophylla*) is a Threatened Ecological Community under the EPBC Act. However, the height of the community on-site averaged approximately 3 m, which does not meet the structural requirements for the definition of remnant Brigalow (11 to 15 m) under the VM Act, and the EPBC Act uses the structural classification of the VM Act (in this case RE 11.3.1 or 11.4.3). If the Land Zone in this area was interpreted as Land Zone 4 (clay plains rather than the alluvials of Land Zone 3), then the RE for this Brigalow would become RE 11.4.3 (which has a defined height of 10 to 16 m under the VM Act). The vegetation at Site 9c Rarely exceeded three metres in height and its remnant status was uncertain. Site 9c was typical of the whole patch. Regrowth can be considered as remnant if it reaches 70 percent of the height of its remnant height defined under the VM Act, but the 3 m height of this Brigalow at Site 9c was too short for this.

Short site 9b

An advanced regrowth patch of Brigalow (*Acacia harpophylla*) was observed approximately 100 m west of the Toonda Port Alma Road (on Lot 69 DS141) and adjacent to the proposed corridor. This regrowth was advanced enough to be considered as remnant. The VM Act considers that regrowth that is at least 70 percent of the accepted remnant height, and at least 50 percent of the accepted remnant cover, can be classified as remnant vegetation.

Detailed sites 10a and 10b, and Short site 10c

RE mapping shows a remnant Of Concern community off the Toonda Port Alma Road of Northern Blackbutt (*Eucalyptus cambageana*) with Brigalow (*Acacia harpophylla*), mosaiced with Grey Box (*Eucalyptus moluccana*) on Lot 98 DS186 and Lot 99 DS186. However, site inspection found that the remnant was mostly low Brigalow (*Acacia harpophylla*) (probably regrowth) and some Belah (*Casuarina cristata*). There was an infestation of Rubber Vine (*Cryptostegia grandiflora*) around much of the edge of the remnant.

Detailed site 11a

Marine drainages north of the Twelve Mile Road were identified for sampling although vegetation appeared sparse on aerial photos. Site 11b was located on a road reserve between Lot 84 DS185 and Lot 85 DS185, along a minor creek with marine influence. Although mapped as Not Of Concern (EPA 2005b), a eucalypt regeneration area, fenced off from grazing stock, was observed at the site. Blue Gums (*Eucalyptus tereticornis)* in this enclosure were a maximum of about 4 m tall, with some scattered mature individuals.

Short site 11c

Riverine vegetation along Twelve Mile Creek on Lot 85 DS185 was observed to be mostly cleared and not remnant. It consisted mainly of scattered Blue Gum (*Eucalyptus tereticornis)* and River Oak *(Casuarina cunninghamiana).*

Detailed site 12

Tall open forest of Blue Gum (*Eucalyptus tereticornis)* in good condition was observed on the road reserve on Twelve Mile Road. This community was also representative of the adjacent Lot 29 DS37.

Short site 13

A small patch of remnant softwood scrub in good condition was observed adjacent to the corridor, and was initially observed as Brief site 130 in initial reconnaissance. This scrub falls into the category of Endangered "semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar bioregions", as defined in the EPBC Act Protected Matters Report.

Detailed site 14

This site at Marble Creek is connected to Short site 13, and was observed to have softwood scrub in good condition, in a gallery along the creek banks on Lot 28 DS37. The scrub along this creek was in good condition and was diverse in species composition. Vegetation away from the creek had been cleared.

Short sites 16a, 16b and 17

In the Horrigan Creek (Short sites 16a and 16b) and Raglan Creek (Short site 17) area, RE mapping identifies extensive areas of Of Concern mangroves, observed to be dominated by Blind Your Eyes Mangrove (*Excoecaria agallocha)* and Grey Mangrove (*Avicennia marina)*. A large area of mangroves in good condition was observed on Raglan Creek at Site 17, in conformance with representation on mapping as Not Of Concern RE 11.1.4. An adjacent unmapped, disturbed area of Narrow-leafed Ironbark (*Eucalyptus crebra)* was observed to be in poor condition due to heavy recreational use and dumping.

Detailed site 18a

The southern end of a large remnant of Narrow-leafed Ironbark (*Eucalyptus crebra*) on Lot 36 DT40169 was observed to be in good condition and was less than 100 m north of an unmapped wetland, which had waterbirds on it at the time of survey. A dam was constructed on the wetland, but much of the wetland appeared to be in good condition.

Short site 18b

The dominant species observed at a road reserve on Reedy Creek Road was Poplar Box (*Eucalyptus populnea*), and the forest structure was narrow but intact.

Brief sites 19 and 21

Regrowth areas of diverse scrub-related species were observed on the northeastern side of the Toonda Port Alma Road, as part of a former understorey of cleared Ironbark (*Eucalyptus crebra*) on Lot 101 DS185 and Lot 102 DS185. This regrowth Rarely exceeded 2 m in height and was not considered remnant. There is the possibility that the Threatened species, listed as occurring in the project area, occur in this area of regeneration. This area has been cleared, and is not regarded as having significant ecological value, because the regrowth consists mainly of suckers less than 1 m in height. If allowed to regenerate, however, it might be found to contain one or more of the listed Threatened species. Further investigation of this area is not practicable until the ROW is finalised.

Approximately 1 km south of Brief sites 19 and 21

Scattered mature gums (generally Blue Gum *(Eucalyptus tereticornis)*) were observed approximately 1 km south of the area of scrub regrowth (mentioned above) on Lot 8 DS185.

Short site 20

A patch of advanced regrowth with some scattered original trees on Lot 162 DS61 was observed to be predominantly Narrow-leafed Ironbark (*Eucalyptus crebra)* with some Grey Box (*Eucalyptus moluccana*), with an understorey of Brigalow *(Acacia* spp*)*. The general structure of this regrowth was of insufficient height and cover to be considered as remnant vegetation, but it was approaching remnant status.

Short site 21 and Detailed sites 22a and 22b

A general change in this area to Grey Box (*Eucalyptus moluccana*), which continued eastward, was observed at Short site 21 and Detailed site 22b, both adjacent to Darts Creek Road. Narrow-leafed Ironbark (*Eucalyptus crebra*) tended to occur on hills and rises, and was observed at Detailed site 22a. Blue Gum (*Eucalyptus tereticornis)* was also present in lower lying areas, as represented on mapping as Of Concern RE 11.3.4.. This area generally had remnant vegetation in good condition because of its intact structure and general lack of weed infestation. The area on the eastern side of Darts Creek Road (Detailed sites 22a and 22b) was in the best condition.

Detailed site 23

Remnant Grey Box (*Eucalyptus moluccana*) forest in good condition was observed on Lot 114 DS256 and Lot 6 RP214228. Refer to Detailed site 24 and Short site 26 for sampling of other areas of this Gum Topped Box (*Eucalyptus moluccana)* forest.

Detailed site 24

A large lagoon (Horseshoe Lagoon) was observed northwest of Mt Larcom, 300 m north of the Bruce Highway (outside the proposed corridor). The trees on the corridor (and within Site 24) were Grey Box (*Eucalyptus moluccana*). The site was observed to be disturbed on either side due to a power line easement and a railway line. The dominant trees around the nearby undisturbed lagoon were large Blue Gum (*Eucalyptus tereticornis*).

Short site 25

A grassland area of several hectares, observed adjacent to Popenia Road, may possibly be natural grassland rather than cleared forest. The western side of this grassland was cleared, and has no remnant grassland value, regardless of the authenticity of the main body of grassland to the east.

Short site 26

Gum Topped Box (*Eucalyptus moluccana*) forest was observed on the north side of Popenia Road. Partial clearing has fragmented the canopy of this community.

Short site 27

Grey Box (*Eucalyptus moluccana)* forest was observed north of Mt Larcom near Brief sites 52 to 54, which were observed as remnant (south of the corridor). To the north of this remnant, communities were predominantly disturbed and/or regrowth. Due to restricted access, this site was observed at the property boundary of Lot 20 DT40124, from the northeast corner of the showground.

Short sites 28a and 28b

These areas extend from Mt Larcom to the east for several kilometres (to Aldoga). RE mapping indicated that remnants on these sites were Grey Box *(Eucalyptus moluccana)* (RE 11.3.26) and Blue Gum (*Eucalyptus tereticornis)* (RE 11.3.4), with some Narrow-leafed Ironbark (*Eucalyptus crebra)* (RE 11.11.15) further east. This occurrence of Grey Box *(Eucalyptus moluccana)* forest was confirmed from off-site using binoculars.

Short sites 29a and 29b

Short sites 29a and 29b confirmed RE mapping of Not Of Concern Grey Box *(Eucalyptus moluccana),* which was in good condition. Note that access permission for this site was not granted, and it was not visible from off-site.

Short Site 29c

Note that access permission for this site was not granted, and it was not visible from off-site.

Short sites 30a and 30b

Larcom Creek was sampled at Short sites 30a and Short site 30b. Note that access permission for site 30a was not granted, and aerial photo interpretation was necessary. At both sites, riverine forest was observed along the creek, confirming the continuity of the community

Short Site 30c

Note that access permission for this site was not granted, and it was not visible from off-site.

Short Sites 31a and 31b

Note that access permission for these sites was not granted, and they were not visible from off-site

Short Site 31c

The edge of the remnant of Site 31c was viewed remotely (approximately 200m with binoculars from fenceline). Short site 31c confirmed that the remnant vegetation in this area was greater in extent than represented by the RE mapping (EPA 2005). The mapped remnant of RE 11.3.4 (Blue Gum (*Eucalyptus tereticornis*) was surrounded by patchy Narrow-leafed Ironbark (*Eucalyptus crebra*) in good condition. It is possible that the RE mapping needs to be revised in this area to account for Narrow-leafed Ironbark (*Eucalyptus crebra*) (most likely RE 11.11.15).

Detailed sites 32, 33 and 34

A large remnant was observed over these three sites, which confirmed that the RE mapping was correct, with predominantly Narrow-leafed Ironbark (*Eucalyptus crebra)* at Site 32 (as Not Of Concern RE 11.11.15), Spotted Gum (*Corymbia citriodora)* at Site 33 (as Not Of Concern RE 11.11.4) and Grey Box (*Eucalyptus moluccana)* at Site 34 (as Of Concern RE 11.2.26).

Short site 35

Vegetation on this site was observed from directly off-site due to restricted access. The RE mapping for the area shows a mosaic of pre-clearing REs. Observations confirmed that only Narrow-leafed Ironbark (*Eucalyptus crebra)* (Not Of Concern RE 11.11.4) occurred at the site (in addition to Spotted Gum (*Corymbia citriodora*)). The mapped Endangered RE was not present at the site, and therefore the only RE observed was Not Of Concern. Access was restricted, so the site data was recorded from off-site observation from a pipeline access track, supported by large-scale (1:10,000) aerial photograph interpretation.

Detailed sites 36 and 37a, and Short sites 37b and 38

Remnant fragments were observed on these sites, and were in poor condition due to structural disturbance and fragmentation. All vegetation represented by these sites was Not Of Concern, with the exception of Short site 37b, which was a very small and un-mappable patch of softwood scrub species, with no remnant structure that can therefore not be classified as Endangered as RE mapping represents. No Threatened Species were found on this site.

Detailed site 39a and Short site 39b

A large area of remnant vegetation was observed East of Yarwun. These sites confirmed that Of Concern RE 12.11.14 and Not Of Concern RE 12.11.6 (respectively) were correctly mapped (the change to REs starting with 12 indicates the Southeast Queensland bioregion, rather than the Brigalow Belt South bioregion). These communities were dominated by Narrow-leafed Ironbark (*Eucalyptus crebra)* and Spotted Gum (*Corymbia citriodora)* respectively. *Macrozamia* sp. were seen in the understorey in places (Brief site 134), but not along the proposed corridor itself.

Short site 40

Endangered RE 12.3.3 composed of riverine Blue Gum (*Eucalyptus tereticornis),* and rainforest on Boat Creek were observed at Short site 40.

6.6.3 Rare and Threatened Species

6.6.3.1 Database Searches

Results of the searches of Wildlife Online (EPA 2007a) and the EPBC Act Protected Matters Report (DEWHA, 2007) are shown combined in Table 6.3.

Table 6.3 Wildlife Online and EPBC Protected Matters Report

Species records, with reported species from the EPBC Act Protected Matters Report that did not occur on the Wildlife Online List at bottom of table	NC Act*	Wildlife Online records*	*EPBC Act**	*EPBC Act* Protected Matters Report (smaller defined area)*
Acacia pubicosta	R	1	.	
Acacia storyi	R	2	.	
Actephila sessilifolia	R	9	.	
Alyxia magnifolia	R	9	.	
Asplenium pellucidum	V	2	V	
Atalaya calcicola	R	6	.	
Atalaya collina	E	3	E	Reported
Atalaya rigida	R	18	.	
Callicarpa thozetii	R	1	.	
Choricarpia subargentea	R	3	.	
Cossinia australiana	E	4	E	
Cupaniopsis shirleyana	V	10	V	Reported
Cycas megacarpa	E	25	E	
Cycas ophiolitica	E	14	E	Reported

Species records, with reported species from the EPBC Act Protected Matters Report that did not occur on the Wildlife Online List at bottom of table	NC Act*	Wildlife Online records*	*EPBC Act**	*EPBC Act* Protected Matters Report (smaller defined area)*
Dansiea elliptica	R	10	.	
Decaspermum struckoilicum	E	10	.	
Denhamia parvifolia	V	1	V	
Eucalyptus raveretiana	V	2	V	Reported
Graptophyllum excelsum	R	15	.	
Hakea trineura	V	1	V	
Hernandia bivalvis	R	18	.	
Livistona drudei	V	2	.	
Macropteranthes fitzalanii	R	4	.	
Macropteranthes leiocaulis	R	13	.	
Marsdenia brevifolia	V	1	V	
Parsonsia larcomensis	V	4	V	Reported
Parsonsia lenticellata	R	12	.	
Philotheca acrolopha	V	1	V	
Quassia bidwillii	V	2	V	Reported
Stackhousia tryonii	R	4	.	
Zieria sp. *(Mt Larcom N. Gibson TOI8)*	V	4	.	
Reported species from the EPBC Act Protected Matters Report that did not occur on the Wildlife Online List:				
Bosistoa selwynii	NAQ	0	V	Reported
Bosistoa transversa	.	0	V	Reported
Bulbophyllum globuliforme	R	0	V	Reported
Corymbia xanthope	V	0	V	Reported
Leucopogon cuspidatus	.	0	V	Reported

** CODES:*

NC Act *indicates the conservation status of each taxon under the* Nature Conservation Act 1992.
The codes are Presumed Extinct (PE), Endangered (E), Vulnerable (V), Rare (R), Common (C) and Not Protected. NAQ is not an original code used by the NC Act*; it has been added here to indicate that this taxon is not held at the Queensland Herbarium according to AVH, and therefore has no status in the* NC Act *at present.*
EPBC Act *indicates the conservation status of each taxon under the* Environment Protection and Biodiversity Conservation Act 1999.
The codes are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct In The Wild (XW) and Vulnerable (V).
Wildlife Online Records *indicates the number of records of the species contained within the database for the area searched.*
Reported by the EPBC Act Protected Matters Report means that this particular species is mapped as occurring within the smaller defined area of the EPBC Act Protected Matters Report search area, in addition to Wildlife Online records.

A search of the Wildlife Online database (EPA 2007a) for Rare and Threatened species listed in the NC Act returned a list of 31 plant species, shown in Table 6.3. The original extract is shown in Appendix E2, and is represented in two halves (west and east) due to limitations in longitudinal range of the database search. It should be noted that the search area specified needs to be a rectangle, and the number of different species is highly likely to be over-represented (i.e. some are not likely to be present in the project area). A total of five species were listed as Endangered, 11 species as Vulnerable, and 15 as Rare (as shown in Table 6.3).

An EPBC Act Protected Matters Report (DEWHA 2007) was generated from a similar search, but with a more narrowly defined search area (search area and results from original extract are shown in Appendix E2) and reported a list of eleven plant species and their conservation status (nine Vulnerable and two Endangered, as shown in Table 6.3). Five species were reported that did not occur on the Wildlife Online list, indicating that these species are expected to occur, but have not been recorded in the search area. For these species, refer to the last five entries in Table 6.3.

6.6.3.2 Investigation Results

No targeted Rare or Threatened plant species were observed during surveys in either section of the corridor. However, one non-target species was observed, although it was a sterile specimen and absolute confirmation of identification was not possible. This was a Vulnerable species (listed under the EPBC Act and the NC Act), and was one individual of (probably) Ooline (*Cadellia pentastylis*) found at Detailed Site 14 (Marble Creek). This constitutes an EPBC Act referral trigger.

Almost all of the species listed as Endangered or Vulnerable under the NC Act, and Threatened under the EPBC Act, are scrub species (i.e. species typically found in scrub). These species were assumed to be most likely to occur within remnant patches of softwood scrub or vine thicket, so targeted survey for these species was restricted to these remnant patches. Partially cleared, or regrowth, areas of scrub were also surveyed as part of the vegetation survey. None of the listed scrub species were found during the surveys. If they were present, they are nevertheless protected by virtue of their habitat (*viz.* scrub), which is protected under the NC Act and EPBC Act.

Black Ironbox (*Eucalyptus raveretiana*) was listed in both databases as Vulnerable (see Table 6.3) and is known to occur in riverine areas that are likely to be intersected by the corridor (see Table 6.4, and Appendix E2 for original Wildlife Online extract). It was not found during the survey, despite being specifically searched for at each of the creek crossings.

Corymbia xanthope is listed under the EPBC Act as Vulnerable (see Table 6.10 Summary of Significant Impact Criteria for Reported EPBC Threatened flora species) and is known to occur north of Rockhampton. It is considered unlikely that this species occurs in the study area, based on collection label details of this species (Botanic Gardens Trust 2004), which indicate it occurs on skeletal soils in association with *Hakea* sp. and *Triodia* sp. This type of habitat was not observed in the project area.

The two cycads *Cycas megacarpa* and *Cycas ophiolitica* were listed in both databases as Endangered, but are not reported in the EPBC Act Protected Matters Report for the project area. They are known to occur in the project area (see Table 6.4, and Appendix E2 for original Wildlife Online extract) and are likely to be in forested areas intersected by the corridor. However, neither of these species was observed during field assessments. It is possible that a young *Cycas* sp. without a trunk may be confused with *Macrozamia sp.*, but nothing that looked like either genus was seen within the corridor (except, at a distance, for the marginally similar *Xanthorrhoea johnsonii*).

The overall findings of survey were also generally in accordance with those of previous survey work in the same general area by HLA Envirosciences (2006). A notable difference is that the two Threatened species found by HLA Envirosciences survey (*Macrozamia serpentina* and Black Ironbox (*Eucalyptus raveretiana*)) were not found in the corridor, but occur in the broader study area used in the HLA survey.

6.6.3.3 Threatened Species and Likelihood of Occurrence

Mt Morgan Myrtle (*Decaspermum struckoilicum*) was listed as Endangered in Wildlife Online, but it occurs in the Mt Morgan area only (AVH search, Centre for Plant Biodiversity Research, Council of Heads of Australian Herbaria (2007) and Harden *et al.* (2006)), and is considered unlikely to occur within the proposed corridor. Struck Oil is the name of the locality where this species was found.

There are many species listed in Wildlife Online as Vulnerable or Rare that are known to occur in the project area or surrounds, most of which were not reported by the EPBC Act Protected Matters Report. These include a variety of species that occur in a variety of habitats. These species are listed in Table 6.4, with their likely habitat or area and likelihood of occurrence within the corridor.

Table 6.4 Threatened Species and Likelihood of Occurrence

Species records, with unrecorded species from *EPBC Act* Protected Matters Report at bottom of list	Likely habitat or area (rows in this table with scrub species are shaded)	Likelihood of occurrence of habitat
Acacia pubicosta	Mt Morgan area	Low
Acacia storyi	Sandstone plateaux	Low
Actephila sessilifolia	Scrub	Fair*
Alyxia magnifolia	Scrub	Fair*
Asplenium pellucidum	Rainforest	Low
Atalaya calcicola	Scrub	Fair*
Atalaya collina	Scrub	Fair*
Atalaya rigida	Scrub	Fair*
Callicarpa thozetii	Rainforest	Low
Choricarpia subargentea	Scrub	Fair*
Cossinia australiana	Scrub	Fair*
Cupaniopsis shirleyana	Scrub	Fair*
Cycas megacarpa	Coastal ranges	Fair
Cycas ophiolitica	Coastal ranges	Fair
Dansiea elliptica	Scrub	Fair*
Decaspermum struckoilicum	Scrub - Mt Morgan area	Fair*
Denhamia parvifolia	Scrub	Fair*
Eucalyptus raveretiana	Riverine	Fair
Graptophyllum excelsum	Scrub	Fair*
Hakea trineura	Well-drained soils	Low
Hernandia bivalvis	Scrub	Fair*
Livistona drudei	Stream banks on coastal plains	Low
Macropteranthes fitzalanii	Scrub	Fair*
Macropteranthes leiocaulis	Scrub	Fair*
Marsdenia brevifolia	Scrub	Fair*
Parsonsia larcomensis	Scrub	Fair*
Parsonsia lenticellata	Scrub	Fair*
Philotheca acrolopha	Heath	Low
Quassia bidwillii	Scrub	Fair*

Species records, with unrecorded species from *EPBC Act* Protected Matters Report at bottom of list	Likely habitat or area (rows in this table with scrub species are shaded)	Likelihood of occurrence of habitat
Stackhousia tryonii	Serpentinite	Low
Zieria sp. *(Mt Larcom N. Gibson TOI8)*	Scrub	Fair*
Bosistoa selwynii	Scrub	Fair*
Bosistoa transversa	Scrub	Fair*
Bulbophyllum globuliforme	Rainforest	Low
Corymbia xanthope	Skeletal soils	Low
Leucopogon cuspidatus	Heath	Low

Likelihood of occurrence of habitat **only within remaining scrub remnants.*

6.6.4 *EPBC Act* Referral Triggers Identified from Existing Information

Several EPBC Act referral triggers were identified from preliminary data. Those triggers, based on likelihood of occurrence from habitat and distribution data, were:

- The presence of "semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar bioregions" (referred to as *scrub* in this chapter), as defined in the EPBC Act Protected Matters Report as Threatened Ecological Communities. A small, unmapped patch of this scrub was observed on the Malchi Nine Mile Road at Brief site 177 (see Short site 4, in Section 6.5.2.2), and is an EPBC Act referral trigger. Also, there is the possible presence of Whitewood (*Atalaya collina,* Endangered under the EPBC Act) in this scrub. This scrub remnant may also contain the EPBC Act-listed scrub species *Quassia bidwillii,* Cossinia *(Cossinia australiana), Cupaniopsis shirleyana* and *Denhamia parvifolia*
- Whitewood *(Atalaya collina*, Endangered under the EPBC Act) could occur in the patch of scrub at Brief site 30 on the Twelve Mile Creek Road, which is closer to Yarwun. Brief site 30 is approximately 200 m to the northeast of the corridor, so a search for this species was made for at least 2 km either side of that patch along the corridor in likely areas of habitat. A simultaneous search was made for the EPBC Act-listed scrub species *Quassia bidwillii,* Cossinia *(Cossinia Australiana), Cupaniopsis shirleyana* and *Denhamia parvifolia*
- The forest communities east of Yarwun, (sampled by Detailed site 39a, Short site 39b, and Brief sites 133 to 136) dominated by Spotted Gum (*Corymbia citriodora) and* Narrow-leafed Ironbark (*Eucalyptus crebra)*, had *Macrozamia* sp. in the understorey in places. As mentioned previously, young Endangered cycads *Cycas megacarpa* or *C. ophiolitica* (i.e. without trunks) could appear to be *Macrozamia* spp. *Cycas megacarpa* or *C. ophiolitica* are Endangered under the EPBC Act and this is a referral trigger
- Riverine crossings along the corridor may possibly have Black Ironbox *(Eucalyptus raveretiana)* in places, which is listed as Vulnerable under the EPBC Act, and is a referral trigger. All river crossings within the ROW (approximately 12 crossings from the extraction point to Yarwun) were inspected for this species where access was granted. This species was not observed in the ROW, but could possibly occur within the corridor.

6.6.5 Biodiversity Planning Assessment Mapping

Biodiversity Planning Assessment (BPA) (EPA 2005c) mapping was used to identify significant areas of biodiversity. These areas are summarised in Table 6.5. BPA mapping is prepared by the EPA using the Biodiversity Assessment Mapping Methodology (BAMM). BAMM provides a consistent approach for assessing biodiversity values at the landscape scale in Queensland using vegetation mapping data generated or approved by the Queensland Herbarium as a fundamental basis.

Table 6.5 Biodiversity Planning Assessment Mapping Summary

Area/Location	Level of significance	Description of criteria*	Sample site if applicable
Gracemere	State	Significant wetland (criteria B1)	2
Area near Bajool	State	Significant wetland (criteria B1)	9a
	Regional	Remnant contains at least one Of Concern RE (criteria B1) Remnant contains Special Biodiversity Values (criteria I). *Note: this criterion is not based on the RE mapping (on Inkerman Creek near Bajool) – instead, it is a condensed area of about 100 ha approximately 2.5 km northwest of Inkerman Creek, along the corridor.* Special Biodiversity Values (criteria I) relate to Yellow Chat habitat	Refer to Chapter 7, Terrestrial Fauna, and discussion on Yellow Chat habitat
	Local	Wetland	
Raglan Creek	State	Significant Wetland (criteria B1)	17
	Regional	Contains at least one RE with < 10% extent remaining or naturally Rare in the sub-region (criteria B2)	
	Local	Remnant contains Special Biodiversity Values (criteria I): Wetland	
Darts Creek area	Regional	Remnant contains at least one RE with 10-30% extent remaining (criteria B2) and remnant is part of a Tract that is one of the largest of its type in the bioregion (criteria C)	22 (a, b)
DIP land southeast of Mt Larcom: 1st remnant south of the highway (proposed flora site 28)	Regional	Remnant contains at least one RE with 10–30% extent remaining (criteria B2) and remnant is part of moderately large tract (criteria C) and vegetation condition is natural (criteria E)	28 (a, b)
DIP land southeast of Mt Larcom: remnant near Larcom Creek (proposed flora site 29)	Regional	Remnant contains at least one Of Concern RE (criteria B1) (in this case 11.3.4)	29 (a, b)
DIP land southeast of Mt Larcom: finger of remnant poking out to the west of main remnant (proposed flora site 31)	Regional	Remnant contains at least one RE with 10–30% extent remaining (criteria B2) and remnant is part of a tract that is one of the largest of its type in the bioregion (criteria C)	31 (a, b, c)
Central Queensland Ports land: near the entrance to the Comalco property (flora sites 32, 33, 34)	Local and or Other Values	Remnant contains Core Habitat for Priority Taxa (criteria H) *Diagnostic data* for additional information,: Non-core habitat for EVR species	32, 33, 34
Rio Tinto land: end of existing overland pipeline (flora site 35)	State	Remnant contains at least one Endangered RE (criteria B1), remnant contains Core Habitat for Priority Taxa (criteria H)	35
Central Queensland Ports land: near the quarry (flora site 38)	Regional	Remnant is part of a tract that is one of the largest of its type in the bioregion (criteria C) and vegetation condition is natural (criteria E) and remnant has Ecosystem diversity in the top quartile (criteria F), remnant contains Core Habitat for Priority Taxa (criteria H) (note that these remnants come in from the north)	38

Area/Location	Level of significance	Description of criteria*	Sample site if applicable
Yarwun area near the crossroads: (westernmost end of remnant)	Local and/or Other Values, and State	Remnant forms part of a bioregional corridor (criteria J)	39a
Yarwun area: (higher part of remnant)	Regional	Contains at least one Of Concern RE (criteria B1)	39a
	State	Remnant forms part of a bioregional corridor (criteria J)	
Yarwun area (easternmost end of remnant)	Local and or Other Values	Remnant contains Core Habitat for Priority Taxa (criteria H)	39a

** BPA Criteria are environmental values that are used internally by EPA for planning purposes. They are explained in Appendix E2.*

The summary of BPA (EPA 2005c) mapping in Table 6.5 is consistent with field observations. Each sample site was located within areas of remnant vegetation identified as homogenous by the BPA.

The consistent values within the Description of Criteria (as outlined in the BPA) for the study area were:

- Wetland
- Significant RE (Of Concern or Endangered present, or RE is poorly represented in the sub-region[3])
- Large tract of vegetation
- Bioregional corridor
- Core Habitat for Priority Taxa.

Note that Core Habitat for Priority Taxa in Table 6.5, that were listed for land belonging to Gladstone Ports Corporation (formerly Central Queensland Ports Authority) and Rio Tinto (as sampled by Sites 32, 33, 34, 35, 38) were scrub species as part of softwood scrub REs (in this case RE 11.11.5 and RE 11.11.18) which were not present within the ROW or the corridor. This is an artefact of the RE mapping, where large pre-clearing vegetation polygons are a mosaic of different REs, and in this case the scrub REs are present elsewhere within other remnant polygons.

The Raglan Creek area, represented by Site 17, had Special Biodiversity Values (Table 6.5), and these relate to wildlife habitat.

The Yarwun area (easternmost end of remnant) represented by Site 39a, has Core Habitat for Priority Taxa (see Table 6.5). This refers to the tree cycads, which may be present in the area (*Cycas megacarpa* and *C. ophiolitica*).

6.6.6 Crops

A variety of crops, particularly annuals, were observed on the "black soil" in the Gracemere area. This land is Vulnerable to weed infestation particularly by Parthenium and Fireweed. Land east and south of Gracemere, as far south as Darts Creek, was predominantly used for grazing. Land south of Darts Creek was hillier and more heavily forested. The cleared areas were used mainly for grazing. There was no intensive forestry industry in the immediate area (except plantation areas southeast of Mt Larcom), and much of the forested areas were observed to be used for residential acreage lots and hobby farms. There was some horticultural activity (e.g. avocadoes southeast of Mt Larcom) but this was not within the corridor.

6.6.7 Weeds

Significant weeds known to occur within the project area and their impacts and management issues are listed in Table 6.6. These are not the only weeds likely to be present in the project area.

3 A sub-region is a subset of a bioregion.

Table 6.6 Significant Weeds within the Project Area

Common name	Botanical name	Declared class*	Problems caused	Distribution and likelihood of occurrence
Parthenium	Parthenium hysterophorus	2	Out-competes pasture and crops, spread by wind and also mud on vehicles and machinery	Northern areas on black soil. Heavy infestations around Gracemere
Giant Rats-tail Grass	*Sporobolus* spp. including *S. pyramidalis, S. jacquemontii, S. fertilis*	2	Out-competes pasture and crops, spread by wind and also mud on vehicles and machinery	South of Mt Larcom, especially Larcom Creek. Heavy infestations around Larcom Creek
Rubber Vine	Cryptostegia grandiflorus	3	Restricts access. Generally spread by wind	Widespread along corridor, especially in riverine areas and near Brigalow. Bad infestations in the Darts Creek area
Fireweed	Senecio madagascariensis	2	Out-competes pasture and crops, spread by wind and also mud on vehicles and machinery	Northern areas on black soil. Heavy infestations around Gracemere
Harrisia	*Harrisia* spp.	2	Injures stock. Mainly spread by fragments	Widespread along corridor, especially in riverine areas and near Brigalow
Prickly Pear	*Opuntia* spp. other than *O. ficus-indica*	2	Restricts access. Mainly spread by fragments	Widespread along corridor, especially in riverine areas and near Brigalow
Mother of Millions	*Bryophyllum* spp.	2	Toxic to stock. Mainly spread by fragments.	Widespread along corridor, often on poorer soils, and often with Grey Box forest
Lantana	Lantana camara	3	Restricts access. Mainly spread by birds	Widespread along corridor, but particularly in forested areas and in riverine areas. Bad infestations in the Darts Creek area
Leucaena	Leucaena leucocephala	n/a	Out-competes pasture and crops, spread by wind and also mud on vehicles and machinery. Restricts access	More common in northern areas on black soil. Some infestations around Gracemere

**Declared Pest Plant listed in the* Land Protection (Pest and Stock Route Management) Act 2002*:*
Class 3 plants only need to be controlled if adjacent to an environmentally significant area.

All significant weeds (as listed in Table 6.6), except one, known to occur within the project area, are Declared Pest Plants as listed in the *Land Protection Act.*

Severe weed infestations were not generally observed on the corridor, although Rubber Vine (*Cryptostegia grandiflora*) was observed to be widespread, particularly from Bajool to Ambrose. Fireweed (*Senecio madagascariensis*) was dense and widespread at the time of the second survey in August/September 2007, in the "black soil" country around Gracemere. Parthenium (*Parthenium hysterophorus*) was observed occasionally around the northern end of the corridor. Giant Rats-tail Grass (a number of *Sporobolus* spp.) occurred in particularly large and dense infestations in low-lying areas around Larcom Creek.

Leucaena (*Leucaena leucocephala*) is grown as a crop in the Gracemere area, and small weed occurrences were occasionally seen in that area, including roadsides. Although not a Declared Pest Plant, Leucaena could pose a threat to wetlands in the area, because of the level of disturbance associated with water bodies (Walton 2003). In its early growth stage Leucaena has a general resemblance to two or more native species frequently encountered in wetlands (*viz.* Budda Pea *(Aeschynomene indica)* and Sesbania *(Sesbania cannabina)*) hence assessment of infestation, and planning for control measures, need to be done with appropriate care.

6.6.8 Summary of Ecological Values

The following key vegetation and floristic features of the corridor are those that are of ecological concern due to conservation status under State or Commonwealth legislation, or other value. All sample sites were located on, or as close as possible, to the ROW (generally 30 m width).

6.6.8.1 Fitzroy to Bajool

A wetland of good condition was observed on Lot 105 LN176 (see Figure 6.1, detailed site 2). The wetland was inundated at the time of survey, with waterbirds present, and limited weed infestation. An area of mapped wetland also occurred on Lot 102 LN176.

6.6.8.2 Bajool to Gladstone

- A 200 m stretch of low-growing Brigalow (*Acacia harpophylla*) with extensive gilgai (small waterholes) on the south side of Inkerman Creek on Lot 68 DS141 (refer to Detailed site 9c)
- An advanced regrowth patch of Brigalow (*Acacia harpophylla*) approximately 100 m west of the road (on Lot 69 DS141) may be intersected by the corridor but is likely to be outside of the ROW by approximately 80 m (refer to Brief site 9b)
- A remnant of mostly low Brigalow (*Acacia harpophylla)* (probably regrowth) and some Belah (*Casuarina cristata*) off the Toonda Port Alma Road, on Lot 98 DS186 and Lot 99 DS186 (refer to Detailed sites 10a and 10b, and Short site 10c)
- Marble Creek had softwood scrub in good condition, with diverse species composition, in a gallery along the creek banks on Lot 28 DS37 (refer to Detailed site 14). There was one individual found here, identified as probably Ooline (*Cadellia pentastylis*). As a Vulnerable species (listed under the EPBC Act and the NC Act), this constitutes an EPBC Act referral trigger
- Extensive areas of mangroves occur at Horrigan Creek (refer to Short sites 16a and 16b) and Raglan Creek (refer to Short site 17)
- Land extending from Mt Larcom to the east for an extensive distance (to Aldoga) had restricted access. It is possible that the RE mapping needs to be revised in this area to account for unmapped Narrow-leafed Ironbark (*Eucalyptus crebra)* (most likely RE 11.11.15) (refer to proposed Detailed site 31)
- Riverine Blue Gum (*Eucalyptus tereticornis)* and rainforest on Boat Creek (refer to Short site 40)
- Individual tree cycads (*Cycas megacarpa* and *C. ophiolitica*) may be encountered in the coastal ranges around Yarwun (in the vicinity of Detailed site 39a).

6.7 Description of Impacts

6.7.1 Main Potential Impacting Processes

6.7.1.1 Main Potential Impacting Processes

The main potential impacting processes to terrestrial flora associated with the clearing of the (generally) 30 m wide ROW and construction of the pipeline are:

- Clearing of vegetation remnants
- Reduction of flora species habitat
- Removal of individual species of significance
- Reduction of wildlife corridor functionality
- Remnant vegetation edge effects
- Riparian vegetation disturbance
- Weed introduction.

6.7.1.2 Activities Causing Impacts

The activities which may cause the impacts listed in Section 6.6.1.1 are:

- Felling of individual trees
- Clear-felling of stands of trees, and increasing edge effects such as wind and weed penetration
- Bulldozing of shrubby areas
- Trenching across ephemeral wetlands and creeks, specifically including clearing either side of the trench
- Digging pits on either side of wet creeks for entry and exit of underground boring
- Possible accidental introduction of weeds to a site.

6.7.2 Remnant Vegetation Communities

6.7.2.1 Fitzroy to Bajool

The potential impacts on vegetation remnants along the corridor are listed in Table 6.7.

6.7.2.2 Bajool to Gladstone

With reference to the site numbers in Section 6.6.2.3, the impacts on vegetation remnants along the corridor are listed in Table 6.8.

Table 6.7 Impacts on Vegetation Remnants Along the Corridor (Fitzroy to Bajool section)

Site number (as per Section 6.5.2.2) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.2 for detailed description)	Impact prior to mitigation (not residual impact)
1	Extraction point on the Fitzroy River	Removal of several trees on bank
Brief 160, 161 and 163	Northwest of Rockhampton: Rockhampton Ridgelands Road and Alton Downs Nine Mile Road	Clearing of trees on two road reserves
2	Wetland past the end of Tyrrell Road	Trenching across part of the wetland is likely to cause temporary loss of aquatic plants, and possibly turbidity
3a	Very open woodland near the T-junction of Malchi Nine Mile Road and Fairy Bower Road	Possible removal of several trees
Short 4	Softwood scrub close to the corridor on Malchi Nine Mile Road	Partial clearing of scrub would only occur if the ROW were extended across existing road. If the corridor is located on the other side of the road, and this is the current intention, then no scrub will need to be cleared
Brief 185	Unmapped areas of mostly cleared riverine rainforest on Fairy Bower Road	Possible removal of several trees
5	Small wetland north of Fairy Bower Road off Fogarty Road	Trenching across part of the wetland would cause temporary loss of aquatic plants, and possibly turbidity
Brief 191 and 192	Other wetlands in the Fairy Bower area, just south of the Capricorn Highway	Trenching across part of the wetland, is likely to cause temporary loss of aquatic plants, and possibly turbidity
6a	Gavial Creek	Trenching may involve clearing of some riverine vegetation, mostly trees (Blue Gum (*Eucalyptus tereticornis)* and River Oak *(Casuarina cunninghamiana*))
Short 6b	Road reserve near the intersection of Roope Road and River Road	Possible removal of several trees
Short 6c and 6d	Road reserves of Georges Road and Casuarina Road	Clearing of trees on two road reserves
Brief 10, 11 and 12	Very open woodlands of Poplar Box *Eucalyptus populnea* may be intersected north of Bajool	Possible removal of several trees
Short 7, 8a and 8b (all upstream)	Bob's Creek, Station Creek and Oakey Creek	Trenching may involve clearing of some riverine vegetation, mostly trees (Blue Gum (*Eucalyptus tereticornis)* and River Oak *(Casuarina cunninghamiana*))

Table 6.8 Impacts on Vegetation Remnants Along the Corridor (Bajool to Gladstone section)

Site number (as per Section 6.5.2.2) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.2 for detailed description)	Impact prior to mitigation (not residual impact)
Short 9a	Inkerman Creek	Micro-tunnelling will be undertaken at this site due to clay substrate, tidal drainage and presence of mangrove species. Some vegetation may need to be removed at tunnel entry and exit points, but most or all mangroves will be retained
Short 9b	Brigalow approximately 100 m west of the Toonda Port Alma Road	Pipeline and ROW will not interfere with remnant, but associated construction activities could damage remnant
9c	Low-growing Brigalow on the south side of Inkerman Creek	Complete clearing of vegetation within area needed for pipeline and ROW
Short 10a, 10b, and 10c	Brigalow-belah off the Toonda Port Alma Road, on Lot 98 DS186 and Lot 99 DS186	Pipeline and ROW will probably require clearing at southern end of remnant (mostly low regrowth and Rubber Vine), but associated construction activities could damage remnant
Brief 19 and 21	Regrowth areas of diverse scrub-related species on Lot 101 DS185 and Lot 102 DS185	Complete clearing of vegetation within area needed for pipeline and right-of-way.
Approx. 1 km south of Brief 19 and 21	Scattered mature gums south of the area of scrub regrowth (mentioned above) on Lot 8 DS185	Possible removal of several trees
11b	Eucalypt regeneration area along a marine drainage north of the Twelve Mile Road	Possible removal of several mature trees, and removal of a number of planted juvenile trees in regeneration area
Short 11c	Twelve Mile Creek	Open trenching at this crossing may require the removal of several trees
12	Road reserve on Twelve Mile Road	Possible removal of several trees
13 (Short)	Patch of remnant softwood scrub in good condition on the same road, but adjacent to the corridor	Pipeline and ROW will not interfere with remnant, but associated construction activities could damage remnant
14	Marble Creek	Open trenching at this crossing may require the removal of several trees. (Note: crossing point will be limited to gap in remnant vegetation. This point has been surveyed and no Rare or Threatened species were encountered). Significant vegetation occurs in adjacent areas
Short 16a, 16b and 17	Raglan and Horrigan Creeks	Micro-tunnelling will be undertaken at this site due to clay substrate, tidal drainage and presence of mangrove species. Some vegetation may need to be removed at tunnel entry and exit points, but most or all mangroves will be retained
18a	Corridor runs between southern end of large remnant of Narrow-leafed Ironbark on Lot 36 DT40169, and northern end of wetland	Possible removal of several trees from edge of remnant
Short 18b	Road reserve on Reedy Creek Road	Clearing of trees on road reserve
Short 20	Advanced regrowth with some scattered original trees on Lot 162DS61	Complete clearing of vegetation within area needed for pipeline and ROW
Short 21, Detailed 22a and 22b	Remnant forest around Darts Creek Road	Clearing is proposed to occur at the edge of this remnant, causing further reduction and fragmentation of a large remnant. This would reduce its ecological value in terms of size. Widening of existing fence-line access track, involving complete clearing of vegetation within area needed for pipeline and ROW

Site number (as per Section 6.5.2.2) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.2 for detailed description)	Impact prior to mitigation (not residual impact)
23	Grey Box on Lot 114 DS256 and Lot 6 RP214228	This is a new cleared easement, so the initial damage to an otherwise large intact vegetation remnant is noteworthy. Complete clearing of vegetation within area needed for pipeline and ROW
24	Horseshoe Lagoon	Only affected if corridor follows this optional route, and only then if adjoining forest is cleared, thus reducing buffer and possibly introducing weeds
Short 25	Cleared extension of what could possibly be a natural grassland	No clearing needed, but weeds could be introduced from earthworks
Short 27	Grey Box regrowth northeast of the showground at Mt Larcom	Complete clearing of vegetation within area needed for pipeline and ROW
Short 28a and 28b	Two Grey Box remnants between Mt Larcom Gladstone Road and Larcom Creek	Possible removal of several trees or small clumps from edge of remnant
Short 29a and 28b	Large Grey Box remnant north of Larcom Creek – this one closer to the creek	Possible removal of several trees or small clumps from edge of remnant
Short 29c	Minor tributary on northern side of Larcom Creek	Possible removal of some trees (probably *Eucalyptus tereticornis* and *Casuarina cunninghamiana*)
Short 30a, 30b and 30c	Larcom Creek and minor tributaries	Open trenching at this crossing may require the removal of several trees (probably Blue Gum and River Oak)
Short 31a, 31b and 31c	Remnant Blue Gum, Ironbark and minor tributaries	Complete clearing of vegetation within area needed for pipeline and ROW. Much is already cleared for existing services
32, 33 and 34	Large intact remnant of eucalypt forest	Complete clearing of vegetation within area needed for pipeline and ROW. Much is already cleared for existing services
Short 35	Not Of Concern remnant of eucalypt forest (other parts of remnant elsewhere include Endangered RE)	Complete clearing of vegetation within area needed for pipeline and ROW. Some is already cleared for existing services
Detailed 36, 37a and 37b and Short 38	Eucalypt woodland and very small patch of scrub species northwest of quarry	Complete clearing of vegetation within area needed for pipeline and ROW. Some is already cleared for existing services. Vegetation is in poor condition and group of scrub species does not constitute a community, nor are there any Threatened species present
Detailed 39a and Short 39b	Large eucalypt remnant east of Yarwun	Complete clearing of vegetation within area needed for pipeline and ROW. Some is already cleared for existing services. It is possible that the Endangered tree cycads (*Cycas megacarpa* and/or C. *ophiolitica*) occur within the area proposed to be cleared
Short 40	Boat Creek	No proposals for crossing this creek, but removal of adjacent vegetation would remove buffer

6.7.2.3 Summary of Significant Impact Criteria for *EPBC Act* Endangered Ecological Communities

Table 6.9 lists those relevant Ecological Communities which are classified as Endangered under the EPBC Act and responses to the Significant Impact Criteria as described within the EPBC Act *Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance (May 2006).* None of the Significant Impact Criteria will be met as a result of the project, but the reduction in area of a low-growing patch of Brigalow may occur. The structural form of this patch of Brigalow does not meet the requirements for classification as remnant under the VM Act, nor the EPBC Act, which uses the structural classification of the VM Act.

6.7.3 Rare and Threatened Species

6.7.3.1 Whole of Right of Way

Endangered (under the NC Act and EPBC Act) scrub species are of greatest concern in regard to the impact of the corridor. These scrub species are most likely to occur in RE 11.11.18, as this defines lowland scrub on metamorphic sediments. Scrub in the project area is not necessarily restricted to this RE, depending on geological substrate and species assemblage. Table 6.4 shows the likelihood of occurrence of targeted Threatened species along the corridor, of which the most likely species are scrub species. Due to the species diversity within scrub remnants, it is not possible to assess the relative likelihood of impact to specific scrub species, without exact knowledge of the proposed location of the pipeline (i.e. within a few metres)[4], and extensive survey of all scrub species along that line. It is considered unlikely that adult (mature) scrub species will be disturbed in the ROW. Scrub on Marble Creek had the greatest likelihood of impact, but the crossing point was surveyed and no Rare or Threatened species were observed at that point. There are areas of scrub regrowth within the ROW that will be cleared, but these species are not advanced in growth (i.e. usually less than 1 m high), and it is unlikely that these will be of sufficient growth form to warrant avoiding.

Black Ironbox (*Eucalyptus raveretiana*) is considered unlikely to occur in riverine locations along the corridor, but it is still possible that individuals may be encountered. These individuals are therefore at risk of removal or damage if not identified before trenching, boring or clearing operations take place.

6.7.3.2 Fitzroy to Bajool

Wetlands are the ecosystems which will be most impacted along this section of the corridor. All wetlands in this area are to be trenched through, rather than bored under, because of their ephemeral nature (and size, in some cases). The wetlands impacted are identified in Table 6.7. No Threatened wetland species were identified for the project area from the EPBC Act Protected Matters Report, nor from Wildlife Online (see Table 6.3).

Scrub species could potentially be impacted along this section of the corridor. Refer to Section 6.7.3.1 for impacts to these species.

6.7.3.3 Bajool to Gladstone

Although Brigalow (*Acacia harpophylla*) regrowth may occur immediately south of Inkerman Creek, it constitutes a Threatened Ecological Community under the EPBC Act (if of sufficient structure), but the species as an individual is not listed as Threatened.

Two tree cycads (*Cycas megacarpa* and *C. ophiolitica*) are known to occur in areas that may be intersected by the proposed corridor. They are Endangered under the NC Act and EPBC Act, and could be impacted through removal and/or disturbance of vegetation.

Scrub species could potentially be impacted along this section of the corridor, through removal and/or disturbance of vegetation. Refer to Section 6.7.3.1 for impacts to these species.

[4] Note that Table 6.4 identifies the likelihood of occurrence of habitat for specific scrub species as fair, but only within remaining scrub remnants.

Table 6.9 Summary of Significant Impact Criteria for EPBC Act *Endangered Ecological Communities*

Endangered Ecological Communities		Response to Significant Impact Criteria						
		#1	#2	#3	#4	#5	#6	#7
Brigalow (*Acacia harpophylla* dominant and co-dominant)		No*	No	No	No	No	No	No
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar bioregions		No	No	No	No	No	No	No
*refer to discussion on the classification of Brigalow structure for Site 9c in Section 6.5.2.3								
Significant Impact Criteria								
Criterion 1	Reduce the extent of an ecological community							
Criterion 2	Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines							
Criterion 3	Adversely affect habitat critical to the survival of an ecological community							
Criterion 4	Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns							
Criterion 5	Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting							
Criterion 6	Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • Assisting invasive species that are harmful to the listed ecological community, to become established • Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community							
Criterion 7	Interfere with the recovery of an ecological community							

Table 6.10 Summary of Significant Impact Criteria for Reported EPBC Threatened Flora Species

Threatened Species	Status	Response to Significant Impact Criteria								
		#1	#2	#3	#4	#5	#6	#7	#8	#9
Atalaya collina	E	No	No	No	No	No	No	No	No	No
Bosistoa selwynii	V	No	No	No	No	No	No	No	No	No
Bosistoa transversa	V	No	No	No	No	No	No	No	No	No
Bulbophyllum globuliforme	V	No	No	No	No	No	No	No	No	No
Corymbia xanthope	V	No	No	No	No	No	No	No	No	No
Cupaniopsis shirleyana	V	No	No	No	No	No	No	No	No	No
Eucalyptus raveretiana	V	No	No	No	No	No	No	No	No	No
Leucopogon cuspidatus	V	No	No	No	No	No	No	No	No	No
Parsonsia larcomensis	V	No	No	No	No	No	No	No	No	No
Quassia bidwillii	V	No	No	No	No	No	No	No	No	No
Cadellia pentastylis*	V	No	No	No	No	No	No	No	No	No

Significant Impact Criteria	
Criterion 1	Lead to a long-term decrease in the size of an important population of a species
Criterion 2	Reduce the area of occupancy of an important population
Criterion 3	Fragment an existing important population into two or more populations
Criterion 4	Adversely affect habitat critical to the survival of a species
Criterion 5	Disrupt the breeding cycle of an important population
Criterion 6	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
Criterion 7	Result in invasive species that are harmful to a Vulnerable species becoming established in the Vulnerable species' habitat
Criterion 8	Introduce disease that may cause the species to decline
Criterion 9	Interfere substantially with the recovery of the species

* This species was not originally targeted, but was observed (identified as probably Ooline) during the survey.

6.7.3.4 Summary of Significant Impact Criteria for EPBC Threatened Flora Species

Table 6.10 lists those relevant flora species which are classified as Endangered or Vulnerable under the EPBC Act and responses to the Significant Impact Criteria as described within the EPBC Act *Policy Statement 1.1 Significant Impact Guidelines – Matters of National Environmental Significance* (May 2006). None of the Significant Impact Criteria will be met as a result of the project.

6.7.3.5 Summary of Rare and Threatened Species Impacts

It is unlikely that Rare and Threatened species will be encountered along the corridor, during removal and/or disturbance of vegetation with the possible exception of Ooline (*Cadellia pentastylis*). Table 6.10 shows that none of the Significant Impact Criteria (under the EPBC Act) will be met as a result of the project.

6.7.4 Cultural Impacts

6.7.4.1 Crops

In the Alton Downs easement there are irrigated crops on a property that is crossed by the alignment. Cropping areas around Gracemere may also be adversely impacted in the short term. Cropping will be disrupted over part of each affected property. The majority are annual crops, so cropping within the corridor should return to normal in the following season.

6.7.4.2 Recreational areas

Raglan Creek has a public access area which appears to be heavily utilised. The anticipated loss of a section of mangroves may have adverse medium-term effects on recreational use in terms of aesthetic amenity. The Fitzroy River, however, does not have a public access area in the ROW.

6.8 Mitigation and Residual Impacts

This section discusses the mitigation measures that will be implemented to minimise the potential impacts identified in Section 6.6, including aspects such as design (e.g. pipeline alignment), seeking advice on the construction method from an environmental advisor, and the use of offsets. Further mitigation measures are identified in the Planning Environmental Management Plan (EMP) in Chapter 20, Planning Environmental Management Plan. Residual impacts and the severity of impacts are also identified.

6.8.1 Assessment of Impact Severity

Table 6.11 defines the significance criteria used for assessing impacts and is specifically adapted here to assess impacts on terrestrial flora.

6.8.2 Remnant Vegetation Communities

6.8.2.1 Fitzroy to Bajool

The impacts on vegetation remnants along the corridor are listed in Table 6.12. The severity of the impact on each remnant is also listed, based on the significance criteria in Table 6.11.

Table 6.11 Significance Criteria for Residual Impacts

Significance	Criteria
Major adverse	Extensive or acute disturbance (major impact) occurring at a site of national importance, which results in the lowering of its ecological value. Also, direct or indirect adverse impact on an area (e.g. national park, Threatened Ecological Community under the EPBC Act etc.) to the extent that its designation is potentially compromised, or the populations it supports or represents are materially reduced. Adverse effects on nationally or internationally protected species endangering their conservation status (e.g. Threatened species under the EPBC Act)
High adverse	Irreversible loss or damage to a substantial part of the regional distribution, or the majority of the local distribution of a habitat type, community or population of flora (e.g. Threatened Ecological Community under the EPBC Act, Endangered RE under the VM Act etc.). Long-term disturbance effects to populations or plant species protected by national or state legislation (e.g. Threatened species under the EPBC Act or the NC Act)
Moderate adverse	Extensive or acute disturbance (major impact) to a significant site in a Local Government Authority or equivalent area, resulting in its loss or the permanent lowering of its ecological value. Limited disturbance (moderate impact) to a regional (or equivalent) site where recovery is anticipated following completion of the works concerned. Lesser effects than major adverse on nationally Rare or protected species where mitigation measures are anticipated to alleviate adverse impacts
Minor adverse	Lesser loss or disturbance than moderate adverse (moderate impact) to a locally important site. Limited or temporary effects (minor impact) on National or Regional sites. Minor impacts on protected species, effects on plant communities without special protection, or nationally scarce plant species where mitigation measures are anticipated to alleviate adverse impacts
Negligible	Any impacts on resources considered to be of negligible ecological value, or effects on species or resources of value the effects of which, when they occur, are likely to be imperceptible. For example, loss of recently created artificial habitats (e.g. landfill sites, amenity grassland, intensive farmland, verge planting). Loss of an exotic species of flora
Beneficial	Any measures that are expected to result in an improvement of the quality of ecological resources following their completion. These can, for example, include creation of new habitat features or introduction of measures that would achieve improvements in quality at an existing ecological site. Design features or management activities, which would make a long-term contribution to ecological objectives, or measures to ensure the long-term protection of Threatened species, which may not be adversely affected by the project, are also included in this category

Table 6.12 Residual Impact Severity on Vegetation Remnants Along the Corridor (Fitzroy to Bajool section)

Site number (as per Section 6.5.2.2) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.2 for detailed description)	Mitigation (Refer to Table 6.7 for impacts prior to mitigation)	Residual impact severity
1	Extraction point on the Fitzroy River	Trees cleared from the bank with DBH* greater than 15 cm will be replaced in nearby areas within the same Lot by advanced planting stock of the same or similar species, a minimum of 1 m tall	Minor adverse
Brief 160, 161 and 163	Northwest of Rockhampton: Rockhampton Ridgelands Road and Alton Downs Nine Mile Road	Trees cleared on two road reserves with DBH* greater than 15 cm will be replaced with tube stock** on road reserve adjacent to corridor	Minor adverse
2	Wetland past the end of Tyrrel Road	When trenching across part of the wetland, topsoil will be stockpiled offsite from the wetland or within the ROW (i.e. not adjacent to the ROW), and replaced after works to enable ground layer species to re-establish. Unnecessary removal of trees with DBH* greater than 15 cm will be avoided, or replaced with tube stock** adjacent to corridor. If the trench is located far enough upstream, or if construction occurs when the wetland is dry in that area, then there may be negligible impact	Minor adverse
3a	Very open woodland near the T-junction of Malchi Nine Mile Road and Fairy Bower Road	Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible

Site number (as per Section 6.5.2.2) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.2 for detailed description)	Mitigation (Refer to Table 6.7 for impacts prior to mitigation)	Residual impact severity
Short 4	Softwood scrub close to the corridor (to the west) on Malchi Nine Mile Road	The ROW is located on east side of the road so it does not impact on the area	Negligible
Brief 185	Unmapped areas of mostly cleared riverine rainforest on Fairy Bower Road	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible assuming no large trees such as figs are removed
5	Small wetland north of Fairy Bower Road off Fogarty Road	Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible assuming the ROW is not extended into wetland
Brief 191 and 192	Other wetlands in the Fairy Bower area, just south of the Capricorn Highway	When trenching across the wetland topsoil will be stockpiled and replaced after works to enable ground layer species to re-establish. Unnecessary removal of trees with DBH* greater than 15 cm will be avoided or replaced with tube stock** adjacent to corridor	Minor adverse
6a	Gavial Creek	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Minor adverse
Short 6b	Road reserve near the intersection of Roope Road and River Road	Any trees cleared on road reserve with DBH* greater than 15 cm will be replaced with tube stock** on road reserve adjacent to corridor	Negligible
Short 6c and 6d	Road reserves of Georges Road and Casuarina Road	Trees cleared on two road reserves with DBH* greater than 15 cm will be replaced with tube stock** on road reserve adjacent to corridor	Minor adverse
Brief 10, 11 and 12	Very open woodlands of Eucalyptus populnea may be intersected north of Bajool	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible
Short 7, 8a and 8b (all upstream)	Bob's Creek, Station Creek and Oakey Creek	Any trees greater than 15 cm DBH* will be replaced with tube stock** in same paddock but adjacent to corridor	Minor adverse

**DBH tree trunk Diameter at Breast Height (approx. 1.3 m from ground). The outer bark is included.*
***Where tube-stock is available and suitable planting areas are available. Tube-stock are small containers chosen for cost effectiveness and their ability to rapidly catch up in growth to larger stock. They are only suitable in areas where they cannot be disturbed, i.e. by cattle trampling or weed overgrowth. They are protected by tree guards for at least the first year (normally three stakes and a plastic tube-bag).*

The impacts shown in Table 6.12 are mostly of **negligible** or **minor adverse** significance, and further mitigation measures are outlined in Chapter 20, Planning Environmental Management Plan.

6.8.2.2 Bajool to Gladstone

The impacts on vegetation remnants along the corridor are listed in Table 6.13. The severity of impact on each remnant is also listed, based on the significance criteria in Table 6.11.

Table 6.13 Residual Impact Severity on Vegetation Remnants Along the Corridor (Bajool to Gladstone section) See Figure 6-1 for Site Locations and Appendix E2- Terrestrial Flora for further detail of locations.

Site number (as per Section 6.5.2.3) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.3 for detailed description)	Mitigation (Refer to Table 6.8 for impacts prior to mitigation)	Residual impact severity
Short 9a	Inkerman Creek	Commence boring/drilling outside of mangrove vegetation zone Minimise clearing width through adjacent vegetation (Brigalow immediately south) Trees (mangroves at this location) will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor. Mangrove removal will be minimised and/or avoided as much as possible	Negligible assuming bore/ drill entry points are located away from trees
Detailed 9c	Low-growing Brigalow on the south side of Inkerman Creek	Minimise width of clearing of vegetation within area needed for pipeline and ROW. There is an existing old narrow vehicle track that will be used for the ROW if possible. Total length of clearing is approximately 200 m, so it will be possible to reduce the clearing width so that two vehicles can pass during construction. Clearing to be strictly kept to a maximum of 15 m, with boundaries clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. If EPA determines that this community is of remnant status, hence Endangered, then all Brigalow plants that are removed will be partially buried in an adjacent waterlogged area to allow suckering and consequent regrowth	Minor adverse, but could be moderate adverse if EPA determines that this community is of remnant status, hence Endangered
Short 9b	Brigalow approximately 100 m west of the Toonda Port Alma Road	Pipeline and ROW are not likely to interfere with remnant. Access will be prohibited to the edge of this remnant to minimise the impact. Boundary of Brigalow ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted	Negligible
10a, 10b and Short 10c	Brigalow-belah off the Toonda Port Alma Road, on Lot 98 DS186 and Lot 99 DS186	It is likely that the pipeline and ROW will only interfere with edge of remnant, which is mostly fragmented or infested with Rubber Vine. Any clearing at the edge of this remnant will need to be minimised. The edge of the area to be cleared will be clearly marked, and access prohibited to the remaining area with poly-web fencing	Minor adverse
Brief 19 and 21	Regrowth areas of diverse scrub-related species on Lot 101 DS185 and Lot 102 DS185	Topsoil will be stockpiled, and replaced after works to help regrowth species to re-establish. Unnecessary removal of trees with DBH* greater than 15 cm will be avoided, or replaced with tube stock** adjacent to corridor	Negligible
Approx. 1 km south of Brief sites 19 and 21	Scattered mature gums south of the area of scrub regrowth (mentioned above) on Lot 8 DS185.	Trees will be avoided wherever possible. Any trees cleared with DBH greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible
11b	Eucalypt regeneration area along a marine drainage north of the Twelve Mile Road	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor. Any previously-planted juvenile trees in regeneration area that need to be removed will be replaced with tube stock of as similar a native species as possible	Minor adverse
Short 11c	Twelve Mile Creek	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible assuming mature trees are avoided

Site number (as per Section 6.5.2.3) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.3 for detailed description)	Mitigation (Refer to Table 6.8 for impacts prior to mitigation)	Residual impact severity
12	Road reserve on Twelve Mile Road	The environmental officer (an appropriately qualified member of the construction team, refer to Chapter 20, Planning Environmental Management Plan) will supervise exact trench location here if possible, to eliminate the need for unnecessary tree removal. Any trees cleared on road reserve with DBH* greater than 15 cm will be replaced with tube stock** on road reserve adjacent to corridor	Minor adverse
Short 13	Patch of remnant softwood scrub in good condition on the same road, but adjacent to the corridor	Pipeline and ROW are not likely to interfere with remnant. Boundary of scrub will be clearly marked along existing fence-line with continuous length of high-visibility poly-web fencing. Access to the areas will be prohibited to prevent risk of fire or other damage	Negligible
14	Marble Creek	Site inspection at the pipeline crossing point found that no significant vegetation would be affected by trenching, although significant vegetation occurs in adjacent areas. Site surveys by a suitably qualified botanist will occur prior to construction commencement. Removal of trees and shrubs will be minimised. Trenching will be confined to already-cleared or open areas wherever possible. Sediment and erosion control measures will be implemented to prevent impacts downstream (if construction occurs in the wet) Weed management plan will be implemented If Rare or Threatened sapling species are identified from samples taken on-site, these will be translocated with a permit from EPA. ROW will be narrowed to a maximum 10 m width across creek and creek banks. Any trees cleared with DBH* greater than 10 cm will be replaced with five tube stock** along same creek bank but in disturbed sections adjacent to corridor. Tube stock will be sourced from a local native nursery to maintain local provenance. Any trees with DBH* greater than 10 cm earmarked for removal will require identification by the environmental officer prior to removal. If the resulting species is EVR status, the pipeline will be slightly diverted to protect the tree. If the resulting species is not EVR, but not available from native nurseries, Greening Australia and local native nurseries will be contacted to be given the opportunity of using the removed tree as a source of propagation material.	Negligible assuming the continuity of the riverine gallery forest is preserved and EVR species are not damaged
Short 16a, 16b and 17	Raglan and Horrigan Creeks	Micro-tunnelling will be done under Raglan and Horrigan Creeks (Sites 16a and 17) due to aquatic ecology values, tidal drainage and presence of mangrove species. Drilling/boring will be commenced outside the riparian zone to avoid removal of mangroves. Open trenching will be done in the Site 16b area between the two creeks, as this is higher ground without mangroves.	Minor adverse
18a	Corridor runs between southern end of large remnant of Narrow-leafed Ironbark on Lot 36 DT40169, and northern end of wetland	Pipeline and ROW are not likely to interfere with remnant, except possibly a few trees at the edge. Boundary of remnant at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited, to prevent risk of fire or other damage.	Negligible to Minor adverse
Short 18b	Road reserve on Reedy Creek Road	Trees cleared on road reserve with DBH* greater than 15 cm will be replaced with tube stock** on road reserve adjacent to corridor	Minor adverse

Site number (as per Section 6.5.2.3) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.3 for detailed description)	Mitigation (Refer to Table 6.8 for impacts prior to mitigation)	Residual impact severity
Short 20	Advanced regrowth with some scattered original trees on Lot 162 DS61	Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor	Minor adverse
Short 21 and Detailed 22a and 22b	Remnant forest around Darts Creek Road	Clearing at the edge of this remnant will be minimised and the clearing edge will be clearly marked using poly-web fencing to prohibit access. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas. Additional replanting on eastern side cannot reduce impact from moderate to minor because ROW increases the width of the existing dissection of the remnant.	Minor adverse on western side of Darts Creek Road Moderate adverse on eastern side because remnant is in very good condition
23	Grey Box on Lot 114 DS256 and Lot 6 RP214228	Clearing at the edge of this remnant will be minimised, and the clearing edge will be clearly marked using poly-web fencing to prohibit access. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas. Additional replanting on eastern side cannot reduce impact from moderate to minor because ROW dissects the remnant	Moderate adverse
24	Horseshoe Lagoon	If final corridor alignment traverses this area or adjoining forest is cleared, buffer would be reduced and possibly weeds introduced. However, the corridor is not currently planned through this area. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Negligible
Short 25	Cleared extension of what could possibly be a natural grassland	Weed management plan to be implemented. Backfilled trench will be monitored to ensure that weeds do not establish along that section of the ROW to a point where they could spread into the grassland	Negligible
Short 27	Grey Box regrowth northeast of the showground at Mt Larcom	Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor	Minor adverse
Note: GSDA begins here			
Short 28a and 28b	Two Grey Box remnants between Mt Larcom Gladstone Road and Larcom Creek on DIP land	Pipeline and ROW are not likely to interfere with remnant, except possibly a few trees at the edge. Boundary of remnant at the edge of the ROW will be clearly marked will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor	Negligible to Minor adverse
Short 29a, 29b and 29c	Second of two Grey Box remnants north of Larcom Creek – this one closer to the creek	Pipeline and ROW are not likely to interfere with remnant, except possibly a few trees at the edge. Boundary of remnant at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited, to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor	Negligible to Minor adverse
Short 29c	Minor tributary on northern side of Larcom Creek	Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor	Negligible assuming trees can be avoided

Site number (as per Section 6.5.2.3) Sites are Detailed unless otherwise specified	Brief remnant description (see Section 6.5.2.3 for detailed description)	Mitigation (Refer to Table 6.8 for impacts prior to mitigation)	Residual impact severity
Short 30a, 30b and 30c	Larcom Creek and minor tributaries on DIP land	Open trenching to be done here, as riparian vegetation can be avoided to some extent. Trenching will be confined to previously cleared or open areas wherever possible. Trees will be avoided wherever possible. Any trees cleared with DBH* greater than 15 cm will be replaced with tube stock** in same paddock but adjacent to corridor. Weed management plan will be implemented to ensure spread or establishment of Giant Rats-tail Grass does not occur on terraces surrounding creek.	Negligible assuming mature trees are avoided and Giant Rats-tail Grass infestations do not occur
Short 31a, 31b and 31c	Remnant Blue Gum, Ironbark and minor tributaries at eastern edge of DIP land	Pipeline and ROW are likely to interfere with edge of remnants only. Boundary of remnants at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. No entry to the remnant area will be permitted, to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Minor adverse
32, 33 and 34	Large intact remnant of eucalypt forest on Ports Corporation land	Pipeline and right-of-way are likely to interfere with edge of remnants only. Boundary of remnants at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Minor adverse
Short 35	Not Of Concern remnant of eucalypt forest on Rio Tinto land (other parts of remnant elsewhere include Endangered RE)	Pipeline and ROW are likely to interfere with edge of remnants only. Boundary of remnants at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited, to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Minor adverse
Detailed 36, 37a and 37b and Short 38	Eucalypt woodland and very small patch of scrub species northwest of quarry	Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Minor adverse
Detailed 39a and Short 39b	Large eucalypt remnant east of Yarwun	Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas. If individuals of the Endangered tree cycads (*Cycas megacarpa and/or C. ophiolitica*) are encountered, they will be translocated adjacent to corridor (with a permit from EPA), according to translocation protocols in the EMP. The environmental officer will be on-site during construction to ensure that these plants are not damaged or removed	Minor adverse
Short 40	Boat Creek	The riverine forest community will be avoided wherever possible. Boundary of remnant at the edge of the ROW will be clearly marked with 2 m lengths of high-visibility poly-web fencing, with 10 m gaps permitted. Access to the remnant area will be prohibited, to prevent risk of fire or other damage. Trees cleared with DBH* greater than 15 cm will be replaced with tube stock** adjacent to corridor in disturbed areas	Negligible to Minor adverse

**DBH is tree trunk Diameter at Breast Height (approx. 1.3 m from ground). The outer bark is included.*
***Tube stock are small containers chosen for cost effectiveness and their ability to rapidly catch up in growth to larger stock. They are only suitable in areas where they cannot be disturbed by cattle trampling, weed overgrowth etc. They are protected by tree guards for at least the first year (normally three stakes and a plastic tube-bag).*

The impacts shown in Table 6.13 are mostly of **negligible** or **minor adverse** significance, and can be offset by appropriate rehabilitation procedures which are outlined above for specific sites. Further measures are described in the Planning EMP in Chapter 20, Planning Environmental Management Plan, and will be elaborated in the Construction EMP to be developed by the contractor prior to construction.

6.8.3 Rare and Threatened Species

6.8.3.1 General

As discussed in Section 6.6.3, construction (and operation) of the pipeline may impact on Endangered (under the NC Act and the EPBC Act) scrub species that may occur within the proposed corridor, but it is not possible to assess the relative likelihood of impact to specific scrub species without exact knowledge of the pipeline location (i.e. within a few metres)[5]. Mitigation measures that will be implemented to minimise the potential impact to Endangered scrub species include:

- A pre-construction survey of all scrub communities at the time the ROW is surveyed, focusing on the identification of Threatened Species along the proposed ROW (see Chapter 20, Planning Environmental Management Plan, for proposed vegetation clearing practices)
- Areas of remnant vegetation impacted by the alignment will be highlighted on all drawings and clearly marked in the field
- Potential minor realignment of the ROW where possible (i.e. a few metres to go around trees or shrubs)
- Clearing boundaries will be clearly delineated on all drawings and in the field to define the extent of authorised clearing, which will not exceed the construction area.

Where these mitigation measures are implemented, along with the requirements in Chapter 20, Planning Environmental Management Plan, there is likely to be a **negligible** impact to scrub species along the corridor.

Black Ironbox (*Eucalyptus raveretiana*) is considered unlikely to occur in riverine locations along the corridor, but it is still possible that individuals may be encountered. Mitigation measures to minimise the impact will include a pre-construction survey for Black Ironbox individuals, and potential minor realignment of the ROW (i.e. a few metres to go around individual). There is likely to be a **negligible** impact to this species with the implementation of the above mitigation measures.

[5] Note that Table 6.4 identifies the likelihood of occurrence of habitat for specific scrub species as fair, but only within remaining scrub remnants.

6.8.3.2 Fitzroy to Bajool

Wetlands that potentially provide habitat for Threatened wetland species and are likely to be impacted by the construction of the proposed pipeline are identified in Table 6.7 (refer to Table 6.4 for likelihood of occurrence of Threatened species). While trenching is proposed for wetlands in this area because of their ephemeral nature (and size, in some cases), the implementation of the following mitigation measures will minimise the potential impact:

- When trenching across part of the wetland, topsoil will be stockpiled, and replaced after works to enable ground layer species to re-establish; and
- Wetlands will be restored, particularly for Site 2 (refer Table 6.12).

Where these mitigation measures are implemented, along with the requirements outlined in the Planning EMP (see Chapter 20, Planning Environmental Management Plan), there is likely to be a **negligible** impact to Threatened wetland species.

6.8.3.3 Bajool to Gladstone

Section 6.6.3.3 outlines the potential occurrence of, and impact to, Brigalow (*Acacia harpophylla*) regrowth (or possibly stunted remnant) immediately south of Inkerman Creek. While the species (as an individual) is not listed as Threatened, the community may constitute a Threatened Ecological Community under the EPBC Act (if of sufficient structure). Mitigation measures and residual impacts for this community (located at Site 9c) are identified in Table 6.13.

Two tree cycads (*Cycas megacarpa* and *C. ophiolitica*, Endangered under the NC Act and EPBC Act), known to occur within the proposed corridor, may be impacted through removal and/or disturbance of vegetation in the ROW. Mitigation measures to minimise the potential impact on these species includes the avoidance of clearing in remnant vegetation, or where this is not possible, translocation of impacted individuals (as per Forster (2007)). Requirements outlined in the EMP (Section 6.7.5) would also be implemented. Refer also to Sites 39a and 39b in Table 6.13. There is likely to be a **negligible** impact to Threatened cycad species through implementation of these measures.

6.8.3.4 Summary of Rare and Threatened Species Impacts

While it is considered unlikely that Rare and Threatened species along the corridor will be impacted by the proposed project, pre-construction surveys will be conducted. When any Rare or Threatened individuals remain within the construction footprint, these can be translocated (or replacements planted, depending on species) in consultation with EPA, resulting in a **negligible** residual impact.

6.8.4 Cultural Impacts

6.8.4.1 Crops

Cropping areas around Gracemere and in Alton Downs are likely to be adversely impacted in the short term. Cropping will be disrupted over part of each affected property. The majority are annual crops, so cropping within the corridor should return to normal in the following season. There may be a **minor adverse** impact to cropping, but this would more likely be **negligible** subject to financial license arrangements in the SGIC.

No areas of horticulture were observed within the ROW.

6.8.4.2 Recreational areas

Raglan Creek has a public access area and a boat ramp, which both appear to be heavily utilised. Construction activity, and any vegetation rehabilitation barriers that might be necessary, may have adverse short to medium-term effects on recreational use in terms of aesthetic amenity. High-visibility poly-web fencing will be used to discourage public access to these areas, during any revegetation following clearing, with appropriate signage (e.g. "revegetation area, please keep out").

GAWB's priority will be to ensure that restriction of access to the boat ramp at Raglan Creek is minimised, and that the boat ramp will be returned to its original condition or better.

While the Raglan Creek recreation area is currently degraded (there is a large amount of rubbish in the area, and partial clearing of vegetation) this does not appear to deter users. GAWB will ensure that the area is not degraded further.

There is likely to be a **negligible** to **minor adverse** impact to recreational areas in general.

6.8.5 Environmental Offsets

Environmental offsets are a mechanism that can be used in environmental management to compensate for the impacts of developments on ecologically significant features. Offsets are usually available through an environmental impact and approvals process. They are a relatively recent requirement that have been written into several Federal, State and Local Governmental policies. The Federal Government released a 'Draft Environmental Offsets Policy for the *Environment Protection and Biodiversity Conservation Act 1999'* for public consultation in August 2007 (Appendix E2). The Queensland EPA also released a draft offsets policy for review at this time. This has now been made into a policy and came into effect on 1 July 2008. Currently there are three 'specific-issues offsets policies' that sit under the Queensland Government Environmental Offset Policy, these are focussed on remnant vegetation, fisheries and koalas. Other policies are planned for the near future and will include a 'Biodiversity Offsets Policy'. This may be relevant to the project at the time when approvals for operational works are sought, but at this stage the implications of such a policy is not known. Certainly, the offsetting initiative has been in operation prior to the release of the Queensland Government Environmental Offsets Policy and is regularly used to ameliorate impacts of clearing and habitat destruction. The following represents a description of clearing impacts that currently are not obligatory to offset, but may be considered under the pending Federal or State offset policies:

- Approximately 0.6 ha (based on 30 m wide x 200 m long) of low-growing Brigalow immediately south of Inkerman Creek. The stunted Brigalow does not feature on RE mapping, but could possibly be classified as RE 11.3.1 (Endangered), depending on interpretation by EPA. A suitable offset area could be negotiated with the property owner, since the cleared area of the ROW would become useable as pastoral land
- Trenching at Marble Creek will be restricted in width to a maximum of approximately 10 m. The width of the vegetation is approximately 30 m from bank to bank (based on the outer drip-line of the trees). This would result in a maximum area of disturbance of 300 m^2. Bank vegetation may need to be rehabilitated either on the ROW or outside of the corridor. The riverine scrub vegetation is too narrow to feature on RE mapping, but would normally be classified as RE 11.3.11 (Endangered). A suitable offset area further upstream could be negotiated with the landowner, probably without any net loss in agricultural productivity
- Up to 60 m of the length of two tributaries of Larcom Creek (2 m x 30 m of bank vegetation) may need to be rehabilitated either on the ROW, or outside of the corridor. The riverine vegetation is too narrow to feature on RE mapping, but would normally be classified as RE 11.3.25 (Not Of Concern). A suitable offset area further upstream could be negotiated with the landowner, probably without any net loss in agricultural productivity. Larcom Creek is proposed to be crossed by underground boring, so its fringing vegetation will not be affected
- Approximately 2.7 ha of Ironbark, Grey Box and Spotted Gum forest (RE 11.11.4 and RE 11.11.15, both Not Of Concern) in the Aldoga area (based on 30 m wide x 900 m long). A suitable offset area could be negotiated with the landowners, since the cleared area of the ROW could be utilised as accessible and productive pastoral land, and there are currently disused areas in need of rehabilitation
- Approximately 10.5 ha of Spotted Gum and Ironbark forest (RE 12.11.6 Not Of Concern, and RE 12.11.14 Of Concern) in the Yarwun area (based on 30 m wide x 3.5 km long). The Not Of Concern component does not require offsetting under the VM Act, but the Of Concern component does. A suitable offset area could be negotiated with the landowners, since the cleared area of the ROW could be utilised as accessible and productive pastoral land, and there are currently disused areas in need of rehabilitation.

In Queensland, the VM Act is associated with one of the specific issues offsets policies and is administered by DNRW (Appendix E2). The offsets policy allows some areas of remnant vegetation to be cleared for relevant purposes, providing an ecologically equivalent[6] area can be obtained and protected indefinitely elsewhere. The offsets policy can assist to address elements of the assessment code related to Endangered REs, Of Concern REs, threshold REs[7], wetlands, waterways and areas of essential habitat. An offset must be able to satisfy the following criteria:

- It must not be currently protected (i.e. mapped as remnant vegetation, within conservation reserve or protected as a condition of another development approval)
- It must have the same RE or at least have the same conservation status as the area proposed for clearing
- It must be a minimum of 2 ha or capable of being mapped by DNRW as remnant vegetation
- It must demonstrate ecological equivalence
- It must be capable of achieving remnant status within 20 years (maximum).

It is also required that the proponent legally secure the offset, so that the vegetation is protected in perpetuity, and provide DNRW with a copy of a management plan that details how the offset will be managed to achieve remnant status.

Based on the assessment of impacts vegetation offsets may be necessary for the following areas, if they are cleared or significantly disturbed:

- Up to approximately 1.3 ha (nominally 30 m wide x 430 m long) of mangroves (RE 11.1.4 Not Of Concern) at Raglan Creek. The offset ratio will be 1:2 or 1:3 depending on ecological equivalence factors
- Approximately 7.5 ha of Grey Box forest (RE 11.3.26, Not Of Concern) in the Dart Creek to Mt Larcom area. This is based on the following lengths of ROW at 30 m wide. The offset ration will be 1:2 or 1:3 depending on ecological equivalence factors:
  - 670 m at Site 22a (x 30 m = 2 ha)
  - 80 m of minor remnant between Sites 22a and 23 (x 30 m = 0.24 ha)
  - 780 m at Site 23 (x 30 m = 2.3 ha)
  - 500 m at Site 26 (x 30 m = 1.5 ha of partly cleared remnant). Undisturbed remnant equivalent probably about 1 ha
  - 1,000 m at Site 27 (x 30 m = 3 ha of partly cleared remnant). Undisturbed remnant equivalent probably about 1.5 ha.
- A small amount (approximately 0.5 ha) of Blue Gum (RE 11.3.4 Of Concern) in the Aldoga area. The offset ration will be 1:2 or 1:3 depending on ecological equivalence factors. A suitable offset area could be negotiated with the landowners, since the cleared area of the ROW could be utilised as accessible and productive pastoral land, and there are currently disused areas in need of rehabilitation
- Approximately 10.5 ha of Spotted Gum and Ironbark forest (RE 12.11.6 Not Of Concern, and RE 12.11.14 Of Concern) in the Yarwun area (based on 30 m wide x 3.5 km long). The Not Of Concern component does not require offsetting under the VM Act, but the Of Concern component does. The offset ration will be 1:1 or 1:2.5 depending on ecological equivalence factors. A suitable offset area could be negotiated with the landowners, since the cleared area of the ROW could be utilised as accessible and productive pastoral land, and there are currently disused areas in need of rehabilitation.

The arrangements for offsets would be finalised following successful completion of the EIS process and in the context of vegetation clearing applications under the VM Act.

[6] Ecological equivalence is measured by considering the following factors: location (proximity to clearing), strategic position (e.g. corridor, core habitat), area, vegetation community, vegetation condition (e.g. species diversity, weed invasion), regaining remnant status (e.g. stage of regrowth) and landscape context attributes (i.e. how it fits ecologically within locality).

[7] Threshold REs are those that are close to changing status (e.g. Of Concern to Endangered) because their total remnant percentage is close to the threshold of two different conservation status levels.

6.9 Cumulative and Interactive Impacts

The ROW is part of a larger corridor which will accommodate more services in the form of pipelines or cables. GAWB does not have control over these future additional services, and their potential impacts.

It is considered unlikely that impacts on Rare and Threatened flora species will accumulate over time due to additional services being installed. The corridor has been investigated as part of this assessment, and significant new findings are unlikely.

The key problems introduced by the installation of additional services are likely to be:

- Clearing of more vegetation in the form of another ROW, effectively widening the cleared part of the corridor. This will reduce remnant sizes and increase remnant fragmentation
- Introduction of more weeds, either in terms of quantity, or diversity, because of increased activity from construction and subsequent maintenance.

Many of the environmental pressures generated by subsequent services may be greater than the current proposed project because they may occur during the rehabilitation period of this project, when damage could occur more easily to replanted areas. It is beyond the scope of this chapter to assess the cumulative impacts of these subsequent ROWs, but it is recommended that this report be used as a key source of baseline information, and as a guide to further impacts. EMPs developed by other parties for additional services should be aware of the existing EMP proposed by this chapter, so that management practices are coordinated between service operators. For example, a weed management plan including measures such as vehicle inspection and wash down should be coordinated to increase effectiveness, particularly in areas infested by Parthenium and Giant Rats-tail Grass. Chapter 11, Waste, addresses the spread of weeds through testing, operations and maintenance.

6.10 Summary and Conclusions

The construction of the pipeline and clearing of the ROW is likely to have an overall **negligible** to **minor adverse** impact. A trained ecologist will conduct a walkover of the ROW to identify areas where negative impacts on flora communities (in general) and Threatened species are possible. This will occur during pre-construction and this information will be documented in the Construction EMP.

Occasional traffic and other activity that could potentially disturb vegetation are likely to occur infrequently in the ROW during the operational phase of this project. There may be ongoing monitoring of vegetation rehabilitation, and a weed management plan will be implemented. EMPs have been proposed which address these issues.

A summary of key impacts and mitigation measures is shown in Table 6.14.

Table 6.14 Summary of Key Impacts and Mitigation Measures

Refer to key at foot of table for terminology and codes.

EIS Area: Ecology **Feature/Activity**	**Current value + Substitutable Y:N**	**Description of impact**		
		Description in words	Mitigation inherent in design/standard practice mitigation	Residual impact using Significance Criteria
Possibly an Endangered Ecological Community (Commonwealth EPBC Act) Also possibly Endangered RE (State NC Act)	Natural ecosystems; Wildlife habitat Not substitutable	Clearing of 0.69 ha of possibly Endangered RE, depending on interpretation by EPA. Stunted Brigalow south of Inkerman Creek	Minimise clearing by adjusting location and width of ROW. Possible provision of offset, or rehabilitation of adjacent area if necessary, depending on requirements of vegetation clearing permit under the VM Act	Negligible to Minor –ve, D, T, MT
Endangered RE (State NC Act) Also possibly an Endangered ecological community (Commonwealth EPBC Act)	Natural ecosystems; Wildlife habitat Not substitutable	Slight possibility of need to clear 350 m^2 (10 m wide trench) through unmapped Endangered RE along creek bank (Marble Creek)	Minimise clearing by adjusting location and width of ROW. Possible provision of offset, or rehabilitation of adjacent area if necessary, depending on requirements of vegetation clearing permit under the VM Act	Negligible to Minor –ve, D, T, MT
Of Concern REs (State NC Act)	Natural ecosystems; Wildlife habitat Not substitutable	Clearing approximately 12 ha of Of Concern RE in the Yarwun area. Also approximately 0.5 ha in the Aldoga area	Minimise clearing by adjusting location and width of ROW. Possible provision of offset, or rehabilitation of adjacent area if necessary, depending on requirements of vegetation clearing permit under the VM Act	Negligible to Minor –ve, D, T, MT
Not Of Concern REs (State NC Act)	Natural ecosystems; Wildlife habitat; Biodiversity Not substitutable	Clearing of approximately 8 ha of Not Of Concern RE	Minimise clearing by adjusting location and width ROW, avoiding trees, and supervising clearing. Rehabilitation planting where possible.	Negligible to Minor –ve, D, T, MT
Clearing of remnant vegetation	Wildlife corridors. Not substitutable in short term	Clearing of approximately 8 ha of remnant vegetation as above	Minimise clearing by adjusting location and width ROW, avoiding trees, and supervising clearing. Rehabilitation planting where possible.	Negligible to Minor –ve, D, T, MT
Clearing of remnant vegetation	Visual amenity. Not substitutable in short term	Clearing of approximately 8 ha of remnant vegetation as above	Minimise clearing by adjusting location and width ROW, avoiding trees, and supervising clearing. Rehabilitation planting where possible.	Negligible to Minor –ve, D, T, MT
Clearing of remnant vegetation	Weed-free ecosystems. Substitutable	Possible introduction or increase in weeds along the ROW	Weed Management practices during clearing and during pipeline trenching and backfilling	Negligible to Minor –ve, D, T, MT
Clearing of remnant vegetation	EPBC Threatened species, and NC Act Rare and Threatened species. Not substitutable	Clearing of critical sections of remnant vegetation, or unsupervised removal of individual plants	Using the environmental officer to inspect the finalised ROW for EVR species, and to supervise clearing. Translocate EVR species if encountered, with a permit from EPA.	Negligible to Minor –ve, D, T, MT

EIS Area: Ecology Feature/Activity	Current value + Substitutable Y:N	Description of impact		
		Description in words	Mitigation inherent in design/standard practice mitigation	Residual impact using Significance Criteria
Trenching through minor creek tributaries with fringing forest	Natural ecosystems; Wildlife habitat Not substitutable	Clearing of 10 to 30 m of each of two unmapped minor tributaries of Larcom Creek	Minimise clearing by adjusting location and width of ROW. Provision of offset, or rehabilitation of adjacent area	Negligible to Minor –ve, D, T, MT
Trenching through wetlands or creek beds	Natural ecosystems; Wildlife habitat. Substitutable	Excavation of sections of wetland vegetation, and possible resulting erosion and turbidity	Optimise and minimise time taken to do pipeline trenching and backfilling, so as to prevent erosion and turbidity	Negligible to Minor –ve, D, T, ST
Trenching through wetlands or creek beds	Weed-free ecosystems. Substitutable	Possible introduction or increase in weeds	Hygiene practices during pipeline trenching and backfilling	Negligible to Minor –ve, I, T, ST

Key:
Significance Criteria: Major, High, Moderate, Minor, Negligible
+ve = positive; –ve =negative impacts
D = direct; I =indirect
C = cumulative; P = permanent; T = temporary
ST = short-term; MT = medium-term; LT = long-term.

Relative Duration of Environmental Effects
Temporary: Up to one year
Short-term: From one to seven years
Medium-term: From seven to 20 years
Long-term: From 20 to 50 years
Permanent: Period in excess of 50 years.

6.11 References

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(Footnotes)

1 +/- means 'with / without'.

11.5 Appendix F - Fee Waiver Request

DELIVERING FOR QUEENSLAND | Queensland Government

Office of the
Coordinator-General

Our ref: DGBN25/499

3 September 2025

Mr Trent Williams
Gladstone Area Water Board
EEPL Approvals Manager
twilliams@gawb.qld.gov.au

Dear Mr Williams

AP2025/008 – Fee Waiver Request – SDA application for a material change of use for a utility installation (relocation of treated water pipeline) in the Gladstone State Development Area (SDA)

Thank you for your email of 19 August 2025 requesting a waiver of part of the relevant fee for an SDA application for a material change of use for a utility installation (relocation of treated water pipeline) in the Gladstone SDA.

In accordance with the Overview of fees for the Office of the Coordinator-General – July 2025 (the Guideline), the Coordinator-General has approved your request for a partial fee waiver of the relevant fee. The fee payable is $5,000 (GST exempt) and is to be paid in order for your SDA application to be properly made.

The waiver is valid for six months from the date of this letter, despite any future variations to the fees as listed in the Guideline.

The Coordinator-General reserves the right to recover costs up to the maximum of the original relevant fee if additional costs are incurred by the Coordinator-General to assess the SDA application.

If you require any further information, please contact Ms Rachel Ritchie, Senior Planner, Office of the Coordinator-General at rachel.ritchie@coordinatorgeneral.qld.gov.au or on (07) 3522 8586, who will be pleased to assist.

Yours sincerely

Steffen Poetzsch
A/Assistant Coordinator-General
Industry and Infrastructure Development
(as delegate of the Coordinator-General)

1 William Street
Brisbane Queensland 4000
PO Box 15517
City East Queensland 4002
Telephone 13 QGOV (13 74 68)
Website www.statedevelopment.qld.gov.au
ABN 29 230 178 530

11.6 Appendix F - Database searches

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 18-Aug-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	36
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	15
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
MAMMAL		
[Dasyurus hallucatus](#) Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
PLANT		
[Atalaya collina](#) Yarwun Whitewood [55417]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat known to occur within area
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat known to occur within area
Cycas megacarpa [55794]	Endangered	Species or species habitat likely to occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Parsonsia larcomensis Mt Larcom Silk Pod [64587]	Vulnerable	Species or species habitat may occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Denisonia maculata		
Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli		
Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Hemiaspis damelii		
Grey Snake [1179]	Endangered	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		
Crocodylus porosus		
Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat may occur within area
[Pterodroma cervicalis](#) White-necked Petrel [59642]		Species or species habitat may occur within area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area
Reptile		
[Crocodylus porosus](#) Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
CQ-H2 Hydrogen Transport Facility (HTF) Project	2024/09901		Assessment
CQ-H2 Surplus Industrial Water Pipeline (SIWP) Project	2024/09935		Assessment
Powerlink Gladstone to Larcom Creek 275kV Transmission Line	2003/1229		Completed
Controlled action			
Blackwater to Gladstone Gas Pipeline Project	2011/6034	Controlled Action	Completed
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval
Development of the Yarwun Coal Terminal	2012/6348	Controlled Action	Completed
Gas Pipeline with Alternative Pipleine to Supply Natural Gas Liquefaction Park	2008/4096	Controlled Action	Post-Approval
install & operate gas pipeline	2005/2059	Controlled Action	Post-Approval
Nickel and cobalt laterite mine, High-pressure acid leach plant, slurry pipeline	2005/2257	Controlled Action	Completed
Queensland Curtis LNG Project - Pipeline Network	2008/4399	Controlled Action	Post-Approval
Not controlled action			

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Moura Link - Aldoga Rail Project	2007/3773	Not Controlled Action	Completed
Rail deviation including construction of 2 new rail lines	2009/4884	Not Controlled Action	Completed
Referral decision			
Gas Transmission Pipeline to supply Natural Gas Liquefaction Park	2008/4061	Referral Decision	Completed

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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11.7 Appendix G - Bushfire Management and Mitigation Plan

Gladstone Area Water Board

Bushfire Management and Mitigation Management Plan

DATE OF ISSUE:	November 2025
MAINTAINED BY:	Position of Document Owner
CURRENT VERSION:	Version 1
REVIEW DATE:	12 months from 'Date of Issue'
DOCUMENT TYPE	Management Plan

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Gladstone Area Water Board

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1. INTRODUCTION

The Bushfire Management Sub-Plan (BMP) is one component of the GAWB Construction Environmental Management Plan (CEMP) for the East End Pipeline Project (hereafter referred to as "the Project"). Section 4.1 of the CEMP provides further background and detailed description of the Project.

The BMP describes how bushfires will be managed and any potential impact minimised during construction. This BMP has been prepared with consideration of Project requirements, and to address the legal and other requirements outlined in Section 3

1.1 Plan purpose

The purpose of this BMP is to:

- Describe how GAWB and its contractor(s) will manage and control risks associated with bushfires during the construction of the Project
- Provide strategies to control potential impacts of bushfires during construction
- Address the requirements of applicable legislation
- Address approval, permit/licence and contractual requirements.

1.2 Management objective and performance criteria

Objectives and performance criteria for the Project in relation to bushfires include the following:

Objectives	**Performance Criteria**
• To provide a strategic and systematic framework to enable construction of the project with minimal environmental or social impact due to bushfires • To ensure all construction activities are undertaken with the objective of preventing such impacts	• No uncontrolled bushfires caused by GAWB or its contractors • No loss of protected or native fauna and flora due to uncontrolled bushfires caused by GAWB or its contractors • No damage to property, plant or equipment resulting in delays to the Project due to uncontrolled bushfire

1.3 Plan Scope

This plan applies to all works associated with the Project.

1.4 Interface with other documents

This BMP forms part of the overall CEMP for the Project.

2. LEGAL ANDOTHER COMPLIANCE REQUIREMENTS

2.1 Relevant legislation

- *Environmental Protection Act 1994*
- *Environmental Protection and Biodiversity Conservation Act 1999*
- *Fire and Emergency Services Act 1990*

2.2 Australian Standard and Industry guidelines

- Gladstone Regional Council - Local Disaster Management Plan
- Permits, approvals and licence conditions
- Landowners' requirements
- MCU development permits
- Operational works development permits

3. CONTEXT

3.1 Key risks

Where work is in and around native bushland and grasslands, fuel/fuel load of any type there is a potential risk of bushfire/fire. A robust understanding of bushfire risk is vital to minimising its potential impact and increasing resilience in the Region. By considering a range of factors, including wind, ecology, topography, climate, bushfire prone area mapping, fuel load, fire history and community consequence.

Under the Gladstone Regional Council Planning Scheme, the project predominately passes through high and medium bush fire hazard areas.

Road Centrelines

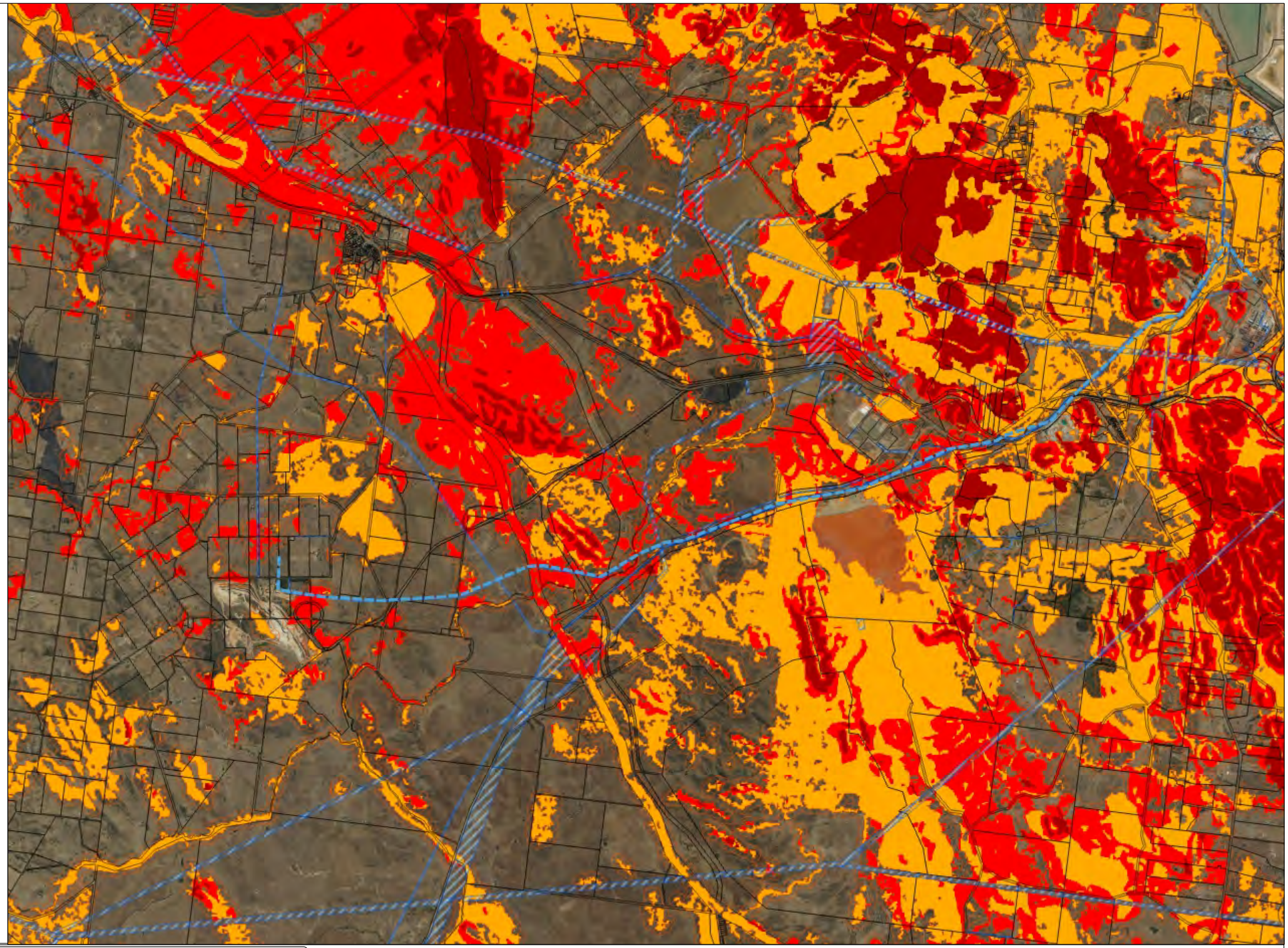
Easement

Base Parcel

Base Point

Bushfire Prone Areas

- Very High Potential Bushfire Intensity
- High Potential Bushfire Intensity
- Medium Potential Bushfire Intensity
- Potential Impact Buffer



GLADSTONE REGIONAL COUNCIL

Map Title

1,891.35 0 945.68 1,891.35 Meters

Printed: 25-Nov-2024

Map Scale 1: 75,654

Original Size: A3

3.1.1 *Risk assessment process*

Due to the inherent nature and seasonal variability of bushfire hazards, bushfire risks shall be incorporated into the Project Risk Register. The risk assessment will consider:

- BOM and Bushfire CRC seasonal and daily predictions
- Existing and predicted fire danger ratings / predicted fuel loads
- Fire history
- Geographic location of project works and local knowledge
- QFRS and other relevant agency advice and recommendations; and
- Status of the project and project activities.

3.1.2 *Risk controls*

Bushfire risk controls are specific to the particular risk, and are prioritised in the order of reduction, mitigation, and suppression activities. All risk controls shall be reviewed annually. Risk treatment shall seek to:

- Provide training to all employees/contractors on fire hazard minimisation
- eliminate all possible ignition sources
- eliminate or restrict available fuel sources
- enable a prompt and effective suppression response to an outbreak
- enable situational awareness of current circumstances (fire risk)
- encourage partnerships with adjoining landowners
- enable safer work practices aligned to Fire Danger Ratings
- consultation and engagement.

3.1.3 *Queensland Fire and Rescue Service (QFRS) and Rural Fire Brigades*

GAWB (or its contractor) will leverage the existing Fitzroy to Gladstone Pipeline's (FGP) close working relationship with the local Queensland Fire and Emergency Services (QFES) / Rural Fire Services (RFS) and Gladstone Regional Councils Disaster Management Committees in its area of operations, including:

- Conduct of emergency response exercises and joint training activities
- consideration of resource support
- corridor and rollingstock familiarisation
- operational communication protocols
- participate in ongoing liaison with Queensland Fire and Emergency Services (QFES) / RFS, including
- membership of appropriate consultative groups and committees
- providing location information regarding the corridor
- providing location of corridor access roads
- providing location of staging areas
- provision of local knowledge for inclusion in CEMP
- review of emergency response plans and procedures
- sharing of fire risk intelligence.

3.1.4 *Emergency Contact list*

Up to-date emergency contact list shall be compiled and maintained for owners and occupiers of all properties adjoining the EEPL site enabling relevant stakeholders to be contacted and advised of any bushfire related activity, threat, or issues.

3.1.5 *Accessibility*

GAWB acknowledges that access to a bushfire is critical in successfully combating the bushfire and its impact. The Contractor, in coordination will aid the QFES and RFS in gaining access to bushfire by providing up-to-date maps and locations of:

- Site access gates and roads
- Signed staging areas

3.1.6 *Fire suppression equipment*

The GAWB engaged principal contractor will provide and maintain in operational condition the following fire suppression equipment for use in fire suppression activities, which will be compatible with QFES and RFS:

- Fire extinguishers (appropriate to the hazard)
- Water Tankers (can be used for dust control and firefighting).

4. ROLES, RESPONSIBILITIES AND AUTHORITIES

All site personnel are responsible to ensure that they minimise environmental nuisance or harm by adherence to all Project Management Plans and other documentation. Site personnel are also responsible for ensuring they do not act in contravention of any Environmental Approval or the Contract. Field Supervisors are responsible for implementation and maintenance of mitigation measures outlined in the BMP for all activities or work areas under their control.

The Environmental Manager is responsible for routine surveillance and monitoring, communication of requirements of this Sub-plan, coordination of visual monitoring, and all other responsibilities related to bushfire management identified within this Sub-plan and overall CEMP. Importantly the Environmental Manager is responsible for the immediate notification of State and/or Commonwealth government authorities of impacts that have mandatory reporting requirements

The Construction Director is responsible for overseeing implementation of this Sub-plan and overall CEMP.

5. IMPLEMENTATION STRATEGY

5.1 Mitigation and Management Actions

The Table below outlines the mitigation and management measures to be carried out to ensure the Project meets all necessary requirements.

Reference	Mitigation and Management Action	Timeframe/s	Responsibility
01	Intent of this sub-plan will be communicated through the Site Induction process, to ensure all site personnel are aware and take ownership of sub-plan requirements relating to this element	Prior to construction	Construction Director
02	Requirements relating to this sub-plan to be revisited frequently (during the induction, site mobilisation and high-risk days such as extreme heat waves) through Toolbox and Prestart meetings	During construction	Environment Team
03	Fire risks will be assessed for each work area prior to works commencing	During construction	Safety Team Superintendent Supervisors
04	Work areas will have adequate road access for emergency vehicles and evacuation.	During construction	Superintendent Supervisors

05	An adequate and accessible water supply will be provided for firefighting purposes. Water will be supplied from local councils, dams and licenced bores in remote locations. It will be stored in dams, water trucks and small mobile firefighting trailers.	During construction	Superintendent Supervisors
06	Fire breaks will be developed to provide setbacks between buildings/structures and hazardous vegetation, and provide access for emergency vehicles	During construction	Superintendent Supervisors
07	Hot works to be undertaken as per requirements of Hot Works Permits.	During construction	Superintendent Supervisors Safety Team Engineers
08	Fire breaks shall be checked regularly and maintained as necessary.	During construction	Superintendent Supervisors
09	Bushfire response methods and evacuation plans will be included in the Emergency Response Plan.	During construction	Safety Team Superintendent
10	Electrical cables will be kept in good condition	During construction	Superintendent Supervisors
11	Chemical and hydrocarbon storage areas will be located in areas with low bushfire potential	During construction	Superintendent Supervisors
12	Water carts on site will be suitable for use in firefighting circumstances (e.g. compatible with QFES).	During construction	Superintendent Supervisors
13	Smoking will not be permitted outside of designated smoking areas.	During construction	All Persons
14	Any stockpiles of vegetation to be used as mulch will be kept moist to prevent outbreak of fire.	During construction	Superintendent Supervisors
15	All site vehicles and access areas will contain a fire extinguisher	During construction	All Persons
16	No intentional fires or wood fired barbeques will be permitted.	During construction	All Persons

6. PERFORMANCE EVALUATION

6.1 Monitoring

General inspections and auditing will be undertaken in accordance with Section 8 of the CEMP. The Environmental Team will undertake environmental inspections to develop and evaluate the effectiveness of environmental controls. This will include:

Monitoring action	Record	Frequency	Responsibility
Routine daily visual observance by all personnel during construction to monitor the site.	Daily Visual Inspection	Daily	Environmental Manager
Weekly inspections using the Weekly Environmental Checklist.	Weekly Environmental Checklist Report	Daily	Site Supervisor
Monthly reporting will be recorded through Project Monthly Reports.	Monthly Report submitted to GAWB	Monthly	Environmental Manager

Regular inspections will be undertaken in relation to bushfires and include the following:

- Effectiveness of the mitigation measures
- Any environmental incidents, hazards or near-misses documented in relation to bushfire management
- Community complaints in relation to bushfire management, and the construction contractor's response
- Bushfire management objectives and tracking against these.

7. REVIEW AND IMPROVEMENT

7.1 Reporting

The Environmental Weekly Checklist, monthly reporting and annual independent audits undertaken throughout the construction phase of the project will be documented and kept on record by the Environmental Manager or their delegate for the duration of the Project.

In the event of a complaint, non-compliance or incident, an investigation will be undertaken to determine the cause of the problem and will be led by the Construction Director. Any identified impacts on bushfire management.

8. DOCUMENT UPDATES

The Site Environmental Management Representative will amend, update, and continue to develop and improve this BMP on an ongoing as the construction program progresses and continual improvement opportunities are identified.